BOSTON UNIVERSITY

Boston University College of Engineering
Department of Biomedical Engineering

2023 BIOMEDICAL ENGINEERING SENIOR DESIGN PROJECTS CONFERENCE

38TH ANNUAL

May 5, 2023 Boston University Photonics Center

BOSTON UNIVERSITY

Boston University College of Engineering
Department of Biomedical Engineering

Biomedical Engineering

2023

38th Annual
Senior Design Projects 2023

Department of Biomedical Engineering
Boston University College of Engineering
Conference Friday May 5, 2023

John A. White
Professor and Chair,
Department of Biomedical Engineering

Diane Joseph-McCarthy
Executive Director, BTEC
Professor of the Practice, BME

Darren Roblyer
Associate Professor, BME

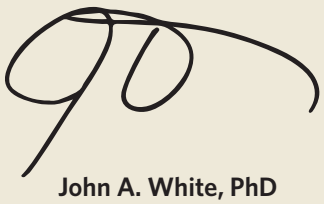
WELCOME FROM THE CHAIR

It is my great pleasure to welcome our guests, our alumni, our industry representatives, our faculty and our students to **Boston University's 38th Annual Biomedical Engineering Senior Design Projects Conference**. This conference is an annual rite of passage for all BU BME seniors, and culminates our year-long Senior Design Project Program. Our Senior Design program is recognized as a national model for the capstone independent design and communication experience for BME undergraduates. Over the course of the day, our talented students will present their innovative designs through oral presentations, as they complete their BS degrees from one of the top Biomedical Engineering programs.

Biomedical Engineering synthesizes engineering, computation, math and physical sciences with the life sciences to advance our understanding of biology, physiology and the medical sciences. This knowledge is then leveraged to develop new devices and methods to improve healthcare, and accelerate cutting-edge research. Our ABET-accredited BS degree program in Biomedical Engineering is one of the oldest such programs in the country, and is designed to provide integrated training in life, physical, and engineering sciences as preparation for a variety of careers in bioengineering, applied biotechnology, and medicine. Engineering design is woven through each year of our curriculum. Earlier design courses complement the senior design experience and help us train the future leaders and innovators in biomedical engineering.

This year's senior design project program was directed by Professors **Diane Joseph-McCarthy** and **Darren Roblyer**. This team invested much energy and organizational skills to sustain the level of excellence and impact for which this program is renowned. They were assisted by a very talented team of technical advisors from Boston University, BU Medical and Dental Schools, the Harvard hospitals, and medtech, pharma, and biotech industries. These technical advisors met regularly with their teams to guide the work, and grade and comment on assignments including proposal drafts, progress reports, and oral presentations. Their efforts helped ensure that the program continues to sustain its high level of distinction. I served as part of this team and was fortunate to enjoy the program in all of its dimensions. We were able to increase our enagement with industry partners, including sponsors of the new Bioengineering Technology & Entrepreneurship Center (BTEC) at BU. Many students utilized the state-of-the-art BTEC facilities to carry out their design and experimentation. Interactions with industry were facilitated with the help of BU's General Counsel, Martin Oppenheimer. I also want to acknowledge the assistance of David Shawn, Adam Kane, and Arielle Kaplan from the BU Writing Program, as well as the guest lecturers who educated students on topics ranging from professional development to intellectual property to entrepreneurship and regulatory affairs. Finally, a very special thank you to John Benducci for his sustained support of the Senior Design Program this year.

Our students are remarkable at rising to the challenge, and I have no doubt that their presentations today will impress, inform and entertain you. Enjoy!



John A. White, PhD
Professor and Chair, Department of Biomedical Engineering

Primary Faculty

IRVING J. BIGIO

Professor, Biomedical Engineering;
Electrical and Computer Engineering; Physics; Medicine

PhD, Physics, University of Michigan

Medical applications of optics, lasers and spectroscopy; biomedical optics and biophotonics; biomolecular dynamics; applied spectroscopy, especially to biomedical problems; nonlinear optics; quantum electronics and laser physics.

DAVID BOAS

Professor, Biomedical Engineering;
Electrical and Computer Engineering;
Director, Neurophotonics Center

PhD, Physics, University of Pennsylvania

Neurophotonics; biomedical optics; functional near infrared spectroscopy; microscopy methods; oxygen delivery and consumption; neuro-vascular coupling; physiological modeling.

CHRISTOPHER S. CHEN

Professor, Biomedical Engineering;
Director, Biological Design Center

MD, Harvard University; *PhD, Medical Engineering, MIT*

My laboratory seeks to understand how cells interact with their environment, and to use this knowledge to control cell function. In particular, we are studying the cooperation between adhesive, mechanical and biochemical signaling in the regulation of angiogenesis and stem cell biology.

JI-XIN CHENG

Professor, Biomedical Engineering;
Electrical and Computer Engineering; Chemistry; Physics;
Moustakas Chair Professor in Photonics and Optoelectronics

PhD, Chemical Physics, University of Science and Technology of China

Molecular spectroscopic imaging technologies; label-free microscopy; medical photonics; neurophotonics; cancer metabolism; photonics for infectious diseases.

BRIANNE CONNIZZO

Assistant Professor, Biomedical Engineering

PhD, Bioengineering, University of Pennsylvania

Aging, orthopaedic and soft tissues, mechanobiology, multiscale biomechanics, extracellular matrix assembly and remodeling.

EDWARD DAMIANO

Professor, Biomedical Engineering

PhD, Applied Mechanics, RPI

Integrated cellular and extracellular biomechanics; biofluid dynamics; microhemofluidics; microcirculation; vestibular biomechanics; non-Newtonian rheology; closed-loop blood-glucose regulation.

CHARLES DELISI

Metcalf Professor of Science and Engineering;
Dean Emeritus, College of Engineering

PhD, Physics, New York University

Developing and applying computational/mathematical methods, and high throughput experimental methods for inferring the structure and function of protein networks.

BRIAN DEPASQUALE

Assistant Professor, Biomedical Engineering

PhD, Neurobiology and Behavior, Columbia University

Machine learning, computational neuroscience, theoretical neuroscience.

ANNA DEVOR

Associate Professor, Biomedical Engineering

PhD, Hebrew University of Jerusalem, Israel

Cellular and systems-level neuroscience, microscopy, physiological underpinning of noninvasive imaging.

MARY DUNLOP

Associate Professor, Biomedical Engineering

PhD, Mechanical Engineering,
California Institute of Technology

Understanding how microorganisms use feedback to respond to changes in their environment, studying naturally occurring examples of feedback to understand their implications for survival in changing conditions, and engineering novel, synthetic feedback control systems.

MICHAEL ECONOMO

Assistant Professor, Biomedical Engineering

PhD, Biomedical Engineering, Boston University

Systems neuroscience, motor control, long-range neural circuits, computational neuroscience, neurotechnology.

SOLOMON EISENBERG

Professor, Biomedical Engineering;
Electrical and Computer Engineering;
Senior Associate Dean for Academic Programs,
College of Engineering

ScD, Electrical Engineering, MIT

Electrically mediated phenomena in tissues and biopolymers; cartilage biomechanics; computational modeling of electric field distributions in the human thorax and heart during defibrillation; transcranial magnetic stimulation.

JAMES GALAGAN

Professor, Biomedical Engineering;
Microbiology, BUSM

PhD, Computational Neuroscience, MIT

Biosensor Development, Computational Biology, Systems Biology, Genomics.

ALEXANDER GREEN

Assistant Professor, Biomedical Engineering

PhD, Materials Science and Engineering, Northwestern University

Synthetic biology, nucleic acid nanotechnology, low-cost diagnostics, nanomaterials.

MARK GRINSTAFF

Professor, Biomedical Engineering; Chemistry;
Director, Nanotechnology Innovation Center

PhD, Chemistry, University of Illinois Urbana-Champaign

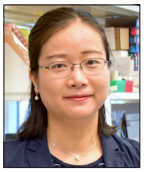
Biomaterials; tissue engineering; drug delivery; macromolecular chemistry and engineering, self-assembly; nanodevices.

XUE HAN

Professor, Biomedical Engineering

PhD, Physiology, University of Wisconsin-Madison

Neurotechnology; optical neural modulation; optogenetics; neural prosthetics; neural network dynamics; brain rhythms; neurological and psychiatric diseases; cognition.



LIANGLIANG HAO

Assistant Professor, Biomedical Engineering

PhD, Chemical Biology, Northwestern University

Noninvasive disease detection and treatment monitoring at the Point-of-Care, tissue-specific transcriptome engineering, and multimodal systemic imaging

Primary Faculty Cont.

DIANE JOSEPH-MCCARTHY
Professor of the Practice,
Biomedical Engineering;
Executive Director, Bioengineering Technology & Entrepreneurship Center
PhD, Physical Chemistry, MIT

Chemical Biology, Biophysics, Computational Science, Drug Discovery & Development.

SIMON KASIF
Professor, Biomedical Engineering
PhD, Computer Science,
University of Maryland

Genomic systems biology, P4 medicine, wellness and disease prevention, medical bioinformatics, artificial intelligence, machine learning, high performance systems, reproducibility and science informatics.

AHMAD (MO) KHALIL
Associate Professor, Biomedical Engineering;
Associate Director, Biological Design Center
PhD, Mechanical Engineering, MIT

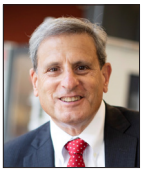
Synthetic & systems biology; gene regulation; protein aggregation; microbial communities; laboratory evolution.

CATHERINE KLAPPERICH
Professor, Biomedical Engineering;
Director, Precision Diagnostics Center;
PhD, Mechanical Engineering,
University of California, Berkeley

Design of new molecular diagnostics and appropriate technologies for healthcare.

LAURA LEWIS
Assistant Professor, Biomedical Engineering;
PhD, Neuroscience,
Massachusetts Institute of Technology

Brain imaging; neural dynamics; computational neuroscience and signal processing; neural circuits underlying sleep and attention; decoding and predicting brain activity; neurovascular coupling; psychiatric and neurodegenerative disorders.



KENNETH R. LUTCHEN
Professor, Biomedical Engineering;
Dean, College of Engineering
PhD, Biomedical Engineering, Case Western

Airway and lung tissue mechanics and ventilation; Computational modeling of structure-function relations in the lung; Mechanical ventilation; Integrated biomechanics of the lung; linear and nonlinear systems identification; blood-glucose regulation.

JEROME MERTZ
Professor, Biomedical Engineering; Physics
PhD, Physics, Université Paris VI and
University of California, Santa Barbara

Development and application of new optical microscopy techniques to biological imaging.

JOHN NGO
Assistant Professor, Biomedical Engineering
PhD, Biochemistry and Molecular Biophysics,
California Institute of Technology

Protein structure and engineering; molecular and cellular engineering; single-molecule biophysics; cell signaling; fluorescence and electron microscopy.

HADI T. NIA
Assistant Professor, Biomedical Engineering
PhD, Mechanical Engineering, MIT

Tumor microenvironment; physical sciences of cancer; intravital imaging and animal models of cancer; mechanobiology and biomechanics.

TIMOTHY O'SHEA
Assistant Professor, Biomedical Engineering
PhD, Medical Engineering and Medical Physics, MIT

Glia Engineering, Biomaterials, Neural Engineering, Spinal Cord Injury, Stroke, Glial neurobiology, regenerative medicine, cell transplantation.

ERICA D. PRATT
Assistant Professor, Biomedical Engineering
PhD, Biomedical Engineering, Cornell University

Engineering-focused cancer research, Liquid biopsy and rare cell detection, Multi-Omics in oncology, Microfluidics and microfabrication, Pancreatic Cancer

DARREN ROBLYER
Associate Professor, Biomedical Engineering
Director of PhD Program Admissions
PhD, Bioengineering, Rice University

Optical functional imaging; diffuse optics; near infrared spectroscopy; monitoring of emerging targeted and cytotoxic therapies in oncology; non-invasive monitoring of tumor metabolism.

KAMAL SEN
Associate Professor, Biomedical Engineering
Director of Master's Program Admissions
PhD, Physics, Brandeis University

Electrophysiological recording of neural responses in auditory processing; theoretical methods to characterize neuronal encoding; computational models of natural sound processing.

MICHAEL L. SMITH
Associate Professor, Biomedical Engineering
PhD, Biomedical Engineering,
University of Virginia

Cellular mechanotransduction through the extracellular matrix; fibronectin structural biology; and microfabricated surfaces for engineering cell function.

DIMITRIJE STAMENOVIĆ
Professor, Biomedical Engineering
PhD, Mechanics, University of Minnesota

Respiratory mechanics; cell mechanics; rheology of soft tissues; mechanics of foam-like structures.

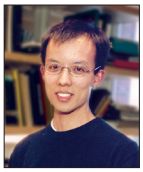
BÉLA SUKI
Professor, Biomedical Engineering
PhD, Biomechanics, Jozsef Attila University,
Szeged (Hungary)

Mechanical properties of living tissues; modeling the dynamic and nonlinear behavior of complex biological systems; pulmonary physiology.

MICHELLE TEPLENSKY
Assistant Professor, Biomedical Engineering
PhD, Chemical Engineering, University of Cambridge

Engineering nanotechnology to program immune cell connectivity, processing, and communication by design and harnessing these insights to synthesize potent vaccines and immunotherapeutics.

Primary Faculty Cont.



JOE TIEN
Associate Professor, Biomedical Engineering
PhD, Physics, Harvard University

Vascularization of biomaterials; quantitative physiology of engineered tissues; biomaterials for microsurgical applications; lymphatics; interstitial transport; inverse problems in vascular imaging.

ADRIANA TOMIC
Assistant Professor, Biomedical Engineering
PhD, Infection Biology, Hannover Medical School

At the interface between computational immunology, infection biology and clinical research, our research aims to define the immunological signature of protective immunity in infectious diseases.

LUCIA M. VAINA
Professor, Biomedical Engineering; Neurology
PhD, Mathematical Logic, Sorbonne; Doctorat d'Etat ès Sciences and in Médecine (MD PhD); Institut National Toulouse, France

Behavioral, functional imaging (fMRI and MEG) and theoretical & computational approaches to study the neural basis and the plasticity of high-level visual functions in the human brain.

SANDOR VAJDA
Professor, Biomedical Engineering;
Director, Biomolecular Engineering Research Center
PhD, Chemistry, Hungarian Academy of Science

Scientific computing applied to problems in engineering, biochemistry, and biology, with focus on molecular mechanics, protein structure determination, protein-ligand interactions, docking, and drug design.

JOHN WHITE
Professor and Chair, Biomedical Engineering
PhD, Biomedical Engineering, Johns Hopkins University

Mechanisms of episodic memory; pathophysiology of epilepsy; computational neuroscience; design of real-time instrumentation; imaging of activity in neurons and astrocytes.

JOYCE WONG
Professor, Biomedical Engineering
PhD, Materials Science and Engineering,
Program in Polymer Science and Technology, MIT

Biomaterials, tailoring cell-material interfaces for drug delivery and tissue engineering applications; direct, quantitative measurement of biological interactions.

WILSON WONG
Associate Professor, Biomedical Engineering
PhD, Chemical Engineering, UCLA

Synthetic and systems biology in immune cells.

MUHAMMAD ZAMAN
Professor and Vice Chair, Biomedical Engineering
PhD, Physical Chemistry University of Chicago

Comprehensive and quantitative approaches to develop a multiscale understanding of cell-matrix interactions for fundamental biological and applied clinical research.

Lecturers

OUSAMA M. A'AMAR
Senior Lecturer,
Biomedical Engineering
Ph.D., with Distinction, Electrical Engineering,
The National Polytechnic Institute of Lorraine (INPL), France

EK131, EK210

XIN BROWN
Senior Lecturer,
Biomedical Engineering;
Biointerface Technologies Facility Manager
PhD, Boston University School of Medicine

BE209, BE605, BE726, BE727

MARIO CABODI
Master Lecturer,
Biomedical Engineering
Director of Professional Master's Programs
PhD, Cornell University

BE694, BE695

ANDERSON (ICHUN) CHEN
Lecturer,
Biomedical Engineering;
Micro Nano Imaging Facility Manager
PhD, Applied Physics, Stevens Institute of Technology

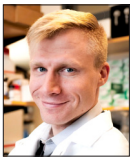
BE517

ANDY FAN
Lecturer,
Biomedical Engineering
PhD, Electrical Engineering, MIT

BE403, EK103, BE601, BE601, BE603, BE604, Mathematical Methods for Biomedical Engineering

KAVON KARROBI
Lecturer,
Biomedical Engineering
BTEC Manager
Ph.D. Biomedical Engineering, Boston University

BE492, BE465, BE466



JOSHUA KAYS
Lecturer,
Biomedical Engineering
PhD, Biomedical Engineering, Boston University

EK424 , BE/ME/MS 504, EK 481, BE 428

CHRISTINE MULVEY
Senior Lecturer,
Biomedical Engineering
PhD, Biomedical Engineering, Boston University

EK131, BE492

KENN SEBESTA
Lecturer,
Biomedical Engineering
PhD, Controls, University of Luxembourg

EK131

ALEKSANDRS ZOSULS
Instructor,
Biomedical Engineering
BS, Biomedical Engineering, Boston University

EK210, EK307, BE491, BE492

Research Faculty

ELIZABETH BARTOLAK-SUKI
Research Assistant Professor, Biomedical Engineering

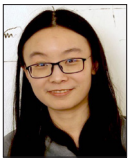
MD, General Medicine, Szent-Gyorgyi Medical School DSc, Molecular Cell biology, Semmelweis Medical School

Inter/intracellular signaling and molecular/ medical pathology.

DIMITRI BEGLOV
Research Assistant Professor, Biomedical Engineering

PhD, Molecular Biophysics, Moscow Physical and Technical Institute

Computational chemistry and biology; protein structure and function; computational characterization and prediction of biomolecular interactions.



XIAOJUN CHENG
Research Assistant Professor, Biomedical Engineering

PhD, Physics, City University of New York

Exploiting light scattering and speckles to investigate brain dynamics

AARON COLBY
Research Assistant Professor, Biomedical Engineering

PhD, Biomedical Engineering, Boston University

Developing novel delivery systems including nanoparticles and drug concentrating devices as tools for treating cancer.

AURELIE EDWARDS
Research Professor, Biomedical Engineering

PhD, Chemical Engineering, MIT

Developing mathematical models of water and solute transport in the kidney, at different scales, to address physiological and pathological questions.

JEROEN EYCKMANS
Research Assistant Professor, Biomedical Engineering

PhD, Medical Sciences, KULeuven

Tissue repair and regeneration, wound healing biomechanics, biomimetic tissue-on-chip models, skeletal organoid biology, reverse tissue engineering, fibrosis.

FERNANDO FERNANDEZ
Research Assistant Professor, Biomedical Engineering

PhD, Neuroscience, University of Calgary

Electrophysiology, biophysics and computational neuroscience; understanding the underlying mechanisms of neuronal electrical activity and its implications for synaptic integration and spike output modulation in cortical circuits.

ODED GHITZA
Research Professor, Biomedical Engineering

PhD, Electrical Engineering, Tel Aviv Univ.

Formulation of cortical computation principles that underlie the speech decoding process and that are capable of predicting human performance in speech perception tasks.

DMYTRO KOZAKOV
Research Associate Professor, Biomedical Engineering

PhD, Biomedical Engineering, Boston Univ.

Development of protein-protein and protein-ligand docking algorithms, fast and efficient scoring functions for screening large number of potential docked complexes, protein homology models suitable for docking.

NESE LORTLAR-ÜNLÜ, MD
Visiting Research Associate Professor, Biomedical Engineering

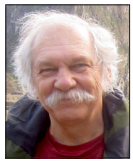
MD, Hacettepe University, Ankara, Turkey

Optical characterization and nanophotonics.

BRIAN SNYDER
Research Professor, Biomedical Engineering

MD and PhD, Biomechanics, University of Pennsylvania

Basic and applied research in musculoskeletal biomechanics, cellular processes, and gene expression.



THOMAS L. SZABO
Research Professor, Biomedical Engineering

PhD, Physics, University of Bath, UK

Medical imaging, diagnostic ultrasound, tissue characterization, transduction, biomedical signal processing, wave propagation, nonlinear acoustics.

MARTIN THUNEMANN
Research Assistant Professor, Biomedical Engineering

Eberhard-Karls-Universität Tübingen, Germany, Biochemistry, Dr. rer. nat.

Cellular and systems-level neuroscience, microscopy, electrophysiology, preclinical imaging.

ZAHID YAQOOB
Research Associate Professor, Biomedical Engineering

PhD, Optics, University of Central Florida

Label-free Interferometric Microscopy; Fluorescence Imaging; Neurophotonics; Cellular Biomechanics; Organoid Screening; Artificial Intelligence

MERYEM YUCEL
Research Associate Professor, Biomedical Engineering

PhD, Biomedical Engineering, Boğaziçi University, Istanbul, Turkey

Functional neuroimaging (fNIRS, fMRI, EEG), fNIRS signal processing, cognitive neuroscience.

Emeritus

CHARLES CANTOR, PHD
Professor Emeritus, Biomedical Engineering

crcantor@bu.edu

H. STEVEN COLBURN, PHD
Professor Emeritus, Biomedical Engineering

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EVAN EVANS, PHD
Research Professor Emeritus, Biomedical Engineering

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STEPHEN GROSSBERG, PHD
Professor Emeritus, Biomedical Engineering

steve@bu.edu

TEMPLE F. SMITH, PHD
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tsmith@bu.edu

Adjunct Faculty

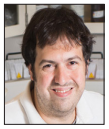
HERNAN JARA, PHD
Adjunct Associate Professor, Biomedical Engineering; Associate Professor of Radiology, BUSM

JOSEPH LEHÁR, PHD
Adjunct Research Professor, Biomedical Engineering

JULIO COLLADO VIDES, PHD
Adjunct Research Professor, Biomedical Engineering

CHRISTINE MCBETH, PHD
Adjunct Research Assistant Professor, Biomedical Engineering

Affiliated Faculty



MICHAEL ALBRO, PHD
Assistant Professor,
Mechanical Engineering

MARGRIT BETKE, PHD
Professor,
College and Grad School of Arts & Sciences,
Computer Science

THOMAS BIFANO, PHD
Professor,
Mechanical Engineering;
Materials Science & Engineering;
Director, Photonics Center

DAVID BISHOP, PHD
Professor, Electrical and Computer Engineering; Physics; Materials Science & Engineering; Mechanical Engineering;
Head, Div. of Materials Science & Engineering;
Director, CELL-MET Engineering Research Ctr.

DAVID CENTER, MD
Professor of Pulmonary Medicine,
Medicine, and Biochemistry;
Chief of Allergy, Pulmonary and Critical Care Medicine
BUSM

CHANDRAMOULI CHANDRASEKARAN, PHD
Assistant Professor,
Anatomy & Neurobiology; Psychological and Brain Sciences; Center for Systems Neuroscience

JERRY CHEN, PHD
Assistant Professor,
Biology

CHRISTOPHER CONNOR, MD, PHD
Assistant Professor,
Anesthesiology
BUSM

QIANG CUI, PHD
Professor,
Chemistry

DOUGLAS DENSMORE, PHD
Professor,
Electrical and Computer Engineering

ANDREW EMILI, PHD
Professor,
Biology; Biochemistry;
Director, Center for Network Systems Biology

SHYAMSUNDER ERRAMILLI, PHD
Professor,
Physics

JEFFREY GAVORNIK, PHD
Associate Professor,
Biology

LEE GOLDSTEIN, MD, PHD
Associate Professor,
Psychiatry; Neurology; Opthalmology; Pathology and Laboratory Medicine
BUSM

FRANK GUENTHER, MS, PHD
Professor,
Sargent College,
Speech Language and Hearing Science

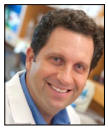
JAMES A. HAMILTON, PHD
Professor,
Physiology and Biophysics
BUSM

MICHAEL HASSELMO, PHD
Professor,
Biology;
Director, Center for Systems Neuroscience

LAERTIS IKONOMOU, PHD
Assistant Professor,
Medicine
BUSM

W. CLEMENT KARL, PHD
Professor,
Electrical and Computer Engineering

NANCY KOPELL, PHD
Professor,
Mathematics



DARRELL N. KOTTEN MD
Professor,
Medicine, BUSM
Director, Center for Regenerative Medicine

ANN MCKEE, MD
Professor,
Neurology & Pathology, BUSM

PANKAJ MEHTA, PHD
Professor,
Physics

ELISE F. MORGAN, PHD
Professor,
Mechanical Engineering

S. HAMID NAWAB, PHD
Professor,
Electrical and Computer Engineering

ELAINE O. NSOESIE, PHD
Assistant Professor,
School of Public Health

PIETER NOORDZIJ, MD
Professor,
Medicine
BUSM

GEORGE O'CONNOR, MD, MS
Professor,
Medicine
BUSM

IOANNIS PASCHALIDIS, PHD
Professor,
Electrical and Computer Engineering

TYLER PERRACHIONE, PHD
Associate Professor,
Sargent College: Speech, Language & Hearing Sciences

STEVE RAMIREZ, PHD
Assistant Professor,
Psychological & Brain Sciences

TOMMASO RANZANI, PHD
Assistant Professor,
Psychological & Brain Sciences
Assistant Professor,
Mechanical Engineering;
Materials Science & Engineering

ROBERT M. G. REINHART, PHD
Assistant Professor,
Psychological & Brain Sciences;
Director, Cognitive & Clinical Neuroscience Laboratory

MICHELLE SANDER, PHD
Associate Professor,
Electrical and Computer Engineering,
Materials Science & Engineering

BENJAMIN SCOTT, PHD
Assistant Professor,
Psychological and Brain Sciences

DANIEL SEGRÈ, PHD
Associate Professor,
Biology

Affiliated Faculty Cont.

SATISH K. SINGH, MD
Associate Professor, Gastroenterology BUSM

CARA STEPP, PHD
Professor, Sargent College, Speech, Language & Hearing Science

ROBERT A. STERN, PHD
Professor, Neurology, Neurosurgery, and Anatomy; Neurobiology BUSM

LEI TIAN, PHD
Assistant Professor, Electrical and Computer Engineering

M. SELIM ÜNLÜ, PHD
Professor, Electrical and Computer Engineering

ARTURO VEGAS, PHD
Assistant Professor, Chemistry

DAVID WAXMAN, PHD
Professor, Biology; BioInformatics; Medicine

ZEBA WUNDERLICH, PHD
Assistant Professor, Biology

JI YI, PHD
Assistant Professor, Medicine BUSM

MEG YOUNGER, PHD
Assistant Professor, Biology

KATHERINE YANHANG ZHANG, PHD
Professor, Mechanical Engineering

XIN ZHANG, PHD
Professor, Mechanical Engineering; Electrical and Computer Engineering; Materials Science & Engineering

Postdocs

POSTDOCTORAL ASSOCIATES

Alnahhas, Razan *(Dunlop)*
Andreadni, Virgile *(Dunlop)*
Angstman, James *(Khalil)*
Beldzik, Ewa *(Lewis)*
Chiesa, Guilio *(Khalil)*
Ching, Meining Carley *(Zaman)*
Ching, Tsz Him (Terry) *(Chen)*
Fomin-Thunmann, Natalie *(Devor)*
Frostig, Hadas *(Mertz)*
Gao, Yuanyua *(Boas)*
Hager, Emily *(Sgro)*
Jacob, Len *(Lewis)*
Jaswal, Rajneesh *(Galagan)*
Kinstlinger, Ian *(Wong W)*
Klumpe, Heidi *(Chen)*
Kureli, Gulce *(Boas)*
Lugagne, Jean-Baptiste *(Dunlop)*
McLellan, Micheal *(Chen)*
Moussa, Hagar *(Khalil)*
Moya, Maria *(Economo)*
Ngo, Mai *(Chen)*
Perez, Pablo *(Devor)*
Pham, Thao *(Roblyer)*
Ravikumar, Arjun *(Khalil)*
Raymond, Michael *(Khalil)*
Shaw, William *(Khalil)*
Sun, Yidan *(Dennis)*
Sundaram, Subramanian (Chen)
Teo, Jessica *(Chen)*
Tierrafria, Victor *(Galagan)*
Uroz, Marina *(Chen)*
Wong, Brandon *(Khalil)*

Research Staff

SENIOR RESEARCH SCIENTISTS

Desai, Darash *(Zaman)*
Kilic, Kivilcim *(Devor)*
Kim, Jae *(Vajda)*

RESEARCH SCIENTISTS

Bays, Jennifer *(Chen)*
Buczek-Thomas, Joann *(Wong, J)*
Jiang, John *(Boas)*
Kim, Sudong *(Chen)*
Lin Wei *(Roblyer)*
Tseng, Hua-an *(Han)*
Xiao, Sheng *(Mertz)*
Zimmerman, Bernhard *(Boas)*

RESEARCH TECHNICIANS

Anakwe, Stephanie *(Lewis)*
Charles, Roger *(Galagan)*
Dubb, Jay *(Boas)*
Hussein, Rana *(Zaman)*
Kelleher-Tang, Laurie *(Chen)*
Kura, Sreekanth *(Boas)*
Martin, Emily *(Devor)*
Mlawer, Samuel *(Connizzo)*
Morales, Christian *(J Wong)*
Morgan, Odysseas *(Khalil)*
Ugarte-Nunez, Juan Luis *(Economo)*
Yee, Jessica *(Lewis)*
Zamballo, Courtney *(Lewis)*
Zimmerman, Dabriel *(Lewis)*

BIOENGINEERING TECHNOLOGY & ENTREPRENEURSHIP CENTER

AT BOSTON UNIVERSITY'S COLLEGE OF ENGINEERING

The Bioengineering Technology & Entrepreneurship Center (BTEC) is designed to transform education and innovation for bioengineering students through hands-on learning. BTEC is a 5000-square-foot, bioengineering "maker space" with a Molecular, Cellular, and Tissue Engineering Suite, a BioSensors and Instrumentation Suite, and the eClinicalWorks Digital and Predictive Medicine Design Suite.

BTEC advances corporate-academic partnerships which include industry-mentored student projects. These partnerships are realized through an extraordinary advisory board made up of leaders in the biotechnology, pharmaceutical, and medical technology industries. Board companies gain early insights into faculty research and activities while providing explicit input on educational program content at the consortium-level to best prepare students for the workforce.

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BU's Biomedical Engineering Department is among the largest of its kind in the US, and is home to numerous research labs:

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Biomedical Optics Lab
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Brain and Vision Laboratory
Cell and Tissue Mechanics Laboratory
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BU RESEARCH CENTERS

BU has eight interdisciplinary research centers that are directed by BME faculty:

BTEC

Bioengineering Technology and Entrepreneurship Center

Transforming education and innovation for bioengineering students through hands-on learning in partnership with industry, from gene editing to biosensors to digital medicine

BDC

Biological Design Center

To rigorously understand life's design principles and re-engineer them to revolutionize our approach to addressing critical challenges in human health and the environment

BMERC

Biomolecular Engineering Research Center

Developing and applying computational methods for the analysis and design of structures, functions, interactions, regulation and evolution of biological macromolecules

CFD

Center on Forced Displacement

Fostering research and engagement with the global challenge of forced displacement, through multidisciplinary teams from across BU, around the country, and around the world

CELL-MET

NSF Engineering Research Center in Cellular Metamaterials

Developing tissue-engineering principles to create scalable, low-cost technologies for growing clinically significant cardiac tissues from cell-level building blocks

BUnano

Nanotechnology Innovation Center

Where nanomaterials intersect medicine and energy through collaborative interdisciplinary research

NPC

Neurophotonics Center

Advancing our understanding and treatment of brain disorders through advanced optical science and photonic systems

PDC

Precision Diagnostics Center

Discovery, design and development and clinical translation of technology for disease screening and monitoring, treatment management and health maintenance

SENIOR DESIGN GUEST LECTURERS 2022-2023

David Shawn, Associate Director for Writing in the Disciplines, Boston University

Ray Han*, Managing Director, Accenture

Thomas P. McNulty*, Counsel, Lando & Anastasi (**BTEC Sponsor**)

Careers Paths Panel:

Erica Pratt, Assistant Professor of Biomedical Engineering, Boston University

Uros Kuzmanovic*, CEO and Co-Founder, BioSens8

Gabriella Stueber*, Head of Marketing, Elephas

Poling Yeung*, Director of Business Systems and Field Excellence, Alexion Pharmaceuticals

**BU Alum*

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SENIOR
DESIGN
PROJECTS
CONFERENCE

2023

Conference Agenda

BU Department of Biomedical Engineering

SENIOR DESIGN PROJECTS CONFERENCE 2023

Conference Agenda

May 5, 2023 9:30am - 4:30pm
Track 1 PHO 203 | Track 2 PHO 206
Reception to follow at the BU Center for Computing & Data Sciences

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9:30 - 10:00 Continental Breakfast and Check-in **Atrium**

Track 1 - PHO 203

10:00 - 10:05 WELCOME Prof. Darren Roblyer

Affiliations not specified are BU BME

Session A

Devices 1 PHO 203

Session Chair: Prof. Xue Han

11:05 - 11:20 Coffee Break **Atrium**

12:05 - 1:00 Lunch **Atrium**

Session B

Devices 2 PHO 203

Session Chair: Prof. Irving Bigio

2:30 - 2:45 Coffee Break **Atrium**

Session C

Neuroengineering **PHO 203**

Session Chair: Prof. Michael Economo

Track 2 - PHO 206

10:00 - 10:05 WELCOME Prof. Diane Joseph-McCarthy

Session A

Cancer Technologies PHO 206

Session Chair: Prof. Liang Hao

11:05 - 11:20 Coffee Break **Atrium**

12:05 - 1:00 Lunch **Atrium**

Session B

Digital & Predictive Medicine PHO 206

Session Chair: Prof. Brian Depasquale

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1:00 - 1:15 **Software for Closed-loop Neurofeedback** 63
Team 11: Emma Hartman, Yuhan Li, Yuke Li, Wei-Fang Liu, Yongjun Lu
Advisors: Len Jacob, Josh Levitt, Laura Lewis

1:15 - 1:30 **White Matter Lesion Quantification from Structural Brain Images** 64
Team 37: Farida Korna, Aurelia Leona, Soumaya Fayie, Kfir Flank, Alexandra Dolynuk
Advisors: Barnaly Rashid, David Salat (Niji Neuro Corp)

1:30 - 1:45 **Interactive Speech Therapy Application for Children with Autism Spectrum Disorder** 65
Team 15: Aida Berberian Morales, Jason Lipari, Emily Boyce, Ashraye Vallabhaneni
Advisor: Dr. Andrey Vyshedskiy (BU, ImagiRation)

1:45 - 2:00 **Integrated Platform for Cell Quantification, Morphometrics, and Statistical Analysis** 66
Team 21: Chenkai Yao, Kevin Yuyang Kang (ECE)
Advisor: Tuan Leng Tay, (BU Biology, Anatomy & Neurobiology)

2:00 - 2:15 **Computational Investigation of Peptide Binding to Fibrin for Molecular Imaging of Post-Surgical Abdominal Adhesions** 67
Team 28: Nicole Ostrovsky, Alisha Ragatz
Advisors: Diane Joseph-McCarthy, Joyce Wong

2:15 - 2:45 Coffee Break **Atrium**

Session C

Synthetic Biology/Cell & Tissue Engineering PHO 206

Session Chair: Prof. Mary Dunlop

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2:45 - 3:00 **Developing an In vitro Model of Luminal Breast Cancer** 71
Team 3: Anushka Rathi, Owen Kelly
Advisor: Joe Tien

3:00 - 3:15 **Design of a Streamlined Tissue Engineered Blood Vessel Biofabrication Platform** 72
Team 6: Duy Nguyen, Connor Brashears, Drew Aggarwal, Shawn Xu, Daniel Ludwiszewski
Advisor: Richard Cheng (Chaikof Lab - Harvard Medical School/Beth Israel Deaconess Medical Center)

3:15 - 3:30 **Expanding the Optogenetic Toolkit through the Development of Light-inducible Phenotype Switches for Multiplexed Control of Gene Expression** 73
Team 25: Jenny Deng, Vinaya Akavoor, Chenxuan Tong
Advisors: Cristina Tous, Wilson Wong

3:30-3:45 **Leveraging Optogenetics for the Development of Tissue Patterning** 74
Team 33: Miguel Mazumder, Gaby Berniac, Richaa Kalva
Advisors: Wilson Wong, Ian Kinstlinger

3:45 - 4:00 **High-throughput *In Vitro* Assessment of Paracrine Factors in Cardiac Fibrosis** 75
Team 35: Artemis Margaronis, Medha Shekhar
Advisors: Jourdan Ewoldt, Anish Vasan, Jeroen Eyckmans, Christopher Chen

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4:00 - 4:30 Awards and Closing Remarks **PHO 206**
Prof. Diane Joseph-McCarthy, Prof. Darren Roblyer, Prof. John White

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Projects Previously Presented

Projects containing confidential information (private presentations)

Microneedle Array-Based Kit for Painless Point-of-Care Anemia Diagnostics
Team 4: Jordan Ahn, Chloe Grubb, Grant Winkey, Kelton Nguyen
Advisors: Javier Fernandez Juarez, Heather Fraser, Preeti Putcha (Synthera Health)

Detection and Analysis of Iron Deficiency Biomarkers for Point-of-Care Anemia Diagnostic Test
Team 5: Brandon Kao, Oskar Cheranov, Varun Bhalla
Advisors: Javier Fernandez Juarez, Heather Fraser, Preeti Putcha (Synthera Health)

Bactericidal Topology for Medically Implantable Device Surfaces 79
Team 8: Mia Metni, Ann Rizos, Robert Henderson, Vaibhavi Hansrajani, Gus Betts-O'Rourke
Advisors: David Bealka, Alexander Samaha (DePuy Synthes)

Project Javelin - Titania Nanorods 80
Team 9: Andrew Finebaum, Tomer Kushner, Christo Pulickal, Cristopher Coco
Advisors: David Bealka, Alexander Samaha (DePuy Synthes)

Fixing Irreparable Rotator Cuff Tears By Restoring The Subacromial Space
Team 18: Katie Hill, Alec Perliss
Advisors: Mason Garcia, Ara Nazarian (Beth Israel Deaconess Medical Center)

Track 1

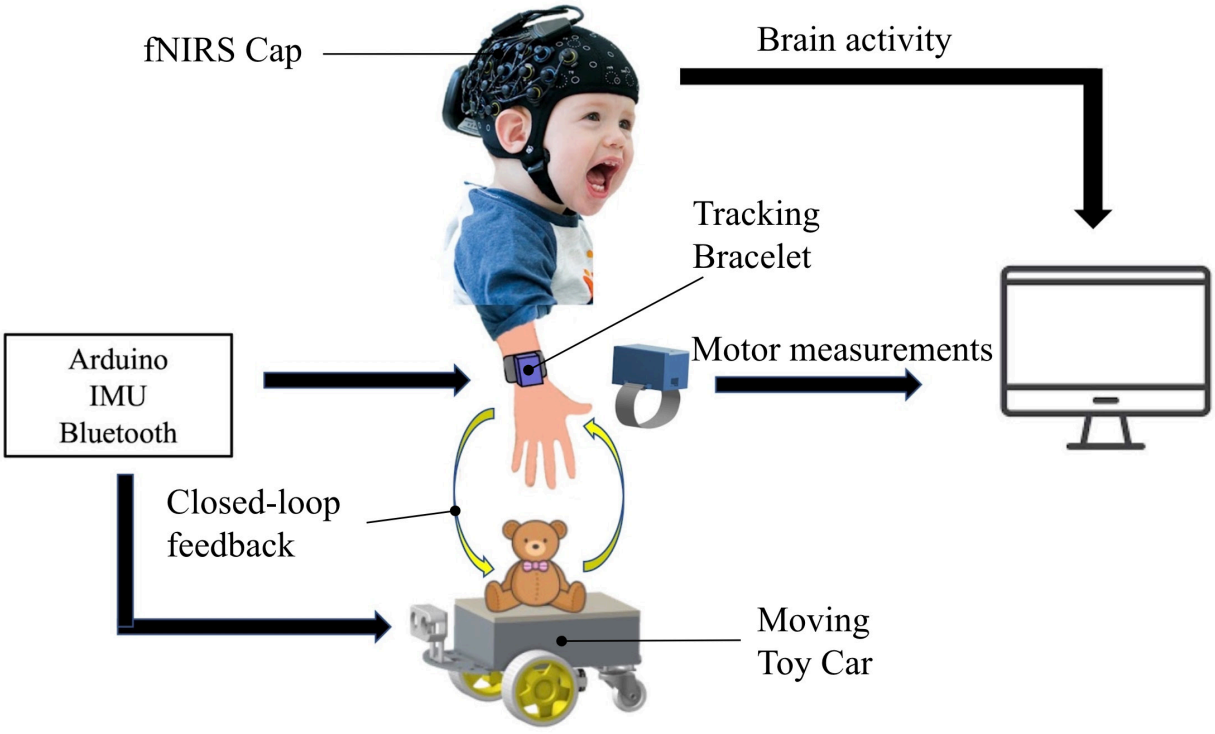
Session A

Devices 1

Development of a Device to Assess Closed-loop Reaching in Children with Motor Disability

Team 30: **Elizabeth Avery, Marian Karam, Tucker Lau, Taylor Ly, and Yue Zeng**
Advisor: **Claudio Ferre (BU, Sargent College)**

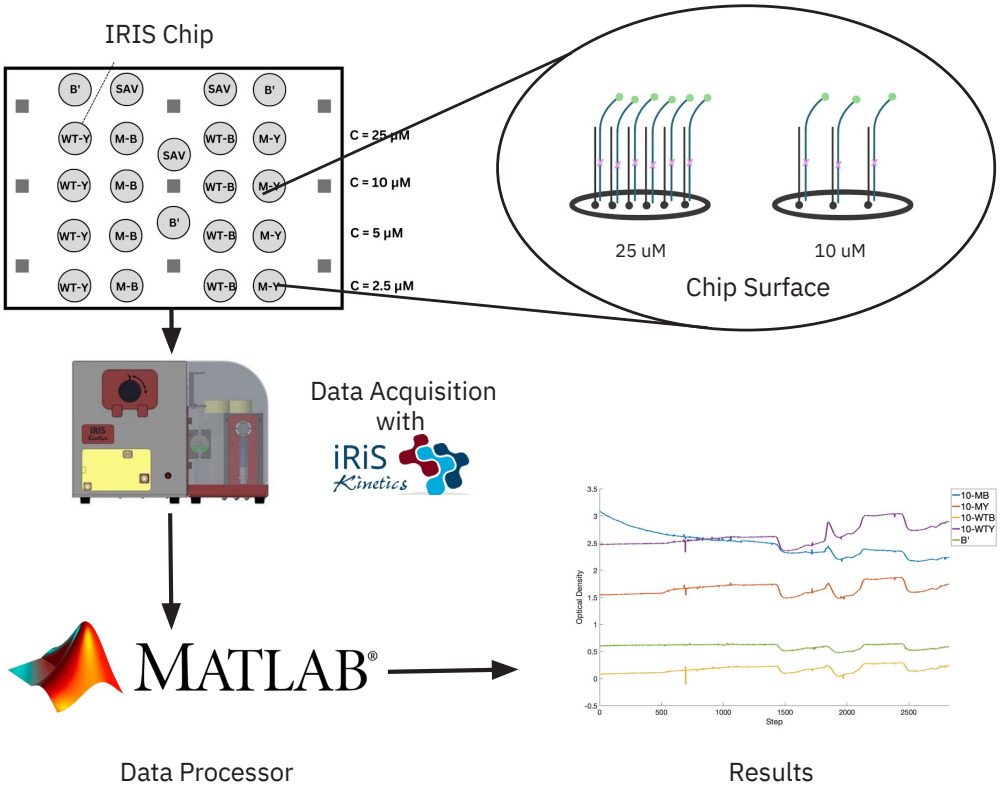
Functional near-infrared spectroscopy (fNIRS) and movement sensors have been used to track motor and sensory function, but by using these in tandem, then we can understand the interrelatedness of sensorimotor functions as it relates to motor disabilities. We propose a non-invasive and child-friendly device that tracks data of reaching trajectories in an adaptive reaching task where signals will be synchronized across movement sensors and fNIRS measurements. The design has three synchronized components: a movement tracking bracelet and a motor-driven moving toy car (keyestudio Smart Small Turtle Robot)—each enclosing an inertial measuring unit (IMU) sensor, an Arduino Uno, and a bluetooth module—and an fNIRS cap that obtains concurrent measurements of brain activity. The adaptive reaching task will be carried out using a closed-loop feedback system between the tracking bracelet that is attached to the child's wrist and the moving toy car that will move away when the child reaches. The objective of creating this device is to promote collection of data that highlights fundamental mechanisms that shape sensorimotor function in healthy children compared to those with CP. This data has potential to help pave the way for redesigned and refined therapies that specifically target systems and functions that might be particularly malleable during sensitive periods of brain development or later when sensorimotor circuits don't have as high of plasticity.



Multiplexed SNP Detection for Rapid Drug Resistance Analysis

Team 19: **Eren Ergene, Nancy Perez, Kyra Scott.**
Advisors: **Selim Unlu (ECE/BME and iRiS Kinetics, Inc), Nese Lortlar Unlu**

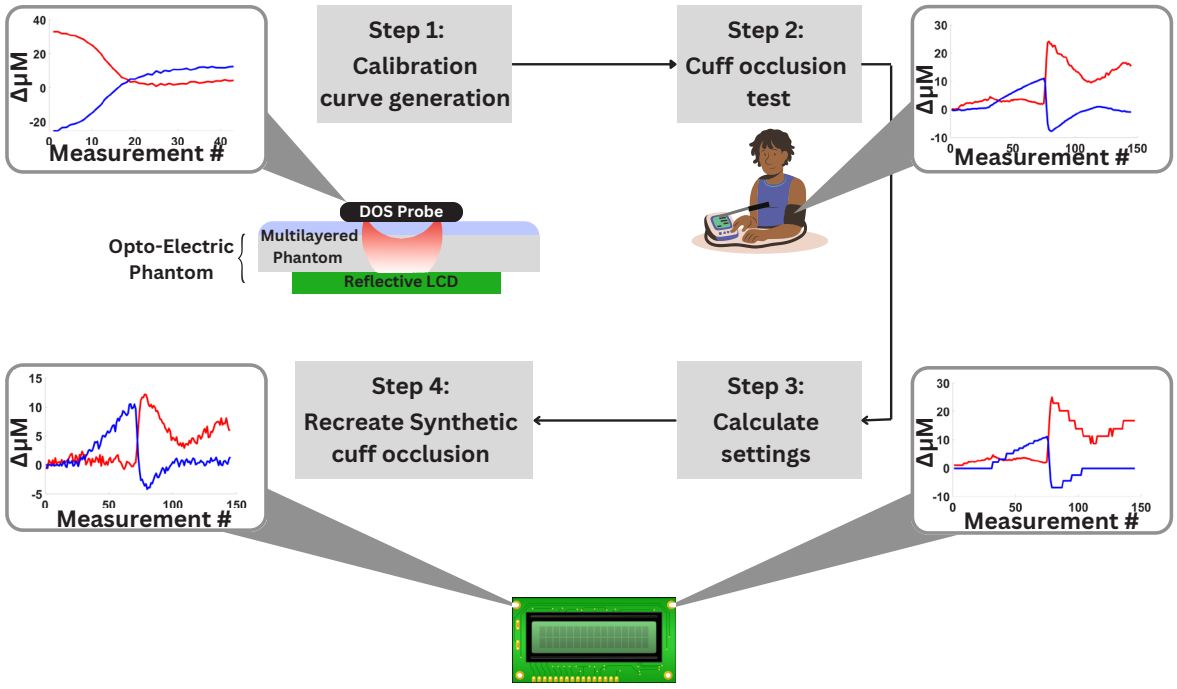
Tuberculosis (TB) can mutate to become untreatable by standard drugs, such as rifampin. Rifampin resistance can occur from a single point mutation. IRIS Kinetics has developed a method for determining if a TB strain is resistant to rifampin using their Interferometric Reflectance Imaging Sensor (IRIS). IRIS quantifies the surface bindings of single nucleotide polymorphisms (SNPs) to the immobilized DNA probes on the surface by using spectral reflectivity to measure mass density over time. The DNA denaturation kinetics for perfect match and single mismatch strands are distinguishable, and their quantified denaturation rates can be used for drug resistance analysis. We have updated the chips and targets to improve upon the current test. First, the amine spot concentration on the chip was decreased in order to allow more room for the SNPs to completely melt. Alternatively, the streptavidin-biotin complex was utilized to provide more order on the chip's surface, as opposed to the previous random copolymer amine surface. The targets were modified with biotin at the distal end to bind with streptavidin, which will increase the amount of DNA melted off. With these modifications, we hypothesized that there will be complete melting of DNA from the surface of the chip, leading to more accurate and reliable results. Our results show a complete decrease from the highest point of biomass accumulation to the original level during the elution buffer phase. From our results, we hope that this technology can later translate to a reliable test that will improve TB diagnosis around the globe.



Electrically Modulated Optical Phantoms for Mimicking In Vivo Hemodynamics of Layered Tissue

Team 20: **Nicholas Wayhs, Saif Ragab**
Advisors: **Darren Roblyer, Carlos Gomez**

Optical phantoms are synthetic materials that simulate tissue optical properties. They are commonly used in imaging system calibration and testing. However, optical phantoms are typically static and cannot recapitulate in vivo tissue hemodynamics. Here we develop new methods to create rigid multi-layered silicone optical phantoms with varying layer thicknesses. We then incorporated the use of a reflective LCD in tandem with the multilayered optical phantoms to mimic tissue hemodynamics. This electro-optical device changes the contrast setting of the LCD by changing the control voltage. Different contrast settings reflect and absorb different amounts of light which effectively changes the optical properties of the phantom. We measured a participant's chromophore values during a cuff occlusion in order to evaluate the validity and repetitively of the electro-optical phantom. The thickness of the multilayered phantom was determined via ultrasound on the arm. Then, using calibration curves acquired by a diffuse optical spectroscopy system and our electro-optical phantom, we calculated the LCD settings required to recreate the change in chromophore values from the participant's measurements. We then recreated the chromophore curve using our multilayered electro-optical phantoms and the LCD settings we calculated. Finally, to further expand the capability of our phantoms, we tested different methods to incorporate new hydrophobic absorbing dyes. These dyes can expand the versatility of optical phantoms to the shortwave infrared (SWIR) wavelength region. These developments represent a major step forward in the development of dynamic optical phantoms for the biophotonics community.

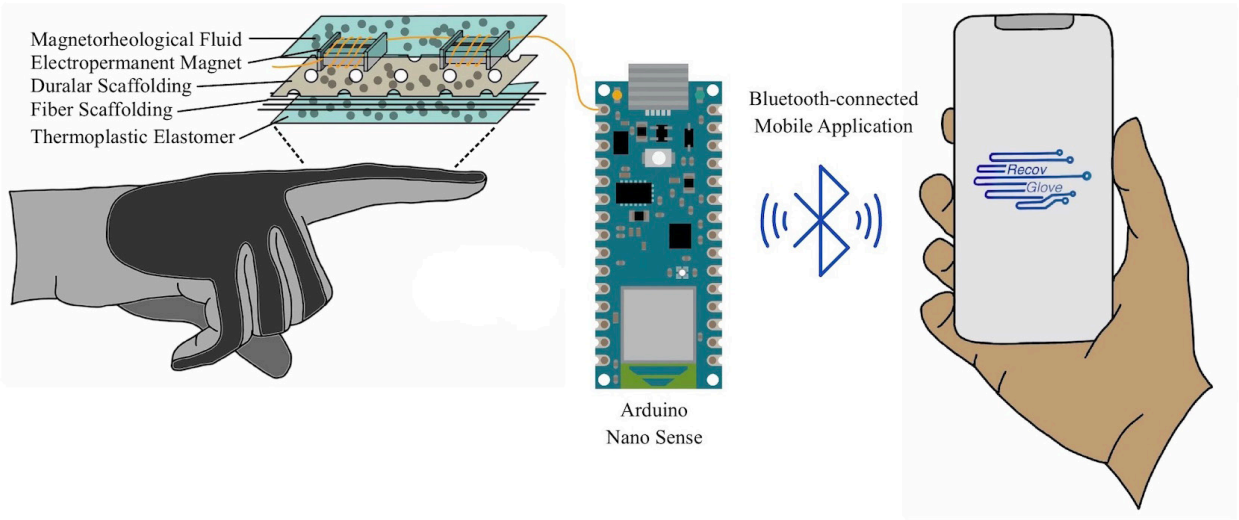


Soft Robotics for Active Resistance Hand Rehabilitation

Team 22: **Megan Le, Tessa Johnson, Caroline Stevenson (ECE), Tommy Murillo, Justin Sadler (ECE) INTERDISCIPLINARY**

Advisor: **Tommaso Ranzani (BU Morphable Biorobotics Lab)**

Approximately 80% of stroke survivors suffer from hand impairment, which typically requires physical therapy to recover hand function. Various rigid devices have been developed but are restricted by their bulkiness, complexity, expense, and limited range of motion. Therefore, there is a critical need in the healthcare industry for soft robotics due to their high deformability, compliance, and ability to adapt to different environments. However, the deformability and compliance of soft materials limits their ability to exert large forces on demand. One of the approaches developed by researchers to allow for on demand stiffening is jamming structures. Jamming provides tunable mechanical behavior by increasing the density of closely packed elements, such as granules, fibers, or layers. Jamming can be induced by magnetorheological fluid (MRF), a smart fluid that changes to a solid-like state under an applied magnetic field and reverts to its original liquid state once the magnetic field is removed. A rehabilitative device was developed that utilizes stiffening mechanisms in conjunction with MRF to exert resistance against movement of the impaired hand as a method to restore hand strength. Electropermanent magnets were connected in a circuit to apply a magnetic field that can be turned on/off via a Bluetooth connection to a mobile application. The device was then evaluated using a mass-deflection test on an acrylic, single-joint linkage. This research is a novel application for an at-home rehabilitative device and will provide a framework for magnetically-induced stiffening within the field of soft robotics.

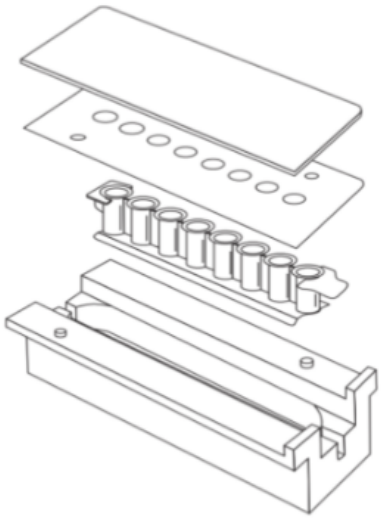


Accessible, Efficient, and Reusable Cytospinning Apparatus for Cancer Diagnostics

Team 23: **Kate Lee, Olivia Lewallen**
Advisor: **Hannah Peterson (Aperture Bio)**

Cytospinning is a technique used to process cell suspensions from biopsy samples for testing. Cytospinning is the process by which cells suspended in fluid are exposed to an applied force and disperse concentrated onto a microscope slide. Aperture Bio practices extreme precision in profiling minute samples from the tumor microenvironment. Fine needle aspiration (FNA) biopsies are collected at clinical sites and sent to Aperture Bio for processing and analysis via cytospinning, staining, and imaging for biomarkers using immunofluorescence technology. Biomarkers are a measurable substance (proteins, molecules, etc.) in an organism whose presence is indicative of some phenomenon such as disease or infection. Within the images of cytospinned cells, the specific biomarkers detected are analyzed to determine cancer type and severity, and the results are reported back to clinics. The current system used by Aperture Bio for cytospinning (Octospot, Epredia, Kalamazoo, MI, USA) has inherent flaws that decrease sample capacity by 50%, significantly delay processing with backordered items, and impose plastic waste onto the environment. This project will serve to improve upon the cancer diagnostics process at Aperture Bio by creating a new reusable cytospinning apparatus with increased sample capacity and in-house manufacturability. This will ensure efficient sample processing and quicker results for patients, doctors, and other company partners.

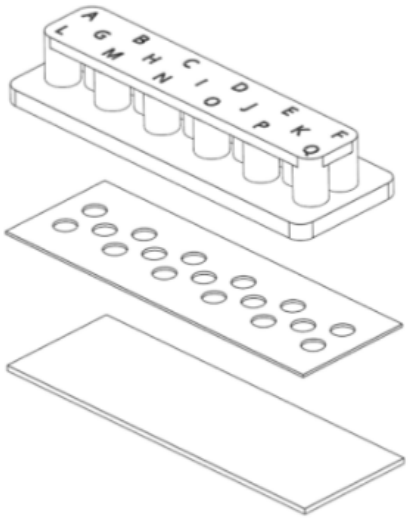
Previous Technology: Octospot™



Complications…

1. Significant backorder issues
   - inaccessible and unreliable
2. Outer 4 wells do not function properly
   - 50% sample capacity loss
3. 8-well strip is thin one-use plastic
   - wasteful, not eco-friendly

New Cytospinning Apparatus



Well Block

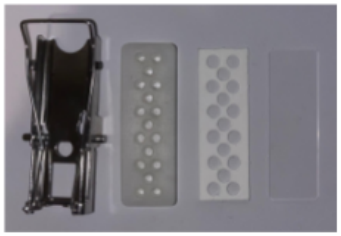
- 3D printed using SLA biocompatible resin for reusability
- Sample capacity increase by 212.5%
- Alphabetical well labels for ease of use

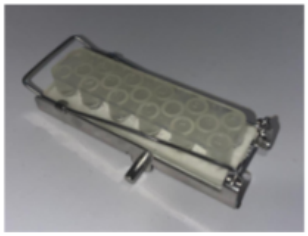
Filter Paper

- Adapted for new well count
- Thicker paper for better filtration

Microscope Slide

- Standard 1” x 3” size for protocol integration

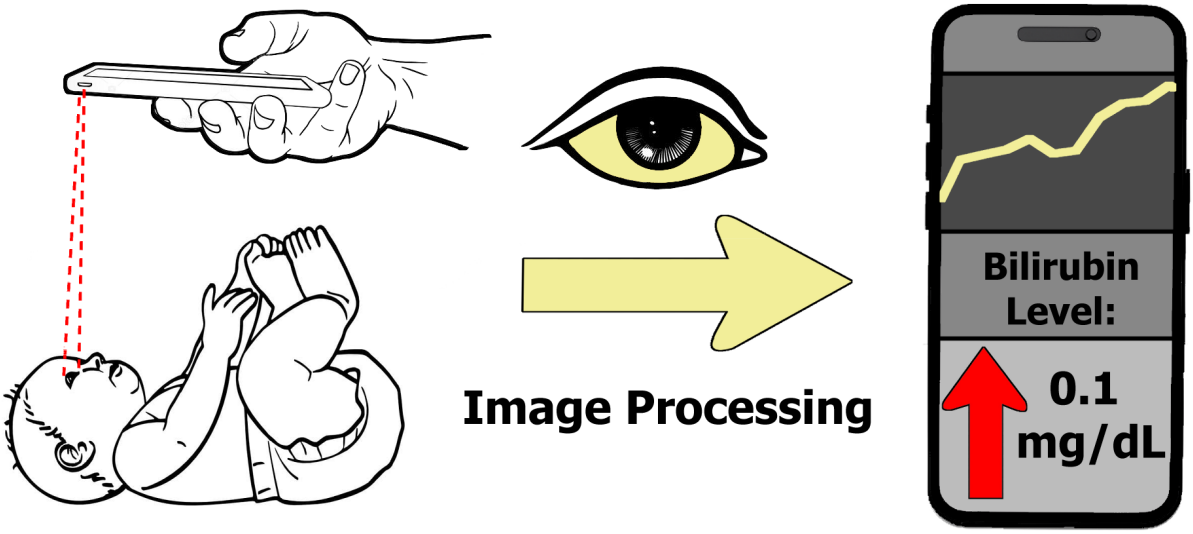




Smartphone Based Detection and Monitoring of Skin Jaundice in Newborn Babies

Team 38: **Hailey Fox, Minh Nguyen, Paridhi Surana, Esha Vaishnav**
Advisors: **Siddarth Rathi and Sanjivan Patel (Rathi Creative), Kavon Karrobi, Christine Mulvey**

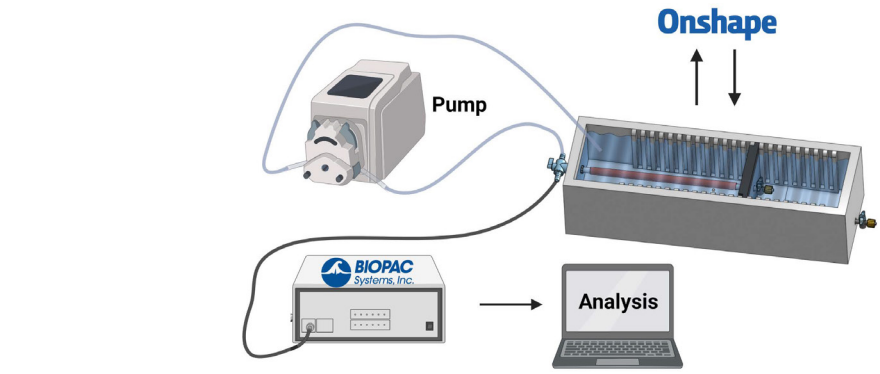
Neonatal jaundice, or hyperbilirubinemia, caused by elevated levels of bilirubin in blood, is a common occurrence in newborns. Severe hyperbilirubinemia when left untreated will lead to detrimental brain damage and that sometimes is fatal. However, it is preventable if the jaundice is identified early and monitored appropriately. Unfortunately, peak bilirubin levels often occur 3-5 days after birth, after newborns are typically discharged from the hospital. By creating a smartphone app capable of detecting and monitoring bilirubin levels with an appropriate accuracy compared to professionally used transcutaneous bilirubinometers, we may reduce the numbers of unnecessary hospital visits as well as increase detection and care for jaundice newborns. In our experiments, phantoms of human sclera were made in substitution of real neonatal sclera, with the use of tartrazine as an alternative for bilirubin due to similar optical properties but much cheaper price in bulk. Many phantoms were created with varying concentrations of tartrazine, which corresponded to bilirubin concentrations in a normal to critical range. These phantoms were then pictured and analyzed with our code. The corresponding bilirubin levels were found to be strongly correlated to the yellow color intensity from the associated images. This suggests that using the data and code we created, we will be able to accurately detect and monitor jaundice levels in newborns using a smartphone.

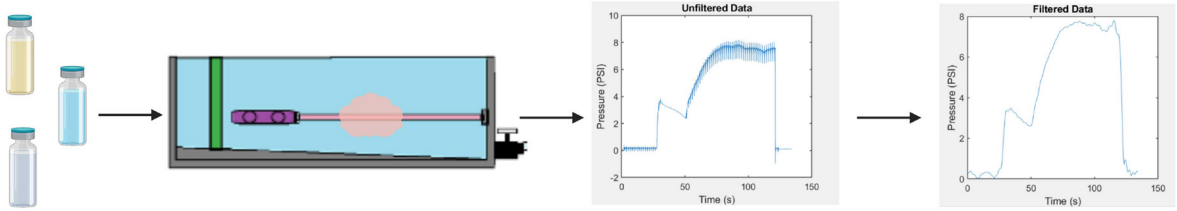


Burst Pressure/Leak Testing System for Surgical Adhesives

Team 12: **Aniket Joshi, Prinjali Kalyan, Felicia Pinto, Brian Zhou**
Advisors: **Daniel King, Beau Landis, Joseph Urban, Corin Williams (Draper, a BTEC Sponsor)**

Surgical adhesives are a less traumatic and faster alternative to sutures and staples. Development of new adhesives requires adequate mechanical testing including measurement of the burst pressure of each adhesive. Current standardized burst pressure testing methods do not mimic in vivo conditions, as is done in this system by submerging the vessel for the duration of testing. Previous teams at Draper have conducted proof-of-concept testing to measure the burst pressure of surgical adhesives once applied to blood vessels. Here, we improve upon previous designs in order to develop a system that increases repeatability of results and allows for a more streamlined setup. To improve upon the main housing box of the testing system, we added a movable insert piece along evenly-spaced ridges and increased the length to accommodate blood vessels of different sizes. For ease of use during experimentation, we added a relief valve that allows for expulsion of contaminated fluid after each trial. The testing system connects to a BioPac pressure sensor that collects and outputs time vs. pressure data. In analysis, we applied a low-pass filter to reduce noise and produce a clear reading of the burst pressure. Finally, we conducted testing of several medical adhesives and compared burst pressure trends to published literature values to validate the data output and ensure repeatability of the system. Through development of the system, Draper will be able to more rapidly and accurately test the strength of surgical adhesives in a simulated physiological environment.





Adhesive Testing **Data Validation**

Track 1

Session B

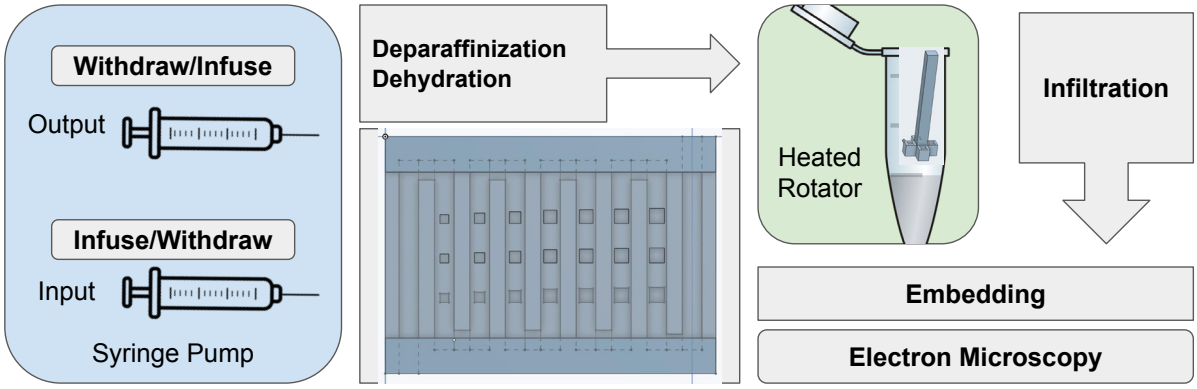
Devices 2

Fluidic Trapping Device for Electron Microscope Sample Preparation

Team 26: **Ziying Zhang, Bo Zhou**

Advisors: **Joel Henderson, Dr. Hui Chen (Pathology & Laboratory Medicine at Boston University Chobanian & Avedisian School of Medicine)**

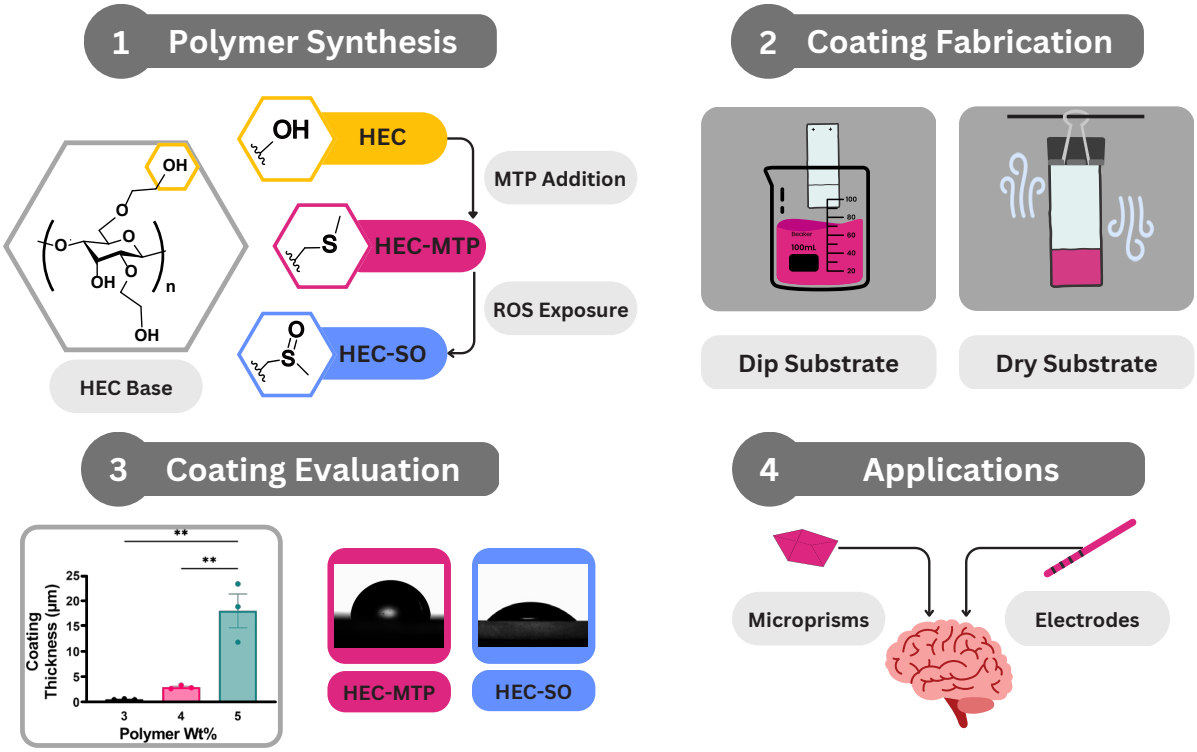
Pathologists use electron microscopy to screen patient intracellular and extracellular structures looking for signs of pathologies in cells. The preparation process of tissue samples for EM requires successive immersion of tissue specimens in a series of solutions for brief periods. Using traditional techniques, this preparation process would involve manual manipulations of the sub-millimeter tissue sample, placing the small tissue at risk for damage or loss. Here, we propose a fundamentally new approach for handling and processing small tissue specimens. Our setup involves a dual-syringe pump, two syringes connected to syringe tubes, two trapping patterns, and a heated rotator. We designed and 3D printed a plate and a rectangular rod with various sizes of trapping cubes to accommodate different sizes of tissues in the range from 400 um to 880 um. For deparaffinization (including rehydration and post-fixation) and dehydration, we first placed the tissue into the corresponding cube of the trapping plate, then utilized the syringe-pump system to alternate between withdrawing and infusing to continuously wash the trapped tissue with different solutions and time required for each process. Then, for infiltration, we transfer the tissue into the rectangular-rod-like trapping pattern and rotate them inside the 1.5 mL tube filled with 1:1 epoxy resin/acetone followed by 100% epoxy resin mixture for a total of five hours. The tissues will be ready for electron microscopy after polymerization in the oven at 60° overnight. By utilizing the new procedures for sub-millimeter tissue preparation, we achieved a small tissue loss rate (1/10) and maintained a similar image quality.



In Situ Hydrating Polymer Coatings to Improve Chronic Performance of Neural Devices

Team 27: **Payton O'Connor, Riya Sen**
Advisor: **Tim O'Shea, Eric DuBois**

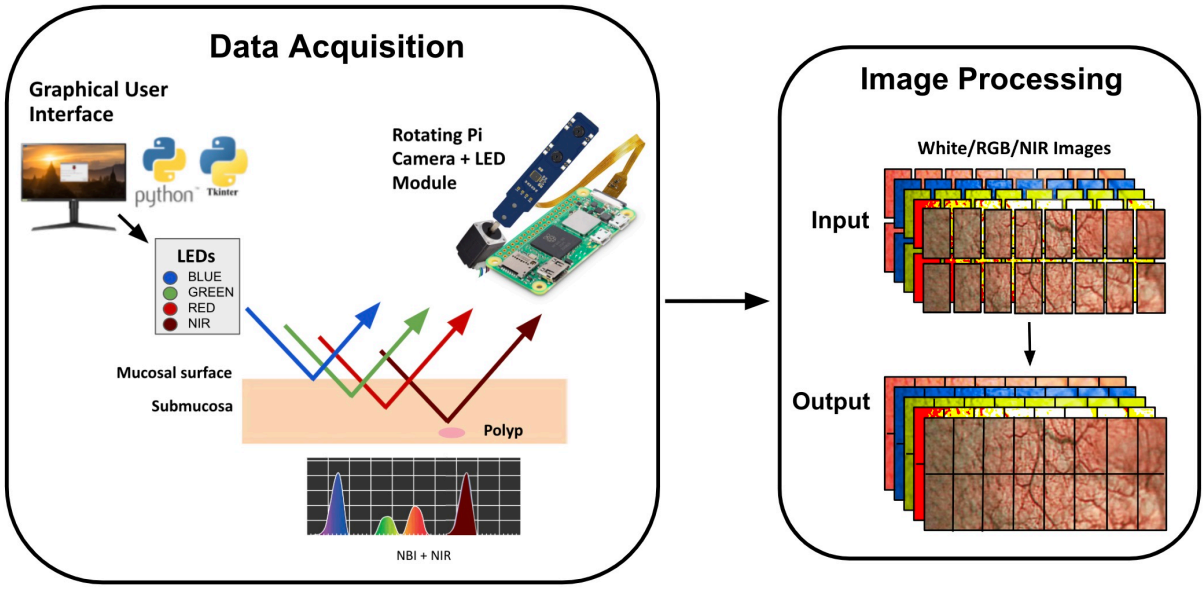
Neural implant devices, such as microprisms and electrodes, are powerful tools used for imaging, disease treatment, and pain management. However, these devices are often stiff compared to surrounding brain tissue and are prone to biofouling with adsorbed proteins, which leads to the initiation of a foreign body response (FBR), causing the premature failure of the implanted devices in vivo. In order to mitigate the unsolved problem of FBR and increase neural device lifetime, we developed a smart, bioactive, cellulose-based polymer coating that can transition its chemical and mechanical surface properties post implantation in response to reactive oxygen species (ROS) that are naturally generated around implant environments. Through the functionalization of hydroxyethyl cellulose (HEC) with 3-(methylthio)-propyl isothiocyanate (MTPI), we synthesized a hydrophobic polymer and optimized dip coating parameters for coating implant surfaces using a solvent system of acetone and dimethyl sulfoxide. We achieved controllable coating thickness and material deposition on a glass substrate through the variation of solvent system, composition, dipping speed, and temperature. When exposed to physiologically relevant concentrations of ROS in vitro, we detected oxidation of thiol ethers on the HEC-MTP polymer to sulfoxides (HEC-SO) that resulted in an increase in hydrophilicity and emergent, non-fouling material properties. Through the optimization of HEC-MTP coatings and coating protocol achieved through this project, we will enable increased quality of data collection and treatment effectiveness for patients suffering from neurodegenerative diseases.



PanCam - Panoramic Camera Design for the Detection of Colorectal Cancer

Team 31: **Naimah Gill, Krish Kapadia, Ksenija Tasich, Sarah Sheng**
Advisors: **Ousama A'amar, Irving Bigio (Boston Veterans Administration Hospital)**

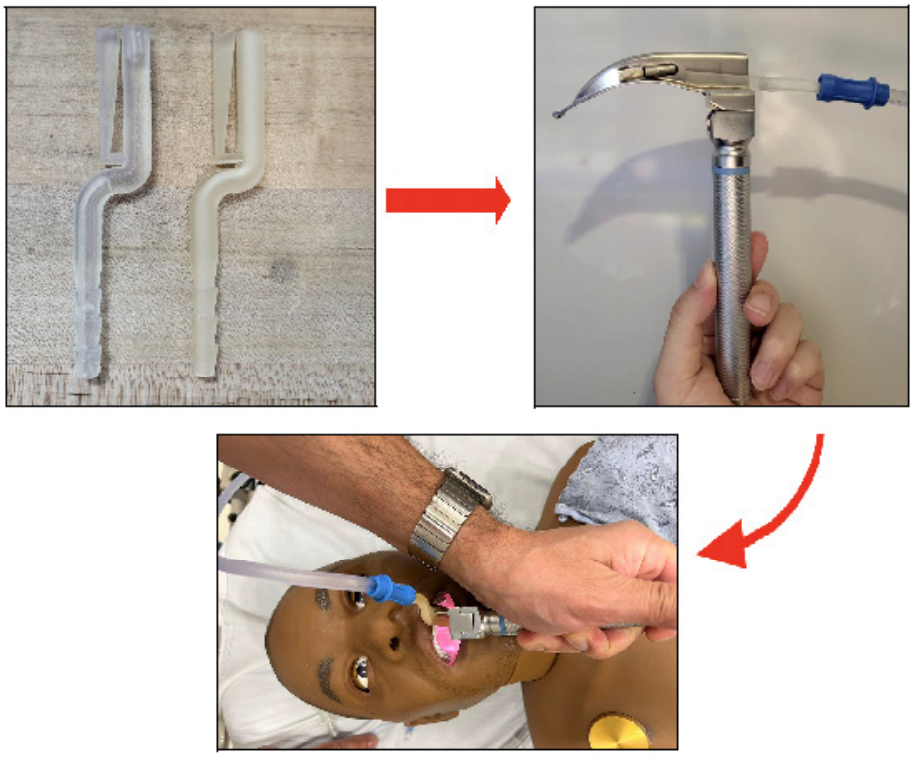
Colorectal cancer (CRC) is the fourth most common type of cancer in the U.S.A. and is the third leading cause of cancer death, with an estimated 52,580 deaths in 2022. The slotted anoscope is the current gold standard for identifying and diagnosing rectal cancer, but is restricted in its ability to view the rectal zone of the colorectal system completely, limiting the endoscopist's ability to distinguish neoplastic from non-neoplastic polyps. The anoscope does not have 360˚ of visibility and is highly invasive. In recognition of the current need for more efficient CRC management, the objective is to develop an ergonomic panoramic imaging device that enables real-time, in vivo assessment of colonic polyp morphology using multispectral imaging and image stitching techniques. To advance the current screening procedures, our proposed project utilizes near-infrared imaging to contrast vascular networks and highlight denser morphology typical of disease progression. With the images captured by the device, gastroenterologists will be able to clearly distinguish between normal and diseased tissue for the identification and pathological prediction of CRC, anal cancer, masses, hemorrhoids, or anal fissures. This would make screening during standard rectal examinations more efficient by allowing doctors to have a more comprehensive view of the area thereby improving the safety, cost and comfort.



Laryngoscopic Attachment

Team 32: **Ruhaan Bhagat, Zixin Guan, Zixian He, Yousuf Shehadi, Camila Zhan Jin**
Advisors: **Tommaso Ranzani, Anand Devaiah (BU Chobanian & Avedisian School of Medicine)**

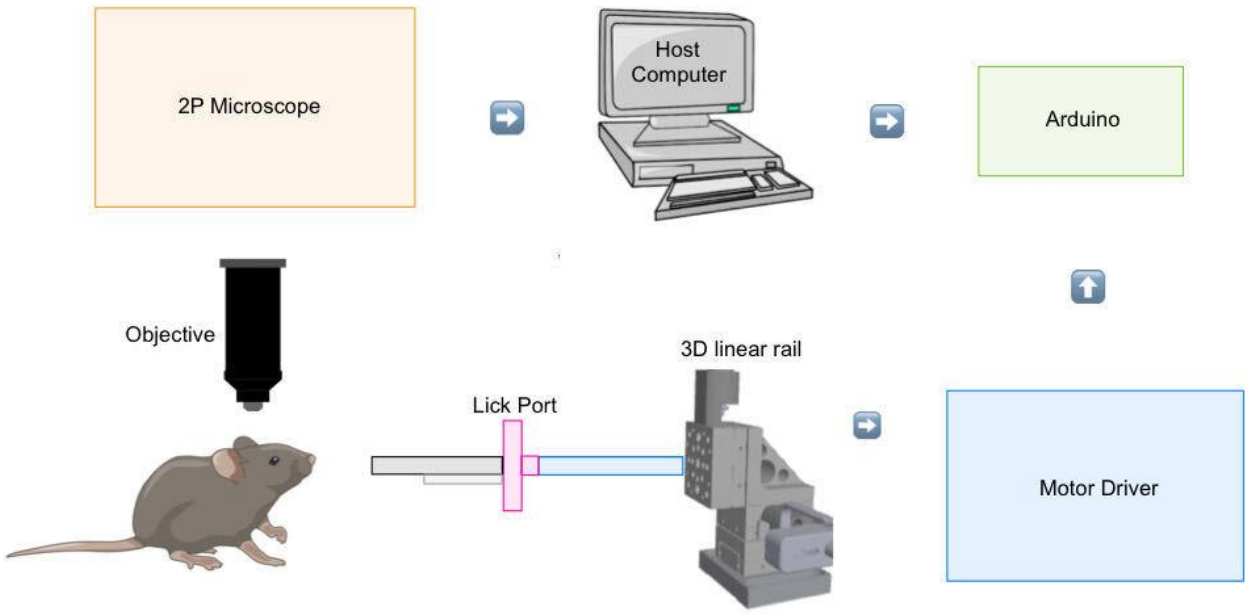
The COVID-19 pandemic has greatly impacted the world, exposing societies to significant risks of contamination and transmission. How COVID-19 can be transmitted through close contact and airborne transmission made the virus highly transmissive. This also impacted the view on how to prevent contaminations during intubation, which is establishing an airway, a bedrock of medical practice, especially when COVID-19 and many other diseases commonly cause respiratory issues. The intubation process is also important for all kinds of emergencies, surgeries, airway support, respiratory support, and other life-supporting needs. While performing intubation for COVID-19 patients, it has shown us that there is a significant risk of respiratory pathogens spreading to near areas through normal breathing and coughing. Being able to actively reduce the pathogen load during intubation would be a significant risk reduction and reduce the need for other more elaborate measures to protect healthcare workers. To address the challenge, we have designed a laryngoscopic attachment that can be attached to various sizes of laryngoscope blades and connects to suction sources available in all operating rooms. Our device has undergone rigorous testing, including fluid collection tests, particle counting tests, and fast Fourier transform analysis, to evaluate the feasibility of the negative pressure environment to collect particles released from breathing and coughing. Our findings demonstrated that the laryngoscopic attachment effectively reduces the exhaled particle load from patients during intubation, enhancing the safety of medical professionals and patients alike.



Automation of a Lick Port for Neuroscience Experiments

Team 39: **Daniel Jiang, Shouhao Jiang**
Advisors: **John White, Brandon Williams**

Automation has emerged as a crucial, time-saving, and accurate technique for researchers across various fields. It ensures consistency in project requirements across different contexts by enabling computer analysis of targets under diverse conditions. In this study, we address the issue of inaccurate lick port positioning, which is vital for measuring fear learning in mice using water as a reward. Traditional manual setups of lick port are inflexible and inefficient for researchers to operate during each neural recording session, which makes an automated lick port positioning system becomes essential. Therefore, we propose the design and construction of a movable, highly accurate lick port to significantly enhance experimental outcomes. Our innovative approach challenges traditional manual lick port control, which can introduce variability and reduce the comprehensiveness of neural circuitry measurements in adaptive learning system studies. Our lick port system for mouse experiments is done by integrating an electric motor with a MATLAB-operated PID control system to control the lick port's position. The circuit board connected the motor and the computer, enabling user input to control the lick port's movements. An accurate positioning based on user input is measured as a key measure of success.



Autonomic Nervous System Data: Automatic Analysis

Team 10: **Mikayla Crowley, Dea Turashvili**
Advisors: **Cara Stepp, Nicole Tomassi (BU Neuroscience)**

Electrodermal activity (EDA) and heart rate (HR) are important measures in analyzing the autonomic nervous system (ANS).Commercially available technology allows for the external measurement of ANS data; however, several limitations exist. Despite the numerous parts of the body that transmit sufficient signals, current research primarily uses the fingertips for collection of data, which poses limitations for many pathologies involving the extremities. Additionally, the analysis of this data typically requires expensive software and/or experience with programming. Thus, our solution is a user-friendly automated analysis program for ANS data, customizable to data collected at varying locations on the body including the forehead, shoulders, and fingertips. To begin, we collected EDA data on the forehead, shoulders, and fingertips as well as HR data on the earlobe and fingertips from 10 different participants at the Stepp lab at BU. Using the data collected, we selected appropriate filters for each electrode location and added it to our software. We also expanded on the measures already being analyzed at the Stepp lab and added a Graphical User Interface (GUI) to make it more user friendly. To use our software, the user will input 4 data sets, electrode location, participant ID, and sampling frequency and click “Run”. The data will then be analyzed and output 9 EDA measures, 3 HR measures, and 2 graphs as a .mat file. This analysis application will aid in future clinical research, as well as any study where measurement of the ANS is not ideal, or possible, from the fingertips.

Track 1

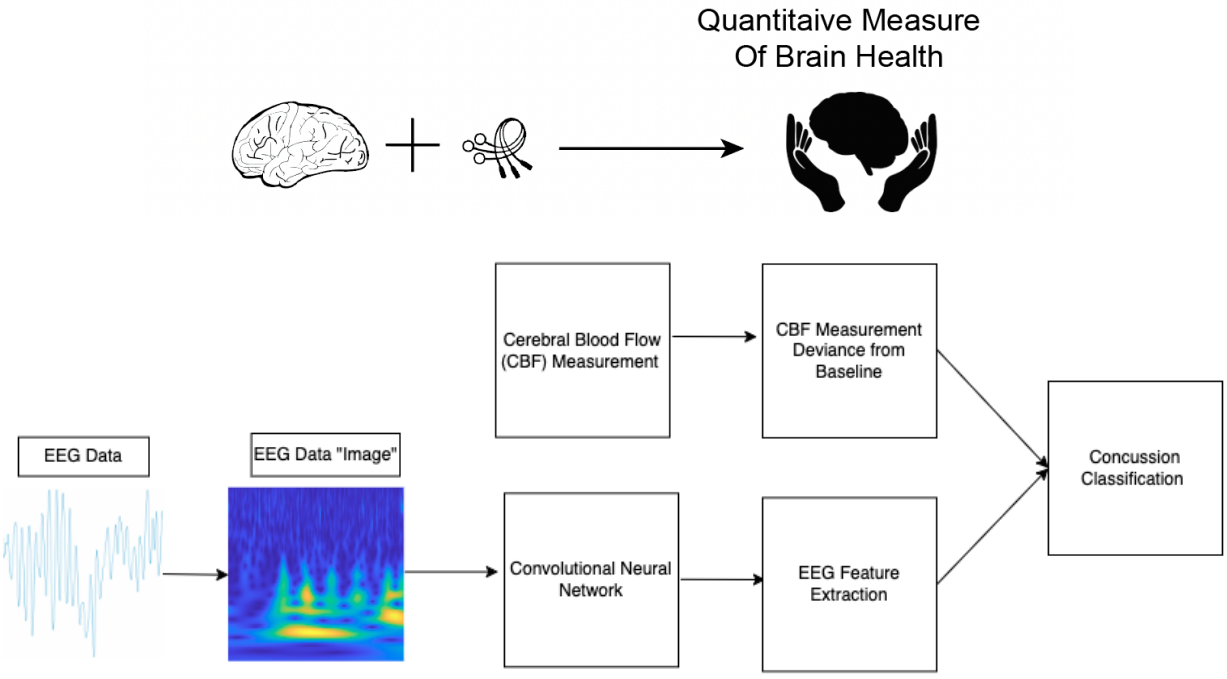
Session C

Neuroengineering

SynapseSafe: A Device To Detect Mild Traumatic Brain Injury (mTBI) In Athletes Using Brain Waves And Cerebral Blood Flow

Team 1: **Layth Amra, Rashid Kolaghassi, Johnathan Muhvich, Maria Shevchuk**
Advisor: **David Boas, Kenny Kim**

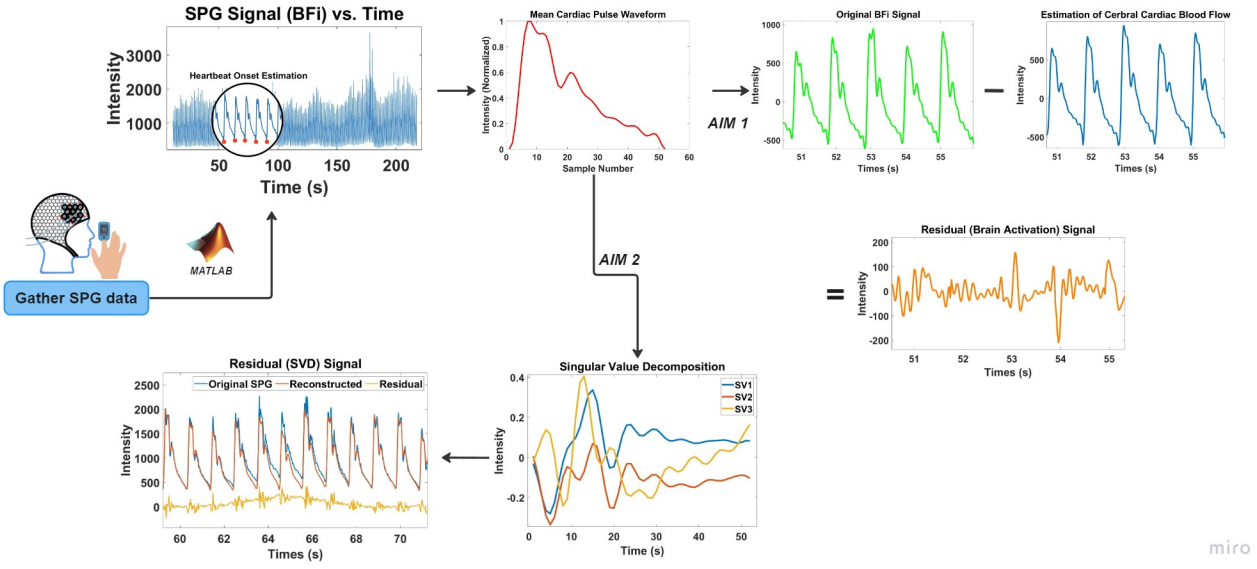
Mild Traumatic Brain Injuries (mTBIs) often go undiagnosed in the general population. The Clinical Journal of Sports Medicine reports that nearly 30.5% (n=486) of athletes in their study reported previously undiagnosed concussions. Individuals with a history of repeated undiagnosed concussions are subject to adverse health effects including neurodegenerative disorders such as Alzheimer's, Chronic Traumatic Encephalopathy (CTE), and reduced life expectancy. Research highlights the promise of quantitative Electroenchaplagrams (qEEG) in detecting mTBIs. These raw EEG signals can be filtered and then transformed into an image using Continuous Wavelet Transformation (CWT) and fed through a Convolutional Neural Network (CNN) to detect concussed subjects. We further seek to improve concussion detection accuracy by incorporating a novel biomarker — cerebral blood flow (CBF). Research reports CBF reduction in gray and white matter in the brain following mTBI in the acute and subacute phases of the injury. Finally, we seek to use this device as more than just a concussion classifier. Research shows that repetitive subconcussive impacts may be the single leading cause of CTE. Subconcussive injuries are inherently hard to detect, and typically are not diagnosed until the damage they cause begins to show symptoms. Our device would give researchers the ability to study both of these biomarkers consistently over a season and see how brain activity changes from baseline from one practice to the next. Furthermore, if proven successful, this device could become a powerful diagnostic tool to assess when repeated subconcussive impacts cause enough damage to warrant intervention with a player.



Utilizing Speckleplethysmographic (SPG) Waveforms To Determine Brain Activation-Induced Blood Flow

Team 2: **Grace Chabbott, Evgeniia Kozlova, Matthew Leal, Chancellor Lee, Ananya Mehta**
Advisor: **David Boas**

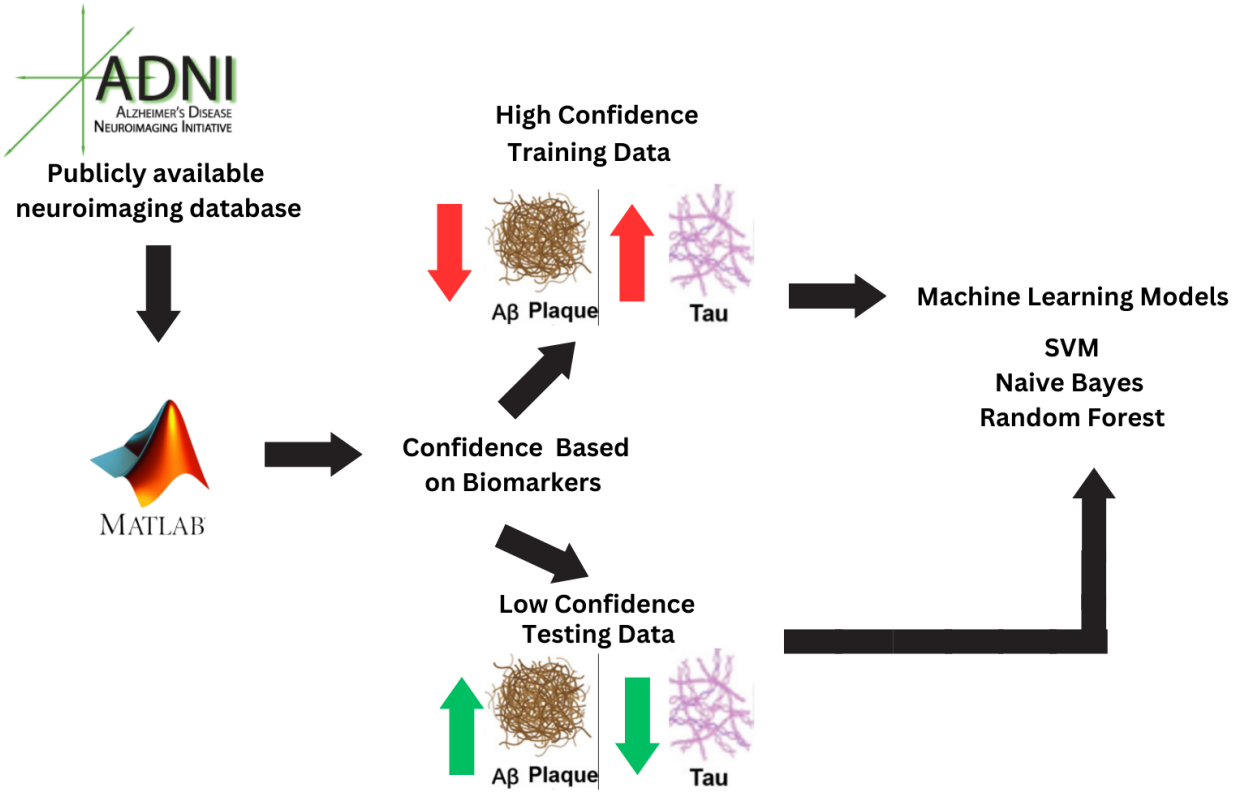
Speckle plethysmography (SPG) is a non-invasive optical imaging method that utilizes laser speckle contrast imaging (LSCI) to analyze blood flow rate changes generated during cardiac systole and vasodilation or constriction. SPG provides similar results as the widely used photoplethysmography (PPG) with the potential to achieve a higher signal to noise ratio (SNR). Measurements of cerebral hemodynamics taken with SPG show waveforms that indicate blood flow in the brain. They are comprised of two components: blood flow generated from cardiac contraction as well as brain activation, also known as hemodynamic response function (HRF). Here we propose a filtering and estimation model to calculate blood flow generated from cardiac contraction alone. A signal filtering model was developed to remove noises as a result of powerline interference, motion artifacts, and low amplitude signals. We determined the best parameter for estimating cardiac pulse onset timing, then scaled the amplitudes in accordance with the original signal. In addition, singular value decomposition (SVD) was employed to select for components that best accounts for pulse shape variability. The described model allows for an accurate estimation of blood flow contributed by heartbeats. After subtracting the cardiac signal, the leftover is indicative of brain activation induced blood flow. The processed SPG signal can be studied under different physical or cognitive tasks to increase our understanding of the cortical functions. Furthermore, it also has clinical implications in the detection and assessment of neurodegenerative diseases such as mild cognitive impairment (MCI) or cortical spreading depolarizations (SD).



Biomarker-Based Optimization For Alzheimer's Disease Classification

Team 36: **Kerena Belony, Nicholas Chong, Aiyana Cubias, Jordana Kasaato, Amber McBorrough**
Advisor: **Barnaly Rashid, Hristina Schlaggar, David Salat (Niji Neuro Corp)**

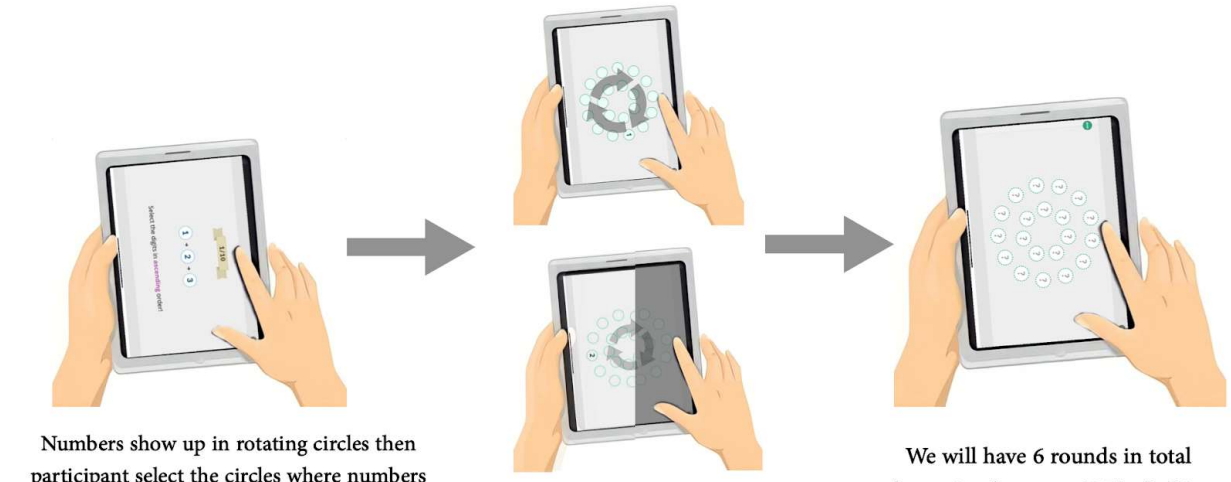
There is currently a gap in the clinical diagnosis of Alzheimer's Disease (AD) as patients may have Alzheimer's pathology, but not have a clinical diagnosis of AD. This can lead to misdiagnosis and late diagnosis. Through the use of morphometric features from brain MRI images, we extracted data from features including the entorhinal cortex, hippocampus, and mid-temporal volume to build machine learning models to determine the likelihood that a patient has AD and to predict the likelihood of a patient developing AD. We generated high confidence groups of patients and controls based on their AD biomarker status to enhance these models. Then, we reviewed if the biomarker status was consistent with how individuals were originally classified as patients or controls in the database. To develop a more accurate method of classifying this disease, we separated our data into training and testing sets according to biomarker based confidence levels. The training data (high confidence) was used to build our algorithm, while the testing data (low confidence) was used to test the algorithm. The data were then applied to three different classification learners: Support Vector Machine (SVM), Naive Bayes, and Random Forest. We found that using biomarker confidence decreased the misclassification rate for each classifier. SVM, Naive Bayes, and Random Forest classification models' misclassification rates decreased by 15.8%, 5.6%, and 5.1%, respectively. These results suggest that biomarker-based confidence rankings are important to include in classifiers for AD to provide more efficient support for the clinical diagnoses.



40 Hz Investigation on Brain Cognitive Ability Enhancement

Team 16: **Junny Myung, Ahmed Al Saif, Ameen Andijiani, Abdulaziz Sulimani, Saud Alfakhri**
Advisor: **Dr. Andrey Vyshedskiy, (BU, ImagiRation)**

People with Attention-Deficit Disorder (ADD) or Attention-Deficit Hyperactivity Disorder (ADHD) often struggle academically compared to their peers throughout their education and the resources available to them are limited. This study aims to explore the potential of 40 Hz gamma light therapy as an alternative and affordable therapy method for enhancing cognitive abilities in individuals with attention deficit disorders. The brain generates electrical activity, referred to as gamma waves, crucial for processing and connecting information. Light administered at 40 flashes per second has demonstrated the ability to reestablish the brain's natural resting 40 Hz gamma rhythm. These gamma waves are linked to memory and cognition, which can be impacted by cognitive impairments. We will use the novel iPad app AlzLife to test the effects of 40 Hz light stimulation on memory and problem-solving abilities in healthy young adults. Our experimental approach consists of six rounds, alternating between flickering 40 Hz light or no light for each round until we reach six rounds in total. We will alternate the implementation of therapy between each subject, whether to start with 40 Hz light or no light, to prevent the effects of cognitive learning on the data. Our study found no significant improvement in memory game performance, with higher scores in the beginning and end rounds potentially due to the distraction of participants. Although light therapy initially yielded slower reaction times, increasing the participant pool is needed for more conclusive results.



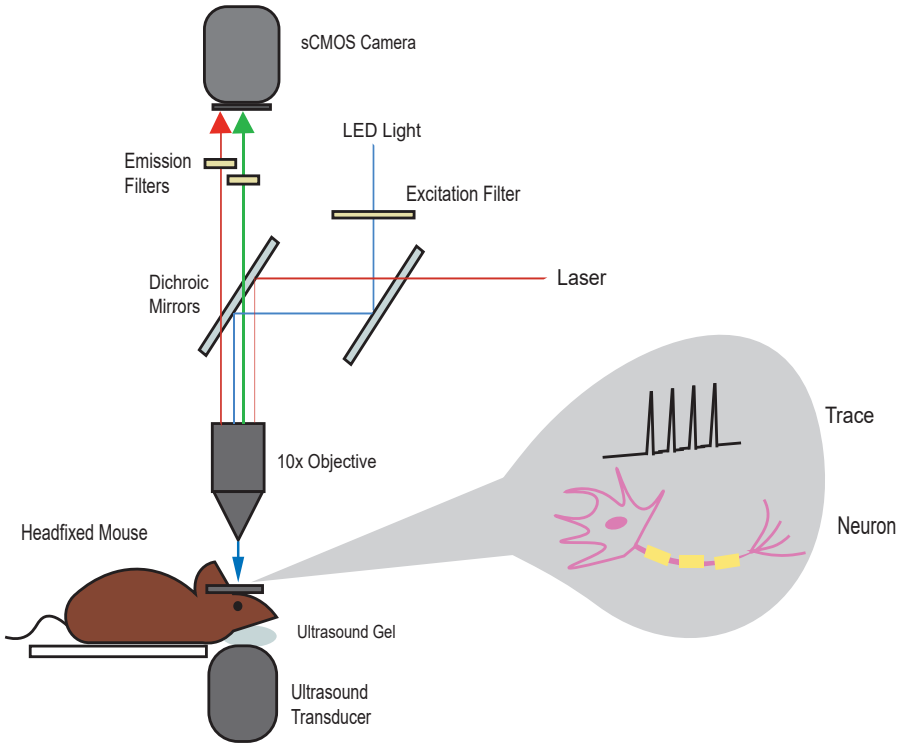
Numbers show up in rotating circles then participant select the circles where numbers appeared either in ascending or descending order

We will have 6 rounds in total alternating between 40 Hz flashing light and no light therapy

Investigating Biophysical Effects of Ultrasound Neuromodulation

Team 40: **Natalia Alonzo, Laura Raiff**
Advisor: **Emma Bortz, Xue Han**

Ultrasound neuromodulation has a broad therapeutic scope including treatment of various neurological and psychiatric diseases. It is a promising technique due to its noninvasive nature, high spatial resolution, and ability to penetrate deep into the brain. Yet, the underlying biophysical mechanisms remain unclear due to inconsistencies across studies, posing a barrier for clinical translation. The Han Lab recently demonstrated that ultrasound transiently increases intracellular calcium in neurons in the mouse brain, but this response does not directly correlate with action potentials. Imaging with genetically-encoded voltage indicators (GEVIs), however, enables direct visualization of membrane potential and neuronal spiking. Furthermore, a preliminary study by Cain et al. obtained significant clinical results with chronic ultrasound stimulation. Building off these studies, we worked towards clinical applicability by using one-photon microscopy to visualize the response to ultrasound of (1) motor cortex interneurons expressing a novel GEVI, SomArchon, and (2) neurons expressing a genetically-encoded calcium sensor, GCaMP. We tested chronic ultrasound parameters on the GCaMP neurons. From identified regions of interest (ROIs) in the video data, we extracted fluorescent traces. In GCaMP neurons, we saw a small percentage of ROIs either positively or negatively modulated with respect to the normalized fluorescence and event density. SomArchon results had higher percentages; most significantly, 40% of PV interneurons' spike rate was negatively modulated. Overall more testing of chronic stimulation is necessary for a robust understanding of underlying mechanisms, but voltage imaging can reveal neural responses to ultrasound that may be unaccounted for during calcium imaging.



Track 2

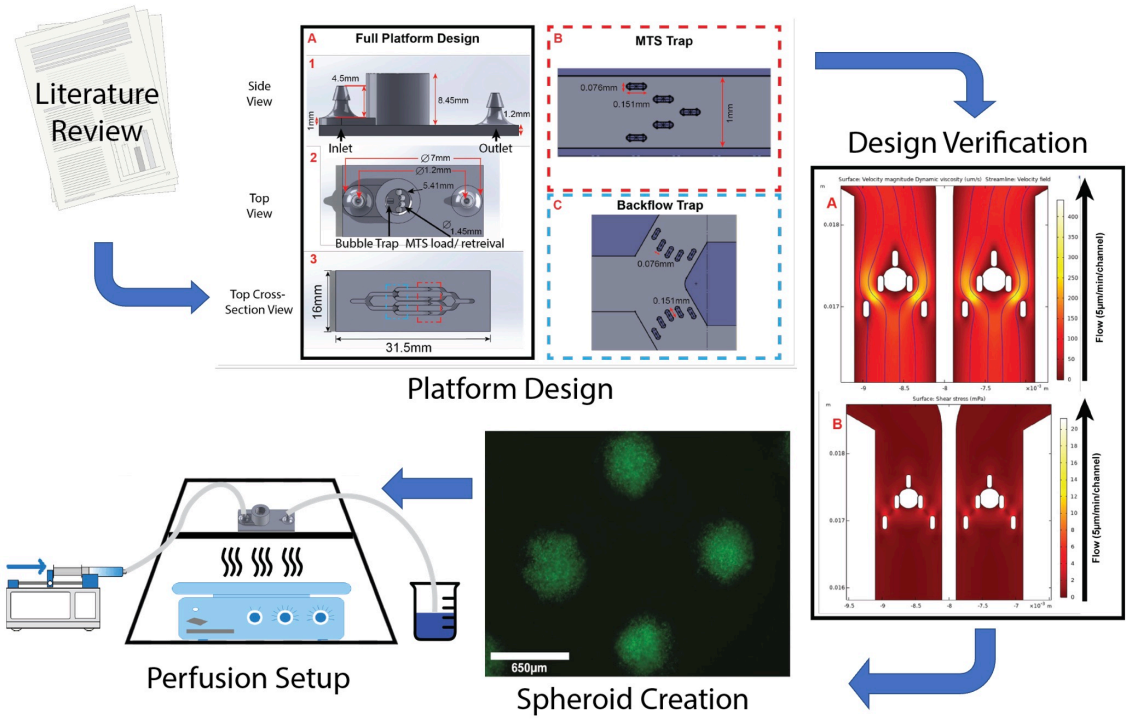
Session A

Cancer Technologies

Multiplexed Microfluidic Analytical Platform (M-MAP)

Team 14: **Benedek Gyuris, Patra Hsu**
Advisor: **Alex Markoski, Jeffrey T. Borenstein (Draper: A BTEC Sponsor)**

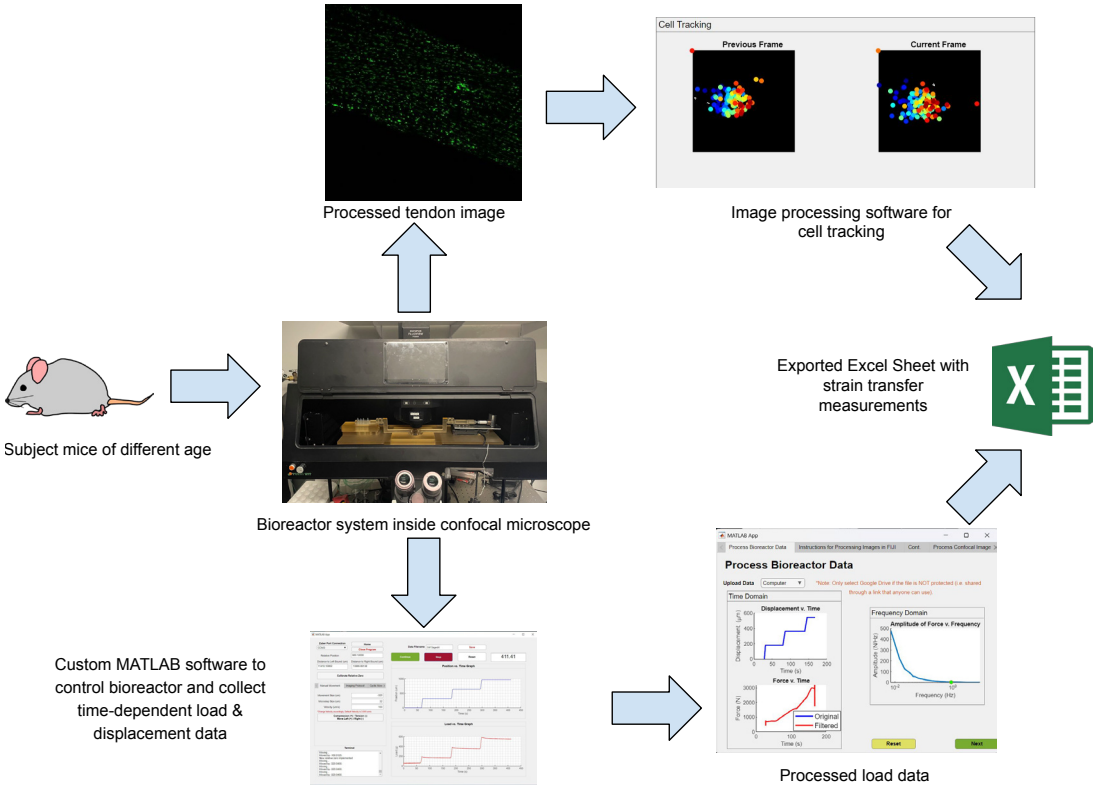
An in-vitro tumor model that behaves similarly to in-vivo tumor tissue is essential for the development of targeted cancer therapies and treatment plans. 2D models have been the standard for pre-clinical studies in the past; however, studies show that they lack translatable models of tumor microenvironments. 3D multicellular tumor spheroids (MTS) models are a more accurate model due to similar interactions of cell architecture and oxygen gradients found in-vivo. However, they need constant perfusion of nutrients in the extracellular matrix (ECM) to sustain the viability of deeper cell layers for determining the efficacy of cancer therapies. A single-channel additive-manufactured monolithic device developed by Markoski et al. (2021) pioneered a biologically compatible platform design with 3D printable microfeatures for the sustainment and research of MTS. However, drug development calls for high throughput alongside replicable experiments, and consequently, there is a need for a multiplexed design that would allow for the standardization of multiple samples testing under uniform conditions. A four-channel device was then designed from a literature review within the last decade and of prior work and then successfully fluidically validated through COMSOL simulation. Prior MTS creation and imaging procedures were updated for regularity and an affordable perfusion setup was prototyped to prepare for physical biological validation of the platform via the insertion of created MTS. Ultimately, this multiplexed 3D spheroid-optimized platform has potential to broaden the accessibility of tools for drug development research and opens new directions in the fields of affordable personalized medicine and oncology.



Age-Related Differences in Strain Transfer Mechanisms from ECM to Cell

Team 17: **Nick Mauro, Zewen Zhao**
Advisor: **Brianne Connizzo**

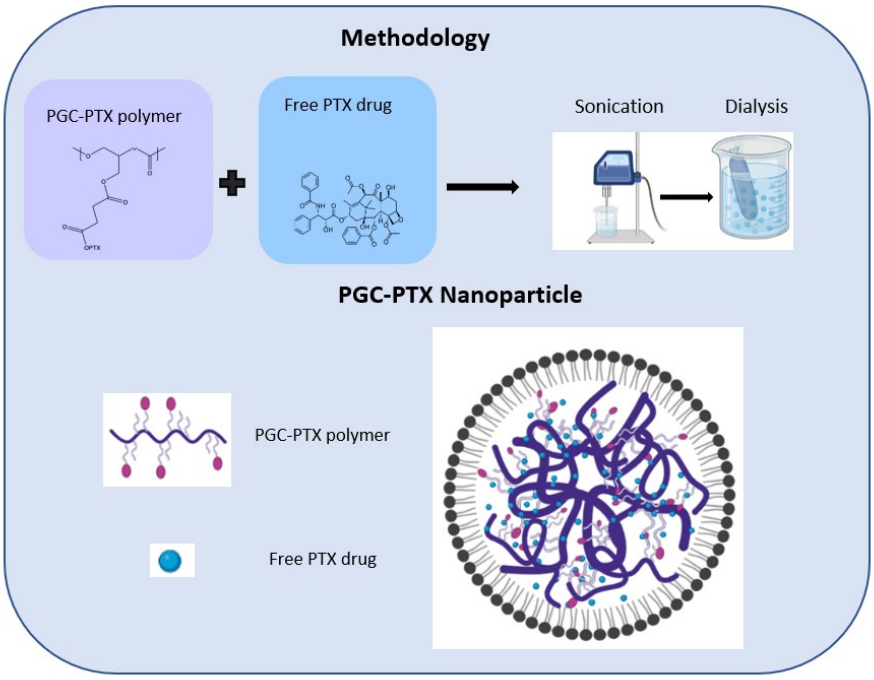
Tendinopathy is a highly prevalent clinical condition mainly caused by overuse or age-related degeneration of tissues. The transfer of strain from the ECM to the cell triggers extracellular matrix (ECM) remodeling. Therefore, a reduction in strain transfer could lead to a reduction in ECM remodeling and ultimately, tissue degeneration. A bioreactor with the capabilities of applying controlled loads and imaging loaded tissues would enable the study of strain transfer at the cellular level. The team inherited previously established hardware and control software for a customized mechanical loading bioreactor, which has the potential to be used in conjunction with the Olympus FV3000 confocal microscope. The team first improved the load reading of the system to be able to distinguish changes of load of at least 10 grams to improve the systems sensitivity. The team then developed a custom program using MATLAB App Designer to track cells and calculate strain transfer between images generated by confocal microscopy. The data analysis software uses image processing and tissue-level displacement data to calculate multi-scale strains and strain transfers. The team then conducted experiments to observe age based differences in mice tendons to demonstrate the effectiveness of the bioreactor system. Utilizing nuclear and cellular staining procedures, the team produced multi-level strain transfer measurements utilizing confocal microscopy and the bioreactor system. Utilizing the bioreactor system will further enable the study of strain transfer within the Conizzo Lab through the combination of real time mechanical loading and fluorescent imaging.



Polymer-Drug Conjugation for Ultra-High Loading Nanoparticles

Team 24: **Alexia Kaloudis, Melissa Gillis**
Advisor: **Mark Grinstaff**

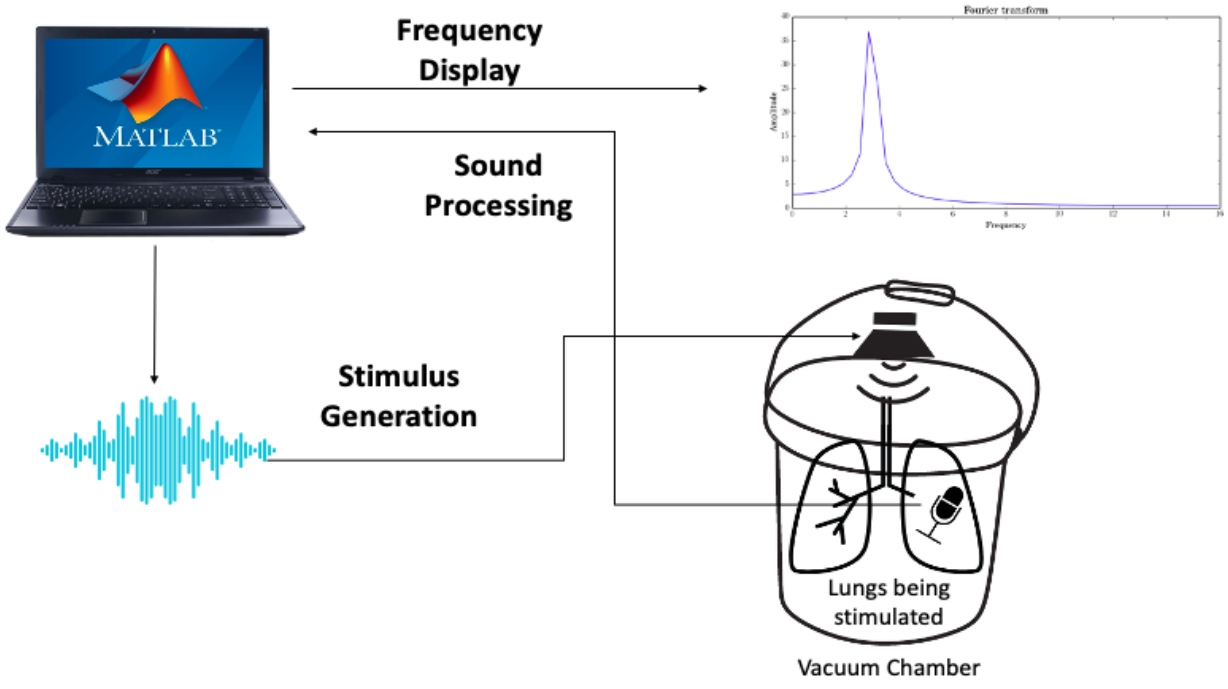
Currently, chemotherapeutic drugs are part of the standard of care for most cancers. However, when chemotherapy is administered only a limited amount reaches the tumor causing toxic side effects throughout the entire body. Nanoparticles have recently been used as a way to target tumor cells and deliver chemotherapeutic drugs directly to the tumor, bypassing the original side effects of traditional chemotherapy. However, these particles are limited in their drug loading capabilities. Previously, a polymeric nanoparticle drug delivery system was developed with the chemotherapeutic drug paclitaxel (PTX) both encapsulated within the particle and conjugated to the backbone of the novel biodegradable polymer: poly (1,2-glycerol carbonate) (PGC). These nanoparticles demonstrated unprecedented high drug loading. We aimed to understand the principles behind ultra-high loading to design nanoparticles for more efficient drug delivery. We hypothesized that the strong pi stacking between aromatic pi bonds of conjugated and encapsulated drugs leads to significantly higher levels of drug loading due to strong drug-drug interaction. We found that PGC-PTX nanoparticles showed significantly higher levels of PTX loading than the control polymer PGC that facilitates less pi stacking. The control drug grazoprevir, which facilitates less pi stacking, exhibited lower levels of drug loading than PTX when encapsulated in both the PGC-PTX and PGC polymers. These results show that pi stacking between conjugated and encapsulated drugs greatly impacts the drug loading capacity of nanoparticles, with stronger pi stacking enabling greater drug loading. With this knowledge, nanoparticles can be designed to provide safer and more effective cancer therapies.



Investigating the Effects of Pulmonary Diseases on Lung Acoustics as Potential Diagnostic Biomarker

Team 34: **Alex Barutis, Dogancan Kuyel, Nicholas Rabines, Samuel Smith**
Advisor: **Hadi T. Nia**

Research has shown that the lungs can exhibit frequency behavior as it acts as a complex mechanical and acoustical system. Furthermore, the lung's acoustics properties have been hypothesized to be influenced by its physical structure and the presence of pulmonary disorders. Hence, this study aims to determine whether the resonance behavior of mammalian lungs can be utilized as a diagnostic biomarker for pulmonary diseases. A novel experimental methodology was developed to stimulate mammalian lungs inside a negative pressure chamber by outputting audio frequencies to the trachea. The recorded signals were analyzed in the frequency domain using MATLAB. Subsequently, the lungs were exposed to abnormal physical conditions, simulating the effects of pulmonary disorders, and altering their physical properties. The results demonstrated that the lungs exhibited characteristics akin to a Helmholtz resonator. Furthermore, the healthy and diseased lungs displayed distinct resonance behaviors, suggesting that the acoustic properties of the lung could serve as a potential diagnostic biomarker for pathological states. This finding bears significant implications for pulmonology, as it may facilitate pulmonary disorder detection, prompting more accurate diagnoses and reducing misdiagnosis rates. The study's results expand the literature on the acoustic behavior between healthy and diseased lungs, opening the possibility for the development of a medical device capable of identifying pulmonary illnesses through minimally invasive testing by analyzing the lung's resonance behavior. The introduction of a unique diagnostic method via the lung's acoustic properties could provide clinicians with a valuable tool to enhance patient care while advancing lung health technologies.

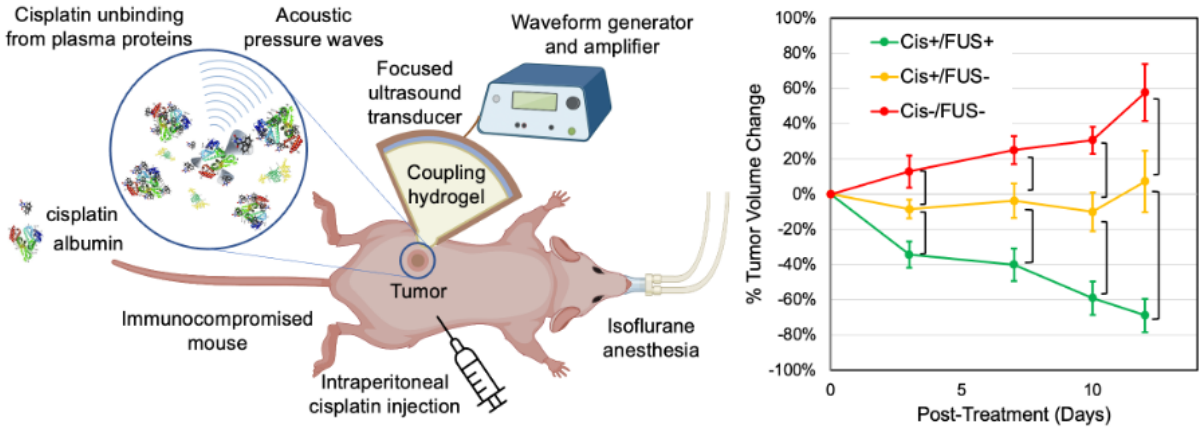


Boosting the Chemotherapeutic Effect of Cancer Drugs using Focused Ultrasound (FUS)

Team 29: **Jason Gashi, George Katsarakes**

Advisor: **Seung-Schik Yoo (Brigham and Women's Hospital/ Harvard Medical School)**

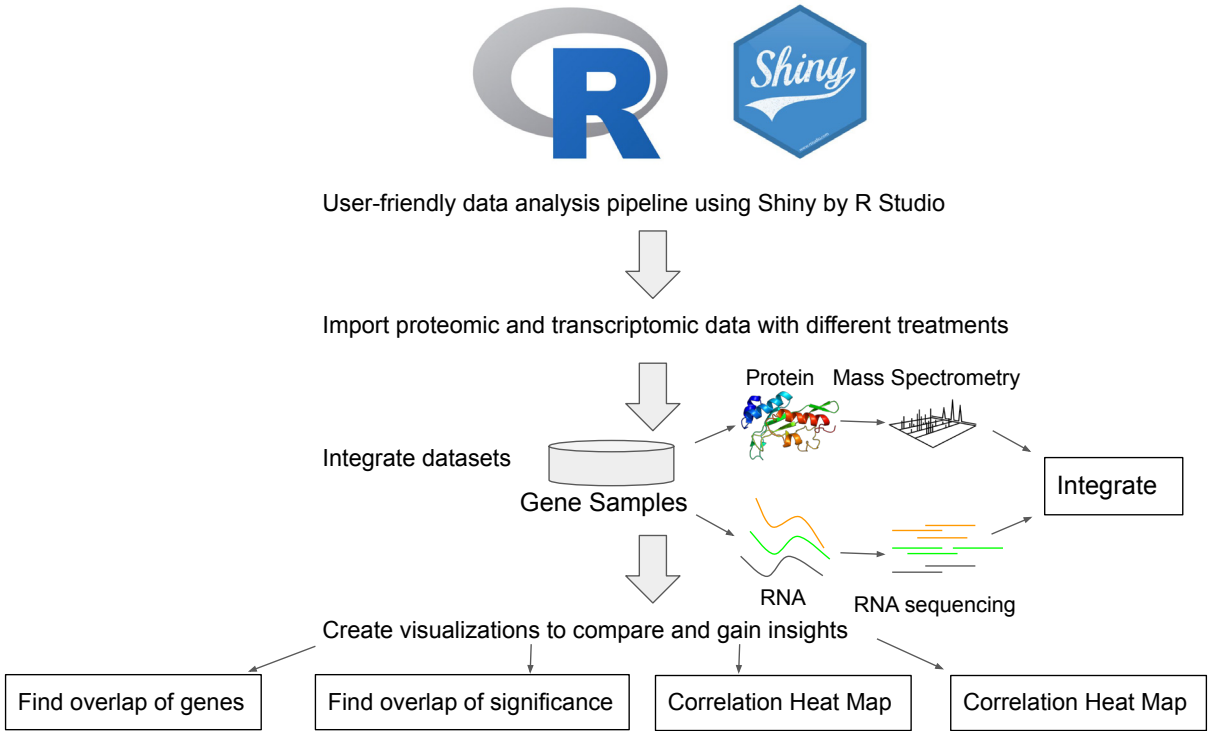
Many types of drug molecules bind to blood plasma proteins such as albumin and alpha 1-acid glycoproteins. This binding is rapidly reversible and occurs through weak (on the order of piconewtons) molecular-level interactions. When binding occurs, the resulting drug-protein complexes are sequestered in the bloodstream, profoundly reducing effective drug delivery. One potential solution to improve drug delivery is to increase the systemic dose. However, this approach has drawbacks for chemotherapy agents, where higher doses are often associated with serious side effects. This warrants a new technique that can increase the unbound concentration of a chemotherapy drug with spatial selectivity in order to isolate the effect to the targeted tumor mass. Research has shown that low-intensity focused ultrasound (FUS) produces nonionizing mechanical radiation forces that can temporarily disrupt plasma protein binding (PPB), locally increasing unbound drug concentration. Using a murine xenograft model, we applied this technique to unbind cisplatin, a chemotherapy drug that binds to albumin at a rate of over 95%, in order to examine if FUS can enhance the delivery of unbound cisplatin to cervical cancer and thus boost treatment efficacy. We found that a combination of cisplatin and FUS caused a significant reduction in tumor volume compared to the use of cisplatin alone. This study provides the first evidence that FUS offers unprecedented improvements in the non-invasive enhancement of chemotherapeutic agents with high PPB. This technique may allow for the use of lower systemic doses (and thus reduced side effects) to yield equivalent treatment outcomes.



Software Generation for Visual Analysis of Multiomic Data

Team 7: **Isha Havale, Owen Murray, Kevin Panaro, Jarod Zizza**
Advisors: **Katelyn Cassidy, Nicole Follmer, Bridget Kreger (C4 Therapeutics, a BTEC Sponsor)**

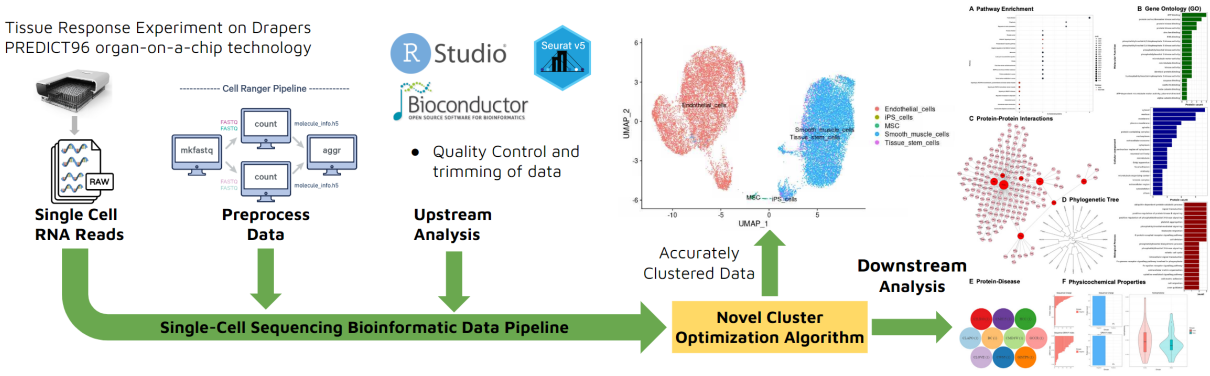
Targeted protein degradation (TPD) involves the design of small molecules that co-opt ubiquitin-protein ligases to tag proteins of interest (POI) for destruction by the proteasome. To improve understanding of degrader mechanism of action, researchers at C4 Therapeutics (C4T) collect both transcriptomic and proteomic data sets via RNAseq and mass spectrometry, respectively. Transcriptional changes and protein levels rarely have a 1:1 correlation, meaning comparing RNA-seq and mass spectrometry data gives a fuller picture of the biology being perturbed with TPD. Currently, C4T does not have a way to produce multiomic data visualizations to compare RNA transcripts vs. proteins in a robust manner, which hampers the understanding of degrader-induced biology. To solve this issue, this project created a Shiny application in R Studio to automate the data integration process and greatly enhance multiomic analysis. The software receives the data sets as Excel file inputs and produces different downloadable visualization outputs, based on user-selected fold-change cutoff. Available tools are a correlation heatmap, a correlation dot plot, a gene overlap Venn diagram, and a gene significance Venn diagram. The correlation visualizations display the overall relationship between transcriptomics and proteomics, while the Venn diagrams highlight specific genes of interest. Program success was benchmarked by beta tester feedback across the Proteomics and Targeted Biology departments of C4T, where 4 out of 5 users reported it made multiomics analysis easier.



PREDICT96 Data Analysis Pipeline

Team 13: **Sumner Warden, Stephen Sweet, Jeevith Chandrasekar, Jin San Yoon**
Advisors: **Corin Williams, Jenny Walker, Rob Gaibler (Draper: A BTEC Sponsor)**

PREDICT96 is a single organ system that allows for researchers to analyze the interactions between tissues and compounds through gene expression analysis. This system requires a high throughput system for the analysis of RNA sequencing to understand the changes to gene expression as a result of the compound and the tissue interaction. We have developed a pipeline for both single-cell and bulk-cell RNA sequencing, training it with experimental data from open-source platforms such as the NIH and later testing it with experimental data from Draper Laboratories. The initial steps of development began with preprocessing the RNA-seq data using Cellranger and Seurat packages to generate gene-level counts. The data was then filtered to remove low-quality cells based on multiple quality control metrics and performed PCA and t-SNE dimensionality reduction. Then the data was analyzed through the use of findmarkers by timepoints and by cluster comparison. Additionally the human data was clustered using a clustering loop and optimization to gain summary figures such as top genes and clusters, heatmaps, and ggplots. This data was then used for downstream analysis of the human data using multiple analytic approaches. Finally, a cross-comparison of the human data to rat data was conducted to start the development of a vascular atlas – an integrated public database for analysis of PREDICT96 output. This pipeline allows us to understand connections between differentially expressed genes and their associations with known diseases and for increased accuracy of the PREDICT96 device in commercial settings.



Track 2

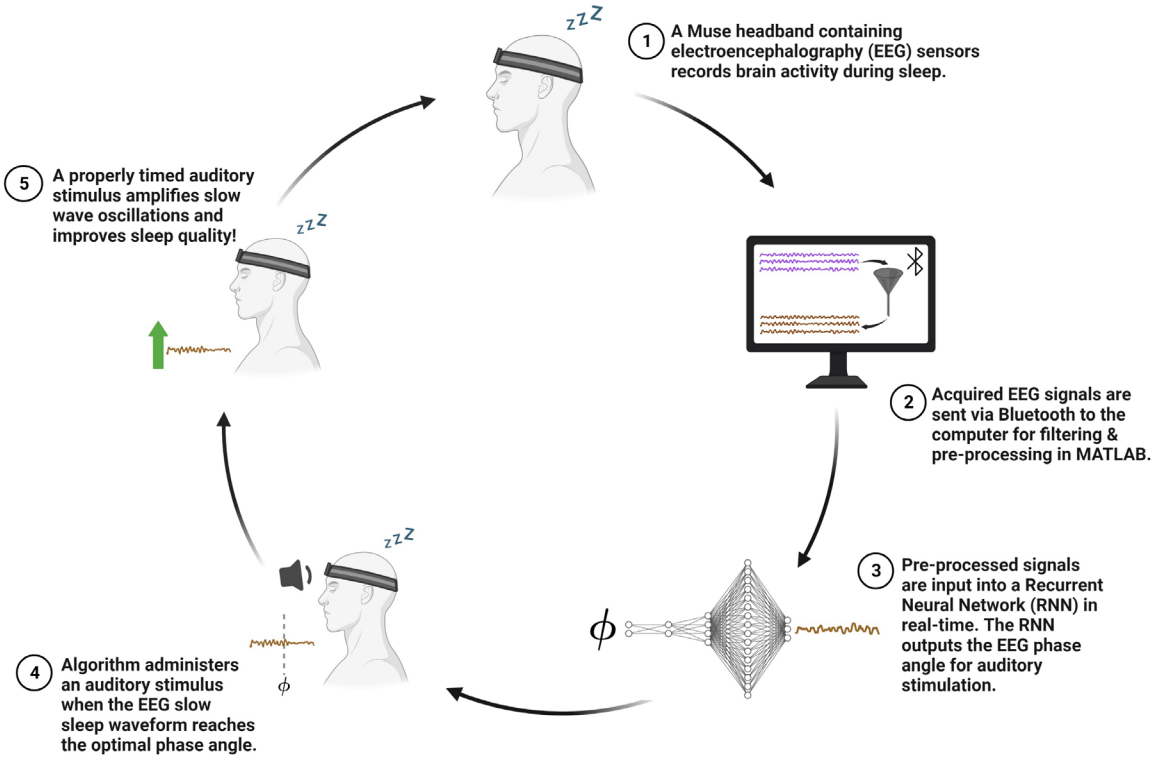
Session B

Digital and Predictive Medicine

Software for Closed-Loop Neurofeedback

Team 11: **Emma Hartman, Yuhan Li, Yuke Li, Wei-Fang Liu, Yongjun Lu**
Advisors: **Len Jacob, Josh Levitt, Laura Lewis**

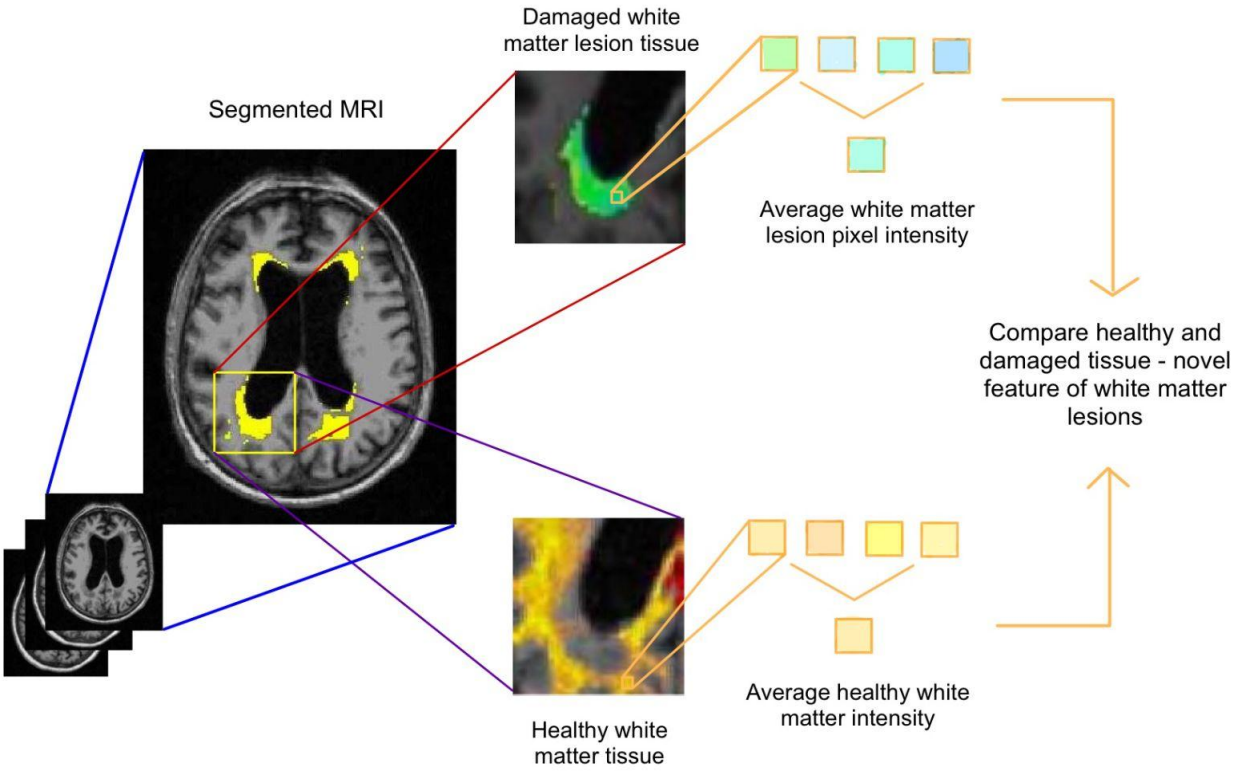
Previous studies have shown that slow wave sleep (SWS) provides many cognitive benefits, including improved memory and sleep quality, as well as a positive impact on many biological processes such as glucose metabolism, hormone release, and immunity. Furthermore, prior research suggests that introducing auditory stimulation in phase with these slow waves effectively increases their magnitude, amplifying their beneficial effects. We aimed to develop a MATLAB algorithm that built upon this research by using appropriately timed sound stimulation to enhance users' quality of sleep when paired with a commercially available electroencephalography (EEG) headset. While similar research-grade software exists, this algorithm is intended for use in a home environment. We connected a MuseS EEG headband to our MATLAB computer application via a Bluetooth connection with a sampling rate of 256 Hz. We then collected preliminary EEG data to train a Recurrent Neural Network (RNN) to predict the phase angle of slow wave oscillations in real-time. After conducting a literature review, we theorized that the RNN architecture was most conducive to this goal due to its ability to process sequential data in a feedback loop, thus allowing us to identify slow waves and examine phase changes in acquired EEG data. After training and optimization are complete, we will use our RNN model to predict and deliver an auditory stimulus in phase with identified slow waves so as to enhance their magnitude. We will analyze our results by calculating the amplitude of error for our predicted phase angles via a polar histogram method.



White Matter Lesion Quantification from Structural Brain Images

Team 37: **Alexandra Dolynuk, Aurelia Leona, Farida Korna, Kfir Flank, Soumaya Fayie**
Advisors: **Barnaly Rashid, David Salat (Niji Neuro Corp)**

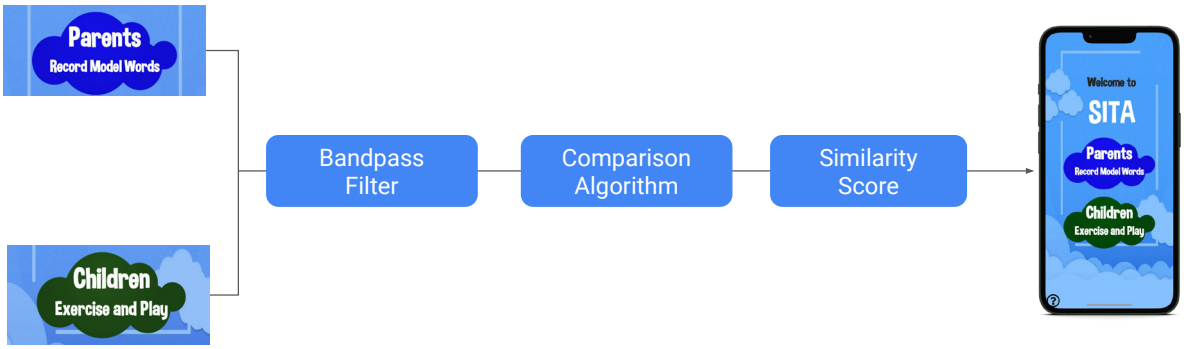
White matter lesions (WMLs) are areas of abnormal myelination in the brain due to lack of blood flow. WMLs, a characterization of vascular disease, have an extreme effect on the functionality of the brain and are often left out as a variable when studying Alzheimer's disease (AD). However, compared to other biomarkers, these vascular damages can be used as an early indicator of AD. Alzheimer's disease is a devastating disease that causes progressive degradation of mental functionality and daily-life physical capabilities. Unfortunately, there is no cure for AD, and the degeneration of the brain cannot be reversed. Cognitive impairment due to WMLs can be imaged through the use of magnetic resonance imaging (MRI). However, existing software is limited to visual segmentation and numerical volume measurements, which are not sufficient to feed predictive models that can accurately predict the rate of cognitive symptom progression in AD patients. The aim of our project is to quantify additional features of WMLs, such as mean intensity, standard deviation, and Mahalanobis distance. These features will be fed into predictive models to predict the rate of progression of cognitive symptoms in AD patients. This is critical for increasing the accuracy of predictive models and improving earlier and more accurate diagnoses of AD.



Interactive Speech Therapy Application for Children with Autism Spectrum Disorder

Team 15: **Aida Berbarian, Emily Boyce, Jason Lipari, Ashraye Vallabhaneni**
Advisor: **Andrey Vyshedskiy (ImagiRation, LLC; BU MET)**

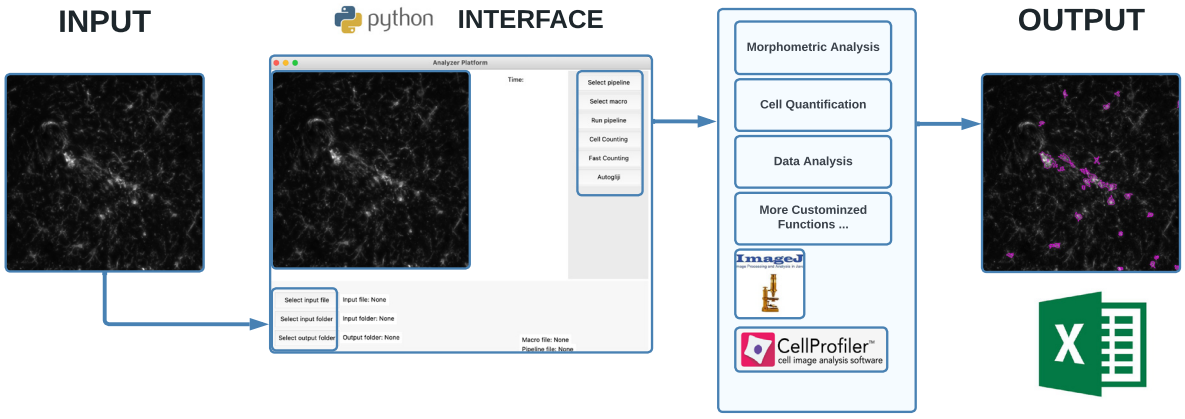
Current speech therapy applications largely neglect nonverbal and minimally verbal users. In order to create an application for this audience, a comprehensive algorithm capable of speech recognition tailored for minimally verbal users is necessary. This is often difficult, as the inflections and speech patterns of nonverbal/minimally verbal users vary widely and are oftentimes troublesome for existing speech recognition algorithms. Our team
designed an algorithm meant to replace the previous algorithm used in the beta version of the SITA application after we tested it and decided it was insufficient. Testing consisted of using different variations of the model word, testing with different speakers, testing with different background noise levels, different sample rates, etc. The new algorithm is able to compare a model recording of a word to a recording of the user repeating the same word, and return a score that represents the similarity between the two audios. This algorithm takes the two audio recordings as inputs, filters out noise, and evaluates each audio before outputting the similarity between the two on a scale of 1 to 100, allowing nonverbal/minimally verbal users or their guardians to monitor progress as a supplemental tool to speech therapy. The new algorithm went through a similar series of testing as the previous version. Using statistical analysis, we found that the new version was an improvement to the beta version.



Integrated Platform for Cell Quantification, Morphometrics, and Statistical Analysis

Team 21: **Chenkai Yao, Kevin Yuyang Kang (ECE)** **INTERDISCIPLINARY**
Advisor: **Tuan Leng Tay, (BU Biology, Anatomy & Neurobiology)**

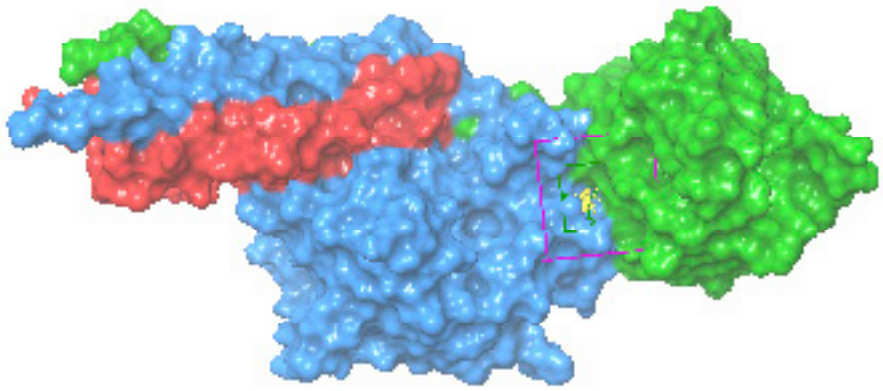
Neuronal cell image analysis is essential for neuroscience research to understand the structure and function of cells and study the effects of neural disorders. Biological digital imaging can generate high quality visualization of micro-size cells and molecules. However, the analysis of digital images can be a daunting task, as it requires extensive manual effort and is often prone to human error. Computational methods have been developed to automate the analysis of cell images. Many open-source image analysis tools were designed to automate the analysis of images and process high throughput datasets quickly and accurately. While many of them are powerful tools for analyzing digital images, they can be limited in terms of interactivity with each other when researchers need to explore and interact with their data in more intuitive and flexible ways. To overcome this challenge, we propose a self-built software platform that integrates computational analysis methods to automate multiple image analysis processes, including cell quantification, morphometric analysis, and data analysis. The platform makes use of shell scripts to access the functions and features of multiple image analysis softwares on Windows and MacOS systems, while also leveraging the interactivity of Python to develop an interface that can integrate the functions of various image analysis software. The platform provides a streamlined workflow that allows researchers to quickly and accurately analyze digital images of cells, without requiring extensive training or technical expertise. In addition, its user-friendly interface and intuitive design make it easy for researchers to visualize and interact with their data in meaningful ways, enhancing their ability to gain insights into the structure and function of the neural system.



Computational Investigation of Peptide Binding to Fibrin for Molecular Imaging of Post-Surgical Abdominal Adhesions

Team 28: **Nicole Ostrovsky, Alisha Ragatz**
Advisors: **Diane Joseph-McCarthy, Joyce Wong**

Abdominal adhesions are bands of fibrous scar tissue that can connect tissues and organs that normally slide across each other. Complications can cause chronic pain, infertility, and many additional therapeutic costs. Current clinical imaging techniques, such as MRI and ultrasound, are ineffective for early detection, so exploratory surgeries are the only method to identify their exact location. Imaging is thus crucial for identifying adhesion location and formation, and for conducting treatment studies. Fibrin is a major component in early adhesion formation and consequently is an attractive molecular target. The goal of this project is to design optimized peptides that bind to fibrin for tissue targeting. Analysis of fibrin binding sites was performed using data from literature and the Protein Data Bank (PDB). A reference fibrin-ligand structure and complex of interest were aligned and visualized in Maestro, a 3D visualization software, to compare peptide binding locations. The fibrin structure was also analyzed in FTMap, a server that locates binding hot spots on the surface of proteins. Unbiased conformers of the peptides were generated and docked in the previously identified hot spots to ensure accurate protocol. The docked conformers also function as a control to compare binding affinities of engineered peptides. The project provides data on peptide-fibrin binding predictions and serves as a foundation to engineer an optimized peptide for tissue targeting. The engineered peptide will provide a basis for further research into a targeted contrast agent to visually detect newly forming adhesions.



Monomer of fibrin structure 1FZG with docking box centered on the largest hot spot cluster (yellow). Structure is colored by chain with the gamma chain in green, beta chain in blue, and alpha chain in red.

Track 2

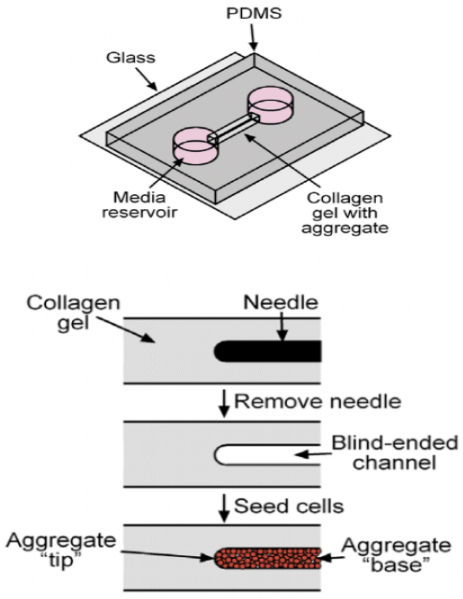
Session C

Synthetic Biology
Cell and Tissue Engineering

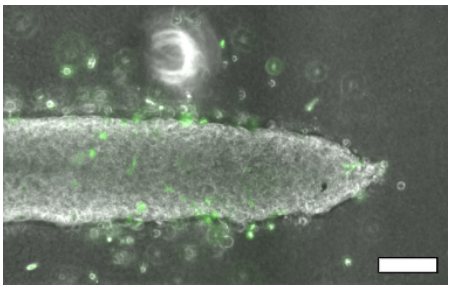
Developing an In Vitro Model of Luminal Breast Cancer

Team 3: **Owen Kelly, Anushka Rathi**
Advisor: **Joe Tien**

Luminal breast cancer originates within the luminal epithelium of mammary breast ducts. These epithelial cells normally express estrogen receptor (ER), and most cases of luminal breast cancer are considered to be ER-positive (ER+). Creating a model for metastatic ER+ breast cancer, in which cancer cells migrate from the original tumor, travel through the vasculature, and form a new tumor elsewhere, may enable the development of more effective treatment of luminal breast cancer. Currently, few models of metastatic progression of ER+ breast cancer exist. The goal of our project is to engineer an in vitro model, using human breast cancer cell lines, to characterize the first two steps of metastasis in ER+ breast cancer, specifically invasion of the cells into the extracellular matrix (ECM) and escape of the cells from the ECM into vasculature. To create this model, we altered a needle-based approach that was originally developed for triple-negative breast cancer (TNBC). Because ER+ cells are less invasive than TNBC cells are, we modified our model to achieve more aggressive invasion for ER+ cells. These modifications consisted of 1) optimizing the collagen concentration in the model, and 2) introducing a small (1%) sub-population of TNBC cells with the ER+ cells to enhance the invasiveness of the latter.



Tien J, et al. *PLoS One*. (2012)

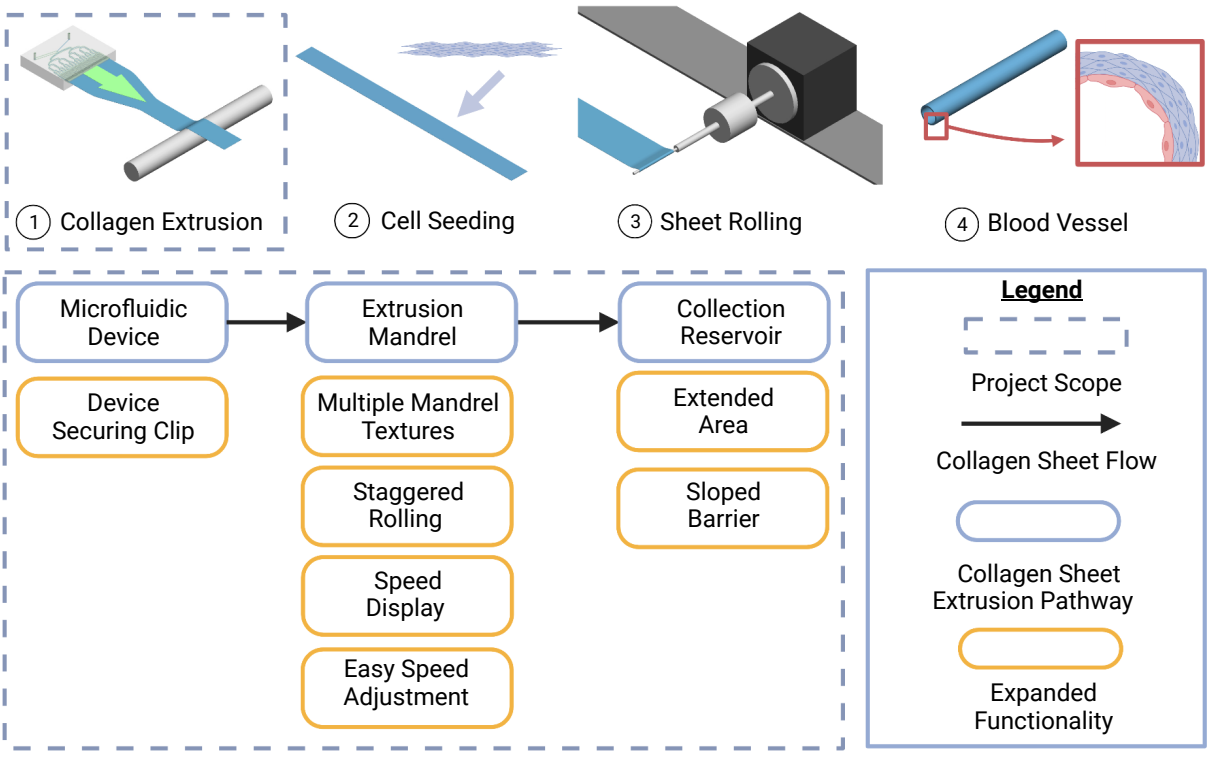


Guide:
Green cells: GFP+ triple-negative breast cancer
White cells: ER+ breast cancer
Scale bars 200 μm

Design of a Streamlined Tissue Engineered Blood Vessel Bio-fabrication Platform

Team 6: **Drew Aggarwal, Connor Brashears, Daniel Ludwiszewski, Anh Duy Nguyen, Shawn Xu**
Advisor: **Richard Cheng (Chaikof Lab - Harvard Medical School/Beth Israel Deaconess Medical Center)**

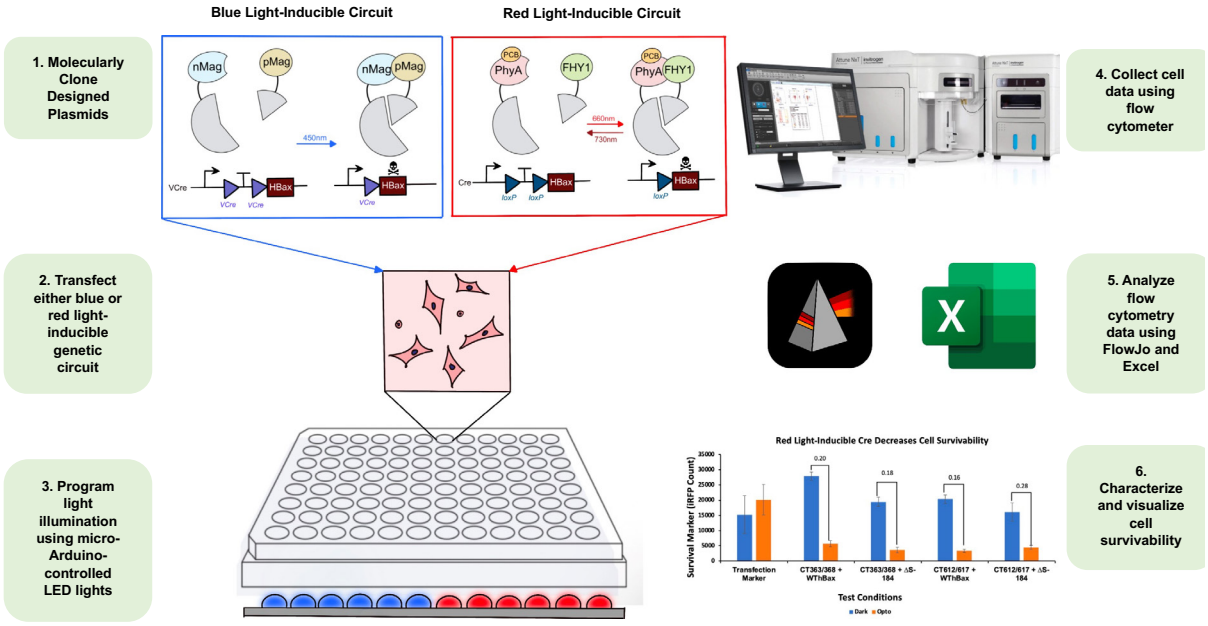
Blood vessel grafts are the fundamental component of coronary artery bypass surgery, a common operation used to treat coronary artery disease. Current standard of care involves either grafting an unneeded blood vessel from elsewhere in the body, or utilizing an artificial vessel composed of synthetic biomaterial. While effective in the short term, repurposed vessels often undergo stenosis over time, dangerously reducing blood flow. Similarly, synthetic materials carry a risk of thrombus development. Tissue engineered blood vessel grafts (TEBGs) demonstrate promise in replacing these treatments as they pose reduced risk of stenosis and thrombus development. Additionally, TEBGs act as living conduits which grow and develop with the patient. However, the potential of TEBGs is greatly limited by existing fabrication processes. Current biofabrication platforms involve technical and laborious work to obtain few vessels with minimal capabilities. The process requires constant monitoring and manual manipulation to ensure that the extruded collagen sheets maintain their integrity. Therefore, current platforms are ineffective for high-throughput research. Our proposal directly addresses this as it targets TEBG development for research instead of clinical use. We propose to expand functionality and streamline the current process of biofabrication to improve efficiency and bolster research capabilities. As a result, TEBG research will be broadened and accelerated, allowing its life-saving clinical applications to reach patients sooner.



Expanding the Optogenetic Toolkit through the Development of Light-inducible Phenotype Switches for Multiplexed Control of Gene Expression

Team 25: **Vinaya Akavoor, Jenny Deng, Jeannine Tong**
Advisor: **Cristina Tous, Wilson Wong**

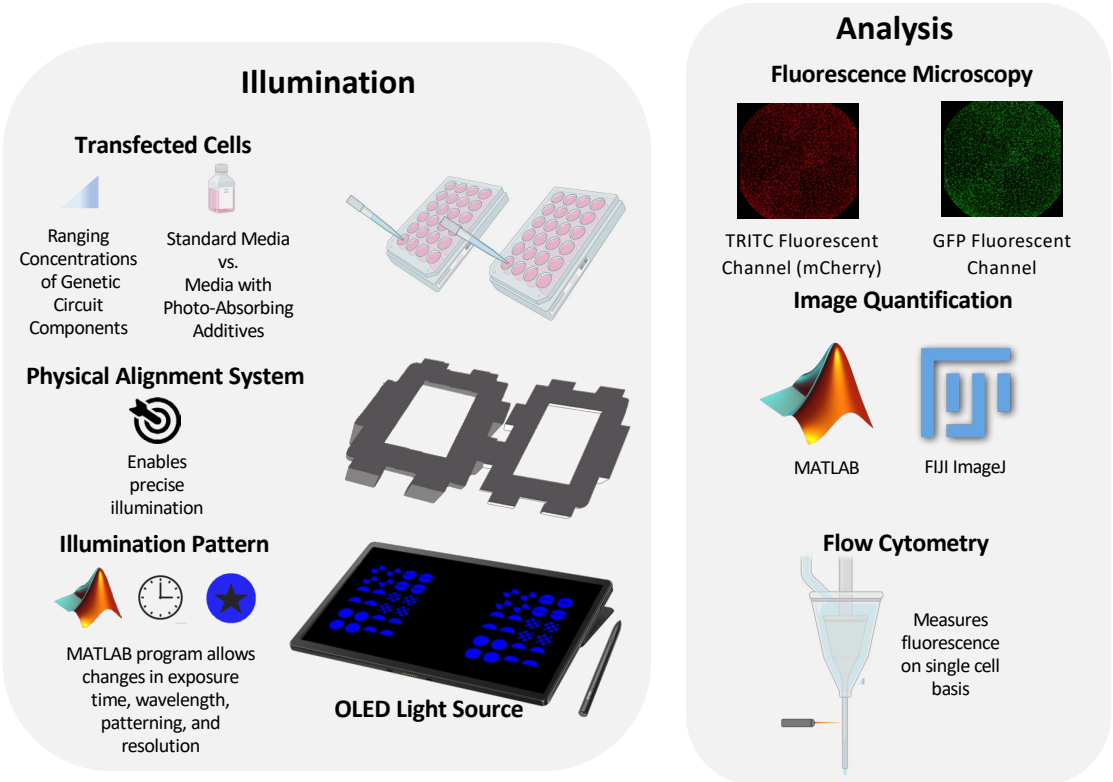
Site-specific recombinases are powerful genetic engineering tools that can recognize short, specific nucleic acid sequences and can excise, invert, or insert other DNA sequences. Engineering these recombinases with light-inducible domains will confer better spatiotemporal control of gene expression than previous chemical-inducible systems. Utilizing these concepts, we designed photoactivatable genetic circuits that activate an apoptotic gene, HBax, upon blue (450nm) or red (660nm) light illumination. We molecularly cloned 20 plasmid constructs (16 split recombinases and 4 HBax-containing targets). Natively, these engineered light-inducible recombinases are split in half: the N-terminus half is attached to one domain of the light-inducible system and the C-terminus half is attached to the other half of the light-inducible system. In the presence of light, the two halves recombine, reconstituting the catalytic abilities of the recombinase that allow it to recognize and activate the expression of HBax. We transfected this system into plates of human embryonic kidney cells (HEK293), illuminated these plates with micro-Arduino-controlled LED lights, and measured the amount of infrared fluorescent protein, a marker of cell survivability, using flow cytometry. We then analyzed this flow cytometry data using FlowJo and Excel. We observed that some genetic circuits reduced cell survivability by over 50%. Future work can improve these systems by reducing the basal activity of split recombinases, optimizing temperature pulsing for the blue-light system, and increasing the applicability and translational impact of this system by testing in other mammalian cell lines, potentially in conjunction with immunotherapy technologies, like CAR-T.



Leveraging Optogenetics for the Development of Tissue Patterning

Team 33: **Gabriela Berniac, Richaa Kalva, Miguel Mazumder**
Advisors: **Wilson Wong, Ian Kinstlinger**

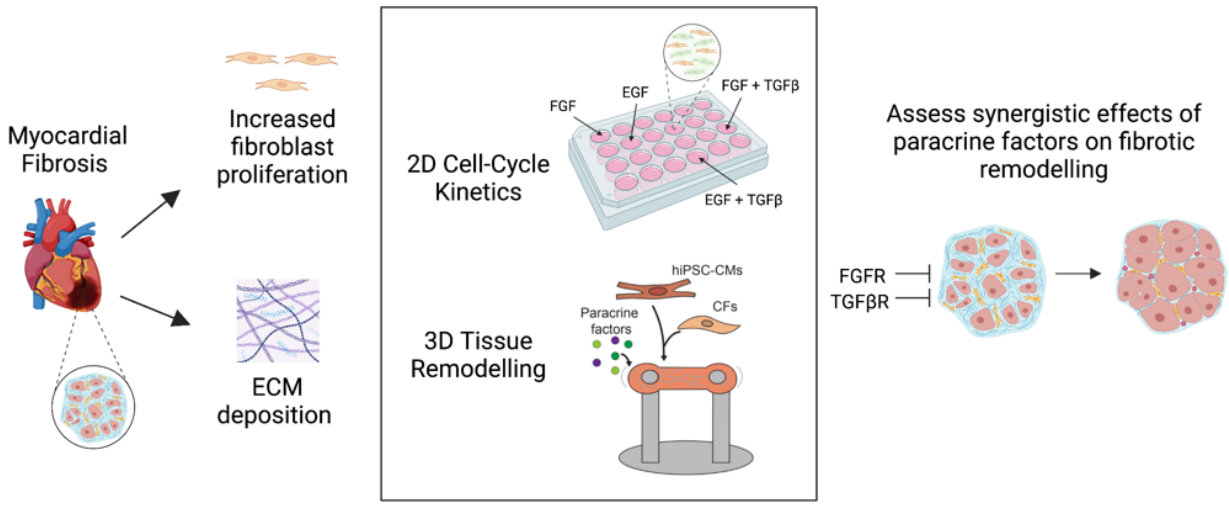
Optogenetics, the use of light to control gene expression, is already widely used in scientific experiments and has enormous potential for future applications in regenerative medicine. Currently, we are focused on applying light-inducible recombinases for the development of tissue patterning. We are designing a programmable device that produces illumination patterns to stimulate light-responsive genetic switches in mammalian cells. Current illumination systems lack spatiotemporal precision due to phenomena such as light scattering. Our prototype utilizes organic light emitting diode (OLED) technology as a cost-effective and energy-efficient alternative, using the ASUS VivoBook 13 OLED tablet as the model illumination source. A physical alignment system is created through CAD software and 3D printed using PLA filament for precise and spatially regulated illumination. Together, these hardware components enable high-resolution illumination with improved brightness, contrast, and precision compared to existing models. The software component is developed in MATLAB with a graphical user interface (GUI) for user input of the desired exposure time, light wavelength, pattern type, and resolution of the generated image. Data analysis is performed using flow cytometry, fluorescence imaging, and image quantification to characterize the successful light-activation of recombinase switches in transfected cells. Future studies will continue to investigate whether using red light, which has previously been shown to increase biocompatibility, will improve the efficiency of tissue patterning.



High-throughput *In Vitro* Assessment of Paracrine Factors in Cardiac Fibrosis

Team 35: **Artemis Margaronis, Medha Shekhar**
Advisors: **Jourdan Ewoldt, Anish Vasan, Jeroen Eyckmans, Christopher Chen**

Myocardial fibrosis, the pathological buildup of extracellular matrix (ECM) after cardiac injury or disease, can disrupt tissue healing and function as the damaged heart undergoes repair. This pathological remodeling increases collagen production and the formation of stiff scar tissue, causing the heart to pump less efficiently over time. Fibrosis is mediated through the activation of fibroblast cells, increasing their proliferation and ECM deposition. While fibroblasts are often activated in response to injury and disease due to cell signaling from paracrine factors secreted by injured parenchymal cells and immune cells, the specific effects of individual paracrine factors on cardiac fibroblasts are not well understood. We hypothesize that some paracrine factors associated with fibrosis only activate cardiac fibroblasts in the presence of additional paracrine factors. To address this gap in literature, we developed an in vitro microtissue model to study the synergistic effects of fibrosis-associated paracrine factors: Transforming Growth Factor Beta (TGF-β), Epidermal Growth Factor (EGF), and Fibroblast Growth Factor (FGF), on fibroblast activation. We characterized the isolated and combinatorial effects of TGF-β, EGF, and FGF on fibroblast proliferation, the kinetics of cell-cycle progression, and ECM deposition and remodeling. Our findings show that unlike EGF, TGF-β and FGF alone do not significantly enhance fibroblast proliferation and fibrotic remodeling, but they do in combination, indicating that synergy between these factors contributes to their roles in fibrosis. By characterizing the role of these paracrine factors in the fibrotic process, we provide insight into potential improved therapeutic targets to treat fibrotic remodeling after cardiac injury.

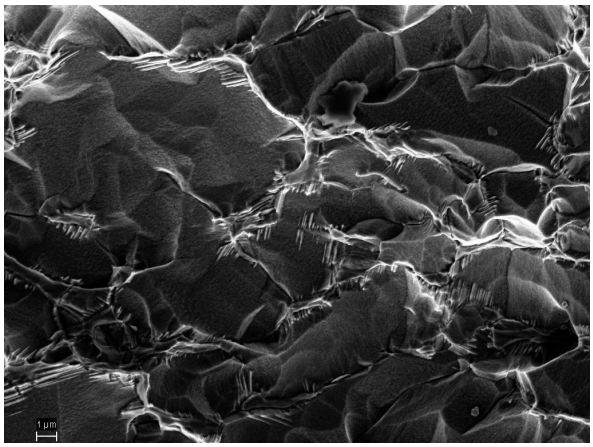


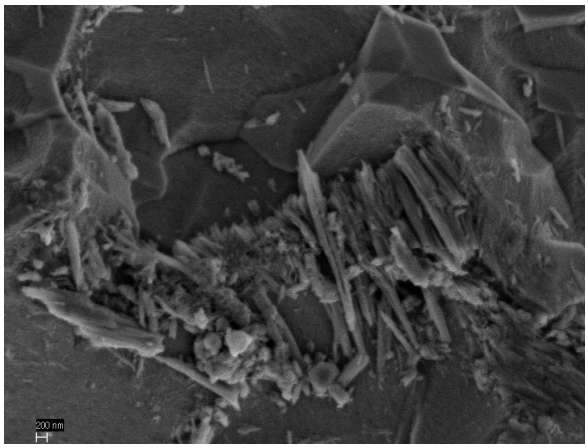
Projects Previously Presented

Bactericidal Topology for Medically Implantable Device Surfaces

Team 8: **Mia Metni, Ann Rizos, Robert Henderson, Vaibhavi Hansrajani, Gus Betts-O'Rourke**
Advisors: **David Bealka, Alexander Samaha (DePuy Synthes)**

Subclinical infections as a product of biofilm development can lead to tissue colonization, posing a concern for the health of patients and the survival of implants. Thus, an effective antibacterial implant surface topography would have applications in addressing the prevalence of implant-related infections. Project Spear is developing a novel technique for the inhibition of bacterial biofilm formation on bone-interfacing medical implant surfaces using rod-like nanotopography. Project Spear is leveraging a solvothermal method to produce titania features on the same Ti6Al4V substrate used in many medical devices. The use of relatively inert titania provides the opportunity for a highly efficient antibacterial surface with high biocompatibility while retaining the mechanical and chemical properties that make titanium alloys attractive materials for implants. Project Spear's research has focused on replicating surface topographies previously formed on pure titania substrates on the thin titania layer found on titanium alloy implants. In order to accomplish this goal, synthesis parameters were varied including solvent, titania concentration in solution, solvothermal synthesis time, and pH of solution. The produced surfaces were then characterized using optical and field emission scanning electron microscopy. While small areas with the desired nanotopography have been produced, Project Spear has not found synthesis parameters that prevent the highly acidic nature of the synthesis solution necessary for nanotopography with the desired orientation from compromising the underlying titanium alloy substrate.

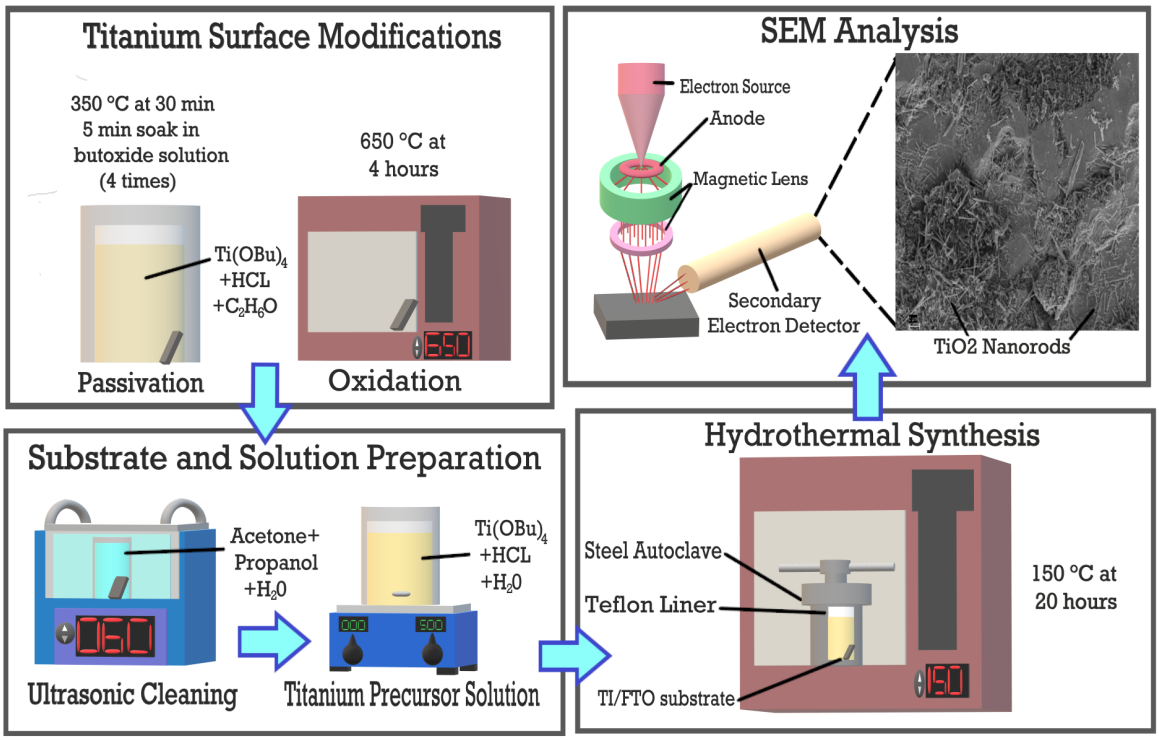




Project Javelin - Titania Nanorods

Team 9: **Andrew Finebaum, Tomer Kushner, Christo Pulickal, Cristopher Coco**
Advisor: **David Bealka, Alexander Samaha (DePuy Synthes)**

Pedicle screws are frequently used in osteoporotic patients who have undergone spinal fusion surgery. Bacterial biofilm development causes loosening of pedicle screws which have been associated with negative outcomes for patients. Previous methods have described the hydrothermal synthesis of a nanorod topology on metal substrates that punctured bacterial membranes and reduced biofilm adhesion. However, the substrates used in these methods are not biocompatible and are therefore unviable for clinical use. Here, we utilize similar hydrothermal synthesis techniques to create a titania nanorod topology that has similar antibacterial characteristics on a titanium (Ti-6Al-4Va) substrate. To begin, a titanium substrate was immersed in an acidic solution containing a low concentration of titanium butoxide. This solution was then placed into a Teflon liner within a stainless-steel autoclave and was heated in a muffle furnace to conduct the synthesis. The impact of surface treatments (thermal oxidation and passivation) on the titanium substrate was also studied to determine the effects on corrosion resistance. Post-synthesis, we utilized scanning electron microscopy to resolve for nanorod characteristics. These nanorod characteristics were quantified through measurements using ImageJ to determine if ideal nanorod characteristics were achieved. From our experiments, it appears titanium surface modifications without hydrothermal synthesis yielded optimal nanorod formation on a titanium substrate. Future experimentation can alter parameters such as time and temperature to observe the impact on nanorod formation. Our results open up the possibility for implementation of these altered substrates in in-vivo murine orthopedic models to characterize their antibacterial efficacy.



SENIOR
DESIGN
PROJECTS
CONFERENCE

2023

Student Resumes

BU Department of Biomedical Engineering

Drew Aggarwal

drewaggarwal@gmail.com • (781) 531-5577 • https://www.linkedin.com/in/drew-aggarwal-4a273b164/ • Wellesley, MA

Education

Boston University College of Engineering — **Boston, MA**
Bachelor of Science in Biomedical Engineering — Expected May 2023
GPA: 3.7/4.0 | Dean's List | Cum Laude
Member of Biomedical Engineering Society

Work/Project Experience

Mass General Brigham – Brigham and Women's Faulkner Hospital — **Boston, MA**
Unit Service Technician – Emergency Department — January 2023 – Present

- Provided broad range emergency-care to patients including EKG, phlebotomy, and orthopedic splint application under the supervision of physicians and nursing staff
- Assisted advanced care providers in coordinating patient care workflows

Chaikof Lab of Harvard Medical School and Beth Israel — **Boston, MA**
Biomedical Engineering Senior Project – Design of a TEBV Bio Fabrication Platform — October 2022 – Present

- Redesigned existing bio fabrication platform improving reliability, efficiency, and uniformity using established parameters for high throughput research purposes
- Produced novel blood vessel grafts by modulating fabrication parameters, testing for materials organization, bulk mechanical properties, and vascular cell distribution

Boston University Emergency Medical Services — **Boston, MA**
Lead Instructor – Emergency Medical Services, CPR, First Aid — November 2021 – Present

- Instructed students didactically on operational and clinical knowledge in accordance with National Registry approved curriculum and ECSI CPR/FA practices
- Evaluated student readiness for national, state, and university EMS examinations by expanding on existing curriculum and administering comprehensive scenario-based assessments

Transformative Healthcare – Fallon EMS — **Greater Boston, MA**
Captain — January 2022 – August 2022

- Commanded largest ambulance base in the metropolitan division and oversaw deployment of ALS, BLS, HazMat, medical transport, and special operations resources across response area
- Commanding officer of approximately 30 employees including 3 sergeants/team leads
- Operated as a field supervisor for general operations, emergent situations, and special events

Field Training Officer — December 2021 – August 2022

- Instructed new hires and EMT candidates in field duties in accordance with protocols outlined by the Massachusetts Office of Emergency Medical Services and internal guidelines
- Developed supplemental education material to bolster candidate knowledge and improve the quality of the organizational training schema for improved candidate outcomes

Emergency Medical Technician — October 2019 – August 2022

- Provided rapid, high-quality emergency medical care and transport to general population of Greater Boston, MA, including municipalities Brookline, Newton, Dedham, and Milton
- Transported patients of low to critical acuity levels between healthcare facilities and frequently interacted with major MA hospital systems such as MGB, BI-Lahey, BMC, UMass, and Stewards

Tend Health — **Wellesley, MA**
Junior Operations Intern — April 2021 – August 2021

- Analyzed market opportunities for organizational expansion into Texas
- Determined viability of offering new services/products compared to outsourcing and contracting agencies through a financial and operational inquiry

Skills and Relevant Coursework

MATLAB | Python | Arduino IDE | C | VS Code | Solidworks | CAD | Excel | Salesforce | MS Office Suite
Data Science | Thermodynamics | Signals | Statistics | Biomedical Design | Organic Chemistry | Physiology

Jordan Anthony Ahn

jordahn@bu.edu • (973) 856-3881 • www.linkedin.com/in/jordan-ahn Little Falls, NJ, 07424

EDUCATION

Boston University, Boston, MA **May 2023**

Bachelor of Science in Biomedical Engineering; Overall GPA: 3.97

Dean's List (All 7 semesters)

Relevant Coursework – Intro to Data Science in R; Systems Physiology; Survey in Biostatistical Methods; Principles of Molecular Cell Biology; Cognitive Psychology; Intro to Experimental Design; Probability, Statistics, and Data Science for Engineers; Differential Equations; Multivariate Calculus; Computational Linear Algebra; Programming for Engineers (MATLAB, C); Calculus I/II

RELEVANT EXPERIENCE

Summer Institute in Biostatistics: Summer 2022; School of Public Health, Boston University; Boston, MA.

GWAS of the T2D-GENES Data Set

- Generated descriptive statistics and performed preliminary statistical tests for discovery of covariates.
- Created linear regression models for genetic data using PLINK on the Shared Computing Cluster (SCC).
- Produced Q-Q and Manhattan plots to visualize results of genetic data analysis.
- Presented results to peers and other PIs through both a presentation and written report.

Biostatistics Intern: Summer 2021; Division of Biostatistics, Albert Einstein College of Medicine; Bronx, NY.

COVID Vaccine Efficacy in Patients with Systemic Lupus Erythematosus (SLE)

- Analyzed observational data to determine predictors of COVID vaccine efficacy in patients with SLE.
- Conducted bivariate analyses using T-tests and chi-square tests.
- Generated logistic regression models to identify independent predictors of high versus low antibody response to vaccine and adjust for potential confounders.

Comparison of Post-Surgical Pain Outcomes of Opioid vs Non-Opioid Analgesia

- Processed and interpreted data from a non-inferiority trial of Percocet (opioid) versus Ketorolac (NSAID; non-opioid) for treating post-surgery pain in patients with urinary stone disease.
- Conducted tests of non-inferiority of primary pain outcomes and evaluated various secondary outcomes.
- Created table of results for inclusion in a manuscript called "Optimizing pain management following kidney stone surgery: can we avoid narcotics?" published in the World Journal of Urology.

RELEVANT SKILLS

Statistics – Exploratory analysis, bivariate analysis, regression modeling, non-inferiority testing, GWAS analysis
Coding Languages – R, MATLAB, C, SAS, PLINK

EXTRACURRICULARS

Society of Asian Scientists and Engineers Executive Board

- Charity Chair (2020-2021)
- Fundraising Chair (2021-2022)
- Senior Advisor (2022-present)

Boston University Kendo Association (2022-present)

Vinaya Akavoor

vinayaa@bu.edu • (347) 406-1807 • www.linkedin.com/in/vinaya-akavoor • Boston, MA

Education

Boston University College of Engineering — Boston, MA
Bachelor of Science in Biomedical Engineering — May 2023
GPA: 3.65/4.0

Skills

Programming: MATLAB, CAD, Python, Deep Learning, Image processing
Applications: Microsoft Office Suite, Google Suite, Arduino
Laboratory: Molecular Cloning, Gel Electrophoresis, Microscopy, Cell Culture and Digestion

Professional Experience

Automation Engineer Intern — Jun 2022 – Present
Foundation Medicine

- Characterized and tested lab equipment to determine validity of use in lab settings
- Formulated and conducted quality assurance experiment protocols
- Debugged errors for liquid handling robot methods

Sustainability Innovation Intern — Jun 2020 – Jan 2021
Born Global Foundation

- Conducted research within team on medicinal plants and Levantine practice to prototype a mobile gaming application for educational purposes in the Levantine region
- Led client consultations and design meetings to pitch gaming application

Research Experience

Research Assistant
BU Computational Neuroscience & Vision Lab — Sep 2021 – Jun 2022

- Developed deep neural network to classify images of different types of blood cells with accuracy rates up to 76%
- Extensively pre-processed and analyzed 8000 blood cell images to increase networks efficiency and accuracy
- Coded parameters to improve performance of neural network

Projects

Umbilical Cord Clamp — Jun 2021 – Aug 2021

- Designed umbilical cord clamp collaboratively with team using Solidworks for hospitals in developing countries
- Researched cost-effective, easily sterilizable, environmentally friendly, and accessible materials for 3D printing manufacturers in Somalia

Pulse Oximeter — Sep 2020 – Dec 2020

- Built device to display user's heart rate and blood oxygen percentage using Infrared Light, sensor, and Arduino code and processor to convert sensed data into processable output signal
- Utilized CAD (OnShape) to design housing of product to make device durable, easy to clean, and usable for hospitals and at-home users during the Covid-19 pandemic

Leadership & Activities

President, Hindu Students Council at BU — Sep 2021 – Present
Inspiration Ambassador, Technology Innovation Scholars Program at BU — Sep 2020 – May 2022

Ahmed Al Saif

161 Washington ST APT 1506 MA 02135♦ ahmed.saif@kaust.edu.sa ♦ (267) 901-4646 ♦

EDUCATION

Bachelor of Science in Biomedical Engineering **May 2023**
Boston University

- GPA: 3.32
- Relevant Coursework: *Calculus I & II & III, MA 226, Chemistry I & II, EK125, EK301, BE209, BI315, BE420, BE491, BE492, QST SI250, EK 424, BE465, BE468*

Certifications:

- **Creativity & Entrepreneurship,** *Berklee College of Music* **August 2020**
- A four-week online course on how creative people carve their own paths to success
- **Introduction to Negotiation: A Strategic Playbook for Becoming a Principled and Persuasive Negotiator,** *Yale university* **July 2020**
- An eight-week online course about negotiation strategies on how to maximize profit
- **Foundation Year Program,** *University of Pennsylvania***,** *Philadelphia, Pennsylvania* **May 2019**
- College preparatory program with focus on standardized test prep, university applications, and non-credit college-level STEM-related coursework
- **The Summer Institute for the Gifted summer program,** *Yale University***,** *New Haven, CT* **July 2017**
- In person courses offers opportunities to explore a variety of subjects and interests that were not attainable before
- **Summer Discovery University of** *Texas at Austin, Austin TX* **June 2016**
- Pre-college program teaches students how to adjust to living on their own and offered introductory college courses

RESEARCH EXPERIENCE

King Abdullah University of Science and Technology (KAUST), Saudi Arabia **June – August 2022**
Intern – Stefan Arold's Lab

- Designed antibodies/scFv antibodies for biosensing under the supervision of Raik Gruenberg
- Conducted DNA transfection and transformation assays in both bacterial and mammalian cells
- Analyzed expression of a protein in cells using Western blot
- Presented poster in a STEM focused symposium to KAUST research community

University of Washington, Seattle, Washington **July – August 2021**
Research Assistant – Hannele Ruohola-Baker's Lab

- Tested HEK cell viability under varying conditions under the supervision of Ashish Phal
- Determined expression of cleaved parp using Western blots and alamarBlue
- Presented project to a panel of researchers and undergraduate students in a multidisciplinary symposium

HONORS & AWARDS

Recipient – *KAUST Gifted Student Program (KGSP) Scholarship* **August 2018 – Present**

- KGSP is a STEM-centric scholarship offered to a select group of Saudi students and provides the necessary resources to pursue STEM undergraduate programs at top American universities

VOLUNTEER EXPERIENCE

- **Volunteer** Engineering tour guide *(Boston University)* **September 2021 – Present**
- Led weekly engineering specific tours around campus to prospective students
- **Volunteer** Days of Service *(Boston University)* **September 2021 – Present**
- Managed bi-monthly events in the city of Boston
- **Volunteer** Student Ambassador *(UPENN)* **September 2018 – Present**
- Mentored new ESL students in a youth development program for a month
- **Volunteer** Student Advisor *(Boston University* **September – December 2022**
- Teach bi-weekly class to incoming students and help them adjust to college life

SKILLS

Computer: Microsoft Office, MATLAB, C
Language: Fluent in Arabic, Advanced English

Saud Alfakhri

217-979-1807 saudalf@bu.edu Boston, MA 02134, USA

EDUCATION

Boston University - Bachelor of Science in Biomedical Engineering **May 2023**

RESEARCH EXPERIENCE

University of California Irvine, Irvine, California **July 2022 – August 2022**

Research Assistant – Department of Biomedical Engineering - Assistant Professor Christine King

- Created a sensor circuit to test new vaginal speculum design in Dr. Christine King's lab
- Developed an interactive graphical user interface using Arduino and Matlab
- Programmed an algorithm to calibrate sensors and graph data in real time

University of Washington VISIT Program, Seattle, Washington **July 2021 – August 2021**

- Researched stem cells and regenerative medicine lab at University of Washington
- Investigated human embryotic cells using bioinformatics, western blots, and Alamar Blue imaging

ENGINEERING PROJECTS

Boston University, Boston, Massachusetts **September 2022 – May 2023**

Senior Design – Department of Biomedical Engineering

- Lead a team to study effects of 40 Hz gamma frequency on cognitive performance in the hope to help young adults that suffer from attention deficiency disorders

Boston University, Boston, Massachusetts **January 2022 – May 2023**

BE428 Team Project – *Department of Biomedical Engineering*

- Created a pulse oximeter with group work calibrated for people of color by programming a new algorithm, constructing sensor circuits, and 3D printing an acrylic casing

Boston University, Boston, Massachusetts **December 2019 – September 2018**

MATLAB Final Project – Department of Computer Engineering

- Analyzed Boston's crime data to understand crime patterns and visualize data based on crime threat level, time, and location as an attempt to create a guideline to provide a safer community

SKILLS:

Molecular Biology & Chemistry Skills

Assays: Purification & detection of DNA and Almar blue starvation assay

Biotechnology & Characterization: PCR, Inserting plasmid into sample, Western and Southern blots

Engineering & Computer Skills

Design: Photo and video editing

Programming Languages Engineering: Arduino, MATLAB, Python, R, limited C

Programs: Microsoft Office

HONORS & AWARDS

KAUST Gifted Student Program (KGSP) Scholarship

August 2018 – Present

- King Abdullah University of Science & Technology (KAUST) awards selected students with prestigious scholarship allowing students to pursue undergraduate degrees and return to KAUST to complete graduate studies

Mawhiba Gifted Student Fellowship

June 2012 – May 2018

- Chosen based on cognitive tests to be among top 1% students in Saudi Arabia, studied advanced curriculums, participated in academic and research programs, and received a full paid scholarship to selected schools

VOLUNTEER EXPERIENCE

Nuqsh Volunteer **2019 – 2021**

Natalia Alonzo

nialonzo@bu.edu • (585) 727-1330 • https://www.linkedin.com/in/natalia-alonzo-a8a07322b/

Education

B.S. in Biomedical Engineering, Boston University College of Engineering — May 2023

- Minor in Innovation & Entrepreneurship

Experience

Summer Engineering Fellowship Program – ***Washington University at St. Louis*** — June – July 2022

- Conducted an independent project in the Chen Ultrasound Lab led by Professor Hong Chen
- Performed standard intranasal drug delivery and perfusion techniques on anesthetized mice
- Presented project at a symposium to program mentors, graduate students, and participants

Research Assistant Intern – ***Corning Incorporated*** — July – August 2019

- Conducted weekly experiments involving HEK and CHO cells in Life Sciences R&D
- Utilized sterile techniques for pipetting and managing live cells
- Presented project goals and results of lab experiments to program mentors and participants

Research Assistant Intern – ***Corning Incorporated*** — July – August 2018

- Performed trials of various coating and firing procedures for cordierite in Crystalline Materials Research
- Compared cordierite samples with scanning electron and metallurgical microscopes
- Presented project goals and results of lab experiments to program mentors and participants

Projects

Investigating Biophysical Effects of Ultrasound Neuromodulation – ***Boston University*** — September 2022 – May 2023

- Senior design project in the Han Lab under Professor Xue Han

Intranasal Drug Delivery Pathways in Mice – ***Washington University at St. Louis*** — June – July 2022

- Developed a novel protocol for extracting intact brain and nasal tissue from mice after drug delivery

Participant of WPI's Virtual Internship in Biomedical Engineering Program — June – July 2021

Honors & Awards

- Winner of Tissue Engineering category for BMES Design-a-thon, Boston University — July 2021
- National Merit Scholarship Winner – sponsored by Corning Incorporated — 2019 – present
- Campus Hunger Challenge Finalist (BUild Lab)

Skills

- Instrument Knowledge: SEM, ViCell XR, Nova Flex II, Spectrometer, PicoScope
- Lab: Pipetting, Sterilization SOPs, Cell Culture Maintenance, DNA Electrophoresis, Plasmid Vectors, Electrocardiogram/Electromyogram Analysis, Image Processing, Tissue Perfusion, Mice Anesthesia, Intranasal Drug Delivery
- Software: Intermediate in Microsoft Office, MATLAB, LabScribe 4; Beginner in C++, Arduino

Layth Amra

lnamra@bu.edu • (713) 818-1172 • www.linkedin.com/in/laythamra Boston, MA

EDUCATION

BOSTON UNIVERSITY | Boston, MA — Expected May 2023
Bachelor of Engineering, Biomedical Engineering;
Minor in Computer Science; concentration in machine learning

- GPA: 3.88

EXPERIENCE

Research Assistant for Neurovascular Imaging Lab | Boston University — September 2020 – present

- Collaborate with a team of 4 to create a web app in MATLAB for easy sharing, visualization and analysis on data of two-photon imaging in the somatosensory cortex of awake mice.
- Presented an abstract on database in the annual Optical Society of America conference and hosted a panel to answer questions; writing and publishing a paper to the Neurophotonics journal come May.
- Contributed as co-author on paper published in PLOS Biology titled "Baseline oxygen consumption decreases with cortical depth".

Summer Institute of Biomedical Informatics | Harvard Medical School — June 2022 – August 2022

- Developed a Python pipeline performing mycobacterial genome wide association studies to investigate associations between the genome of tuberculosis and location of infection.
- Identified 2 statistically significant genes in genome of tuberculosis associated with extra-pulmonary phenotype.
- Presented findings to board director of biomedical informatics as well as other professionals in the department of biomedical informatics.

PROJECTS

EEG Headset | Boston University — September 2022 – present

- Proposed development of a novel device to detect concussions in athletes using brain waves and cerebral blood flow for senior design project.
- Working on the EEG team responsible for extracting clinically relevant quantitative EEG features shown to be predictive of concussions.

Breast Cancer Classification | Independent — November 2022 – December 2022

- Utilized Python's PyTorch framework to create and train 3 different convolutional neural networks adapted from popular architectures such as Alex Net to classify breast cancer from MRI images.
- Performed Bayesian hyper parameter tuning on each network to tune the learning rate, batch size, and optimizer.

Pulse Oximeter | Boston University — August 2020 – November 2020

- Designed and coded a functional pulse oximeter using an Arduino Uno and 2 LEDS that measures blood oxygen saturation with an error rate of ± 1.5%.
- Implemented CAD to design 3D printed housing and housed the Arduino Uno along with the LEDS.

SKILLS

Python, Java, C, PyTorch, Tensor flow, Scikit-learn, Numpy, Pandas, Microsoft Excel, Adobe Photoshop, Arabic, GitHub

Ameen A. Andijani

Ameen.andijani@gmail.com • (617) 460-6232 • www.linkedin.com/in/ameen-andijani Boston, MA

EDUCATION

Bachelor of Science in Biomedical Engineering **Expected May 2023**
Boston University (BU)
- Relevant Coursework: *Engineering Mech, Biomedical Signals & Controls, BME Device Diagnostics & Design*

Certificate of Completion – Foundation Year Program **May 2019**
University of Illinois at Urbana-Champaign (UIUC), Champaign, Illinois
- Customized college preparatory program, designed to bridge gaps between high school and college, focusing on ESL coursework, test prep, and college-level classes

Harvard Secondary School Program (HSSP), Cambridge, MA **August 2017**
Harvard University

EXPERIENCE

Development of Hydrolytically Degradable Cell-Releasing Hydrogel Carrier for Bone Marrow Transplantation in High-Risk Polycythemia Vera Patients, University of Texas at Austin, Austin, TX **July 2022 – August 2022**
Undergraduate Research Assistant
- Completed a 5-week program of research and lab experience in the Cosgriff-Hernandez Laboratory at UT Austin
- Conducted experiments on polymers for synthetic hydrogel formation under Dr. Mykel Green's supervision
- Performed accurate chemical measurements and monitored chemical reactions
- Developed and presented a poster

Global Entrepreneurship and Innovation Program, Arizona State University (Online) **July 2021 – August 2021**
Attendance and Completion
- Customized program to introduce entrepreneurship and business methods
- Introduced and worked on a new idea called AeroCase, a phone case focused on heat retention and isolation
- Incorporated contemporary material such as Aerogel used as heat insulation material and added rigidity

Center for Talented Youth (CTY) – Johns Hopkins University, Baltimore, MD **July 2016 – August 2016**
Neuroscience student
- Completed a 3-week intensive summer program on Neuroscience
- Gained lab experience in managing and identifying parts of the brain in animals
- Presented research on *Why We Dream?*

OTHERS

MAWHIBA Gifted Student Program **August 2013**
- MAWHIBA Gifted Student Program is a sponsorship awarded to top-ranking young Saudi students

Recipient – *KAUST Gifted Student Program (KGSP) Scholarship* **August 2018**
- KGSP is a prestigious scholarship awarded by the King Abdullah University of Science & Technology (KAUST)

CO-CURRICULARS

Poster Presenter, *KAUST Gifted Student Program KGSP Convocation 2023, Atlanta, Georgia* **January 2023**
- Presented on UT Austin research at the KGSP Enrichment Fair during the annual KGSP convocation

Co-Founder, *DAZ AlFaisalyah Recycling Group, Jeddah, KSA* **March 2017**
- Served as club leader, dedicated to recycling electronic waste in Jeddah

Volunteer, *Izlal Volunteer Group, Jeddah, KSA* **August 2012**
- Planted green plants to save Jeddah's dying ecosystem

SKILLS

Computer: Microsoft Office, MAT Lab, C
Language: Fluent in Arabic, Fluent in English
Leadership: Experienced leader and organizer
Teamwork: Experienced in team-environment

Elizabeth Avery

Alameda, CA 94501 | (510) 384-0545 | averye@bu.edu | www.linkedin.com/in/elizabeth-lizzy-avery

EDUCATION

BOSTON UNIVERSITY COLLEGE OF ENGINEERING | Boston MA — Expected July 2023
Bachelor of Science in Biomedical Engineering

PROJECTS

Truss Project – Engineering Mechanics 1
- Built and analyzed process of creating truss that would be able to hold 1.5kg.
- Used material analysis and preliminary design; evaluated using MATLAB to design and build.
- Collaborate with team of four to create and code truss design.

Pulse Oximeter – Engineering Design
- Built a working prototype of a Pulse Oximeter using an Arduino kit and document work, including drawings, schematics and specifications into an engineering report.
- Generated physical and mathematical modeling to verify conceptual design is viable.
- Used engineering design process to identify problems, objectives, constraints, and consider a range of solutions in order to create the best product.

Connect 4 Game with AI Player – Computer Science
- Developed a class for the board for a game of Connect Four.
- Defined a more "intelligent" computer player (uses techniques from artificial intelligence (AI) to choose its next move).

Eight Puzzle – Computer Science
- Apply state-space search to solve (including an implementation of several classic state-space algorithms) any valid initial configuration of the Eight Puzzle.
- Develop variations on the required algorithms which will reduce the time needed to find a solution.

EXPERIENCE

Varsity Softball | Boston University — August 2019 – Present
- Committed approximately 30 hours per week to training, meetings, film study, travel, and competitions while maintaining full course load.
- Developed concentration, strong work ethic, and perseverance to meet personal and team goals.
- Organized formal and informal meetings to facilitate and improve communication among team members.
- Coordinated team volunteer activities for local community.
- Patriot League Academic Honor Roll in 2020.

Boys and Girls Club | Alameda, CA — June 2018 – March 2019
Volunteer
- Supervised children at the club and on field trips, arranged activities such as sports and arts and crafts.
- Managed specified homework time, tutoring children and helping them complete homework.
- Cared for children and coached positive social behavior, engage in playtime, and orchestrate snack time.

ACTIVITIES

Student Athletes of Color Member | Boston University — August 2019 – Present
- Foster an environment that ensures the opinions of all students are valued, respected and empowered.
- Inspire change throughout the BU Athletics community and beyond.
- Educate ourselves and the BU Athletics communities of the injustices in our society and formulate steps to resolve them.

Athlete Ally Member | Boston University — August 2019 – Present
- Create the space and bring people together to allow all LGBTQIA+ athletes and allies to thrive.
- Teach others why equality matters and how it can help their teams.
- Give all athletes and allies the conviction to be authentic in themselves as athletes and people.

SKILLS

Python | Java | MATLAB | C | C++ | Microsoft Office Suite

Alexander Barutis

abarutis@bu.edu • 201-759-3633 • linkedin.com/in/alex-barutis • Boston, Massachusetts

EDUCATION

Boston University, Boston, MA — May 2023
Bachelor's of Science in Biomedical/Bioengineering

PROFESSIONAL EXPERIENCE

Chen Lab - Tissue Microfabrication Laboratory — January 2023 – Present
Undergraduate Researcher:

- Performing cloning-based projects yielding constructs to be expressed in CHO-K1 cell lineages, endothelial and other cell types.
- Designed a controlled adhesion system to study VE-Cadherin and N-Cadherin using a TET inducible Split Fluorescent Protein system.
- Engineered a cleavage sensing system for NOTCH 1 and NOTCH 2 proteins utilizing a Split Fluorescent Protein system.
- Expressed cleavage system in generated micro-vasculature systems to verify expression of and sensing of NOTCH gene.

International Genetically Engineered Machine - iGEM — June 2022 – Nov 2022
Biomedical/Bioengineer/Front End Developer:

- Pioneered a Synthetic Biological system utilizing droplet-based microfluidics as well as novel biosensors in order to detect toxins and pollutants within an aquatic environment.
- Manufactured and assembled personalized droplet-based microfluidic devices in order to encapsulate a given biosensor and liquid sample. Droplets were then sent through a series of mixers to ensure a complete reaction.
- Developed a digital portfolio for complete documentation of the project creating functional navigation pipelines, logos, and illustrations/graphics to communicate all important information and processes.
- Mentored and led an interdisciplinary team of 5 engineers and enabled communication between different fields through created non-technical descriptions.

DAMP Laboratory/Wilson Wong Laboratory — September 2021 – September 2022
Undergraduate Researcher:

- Designed and implemented a DNA assembly pipeline investigating several cloning techniques to examine and determine efficiency.
- Performed Golden Gate Assembly and Type II Restriction Enzyme cloning in through forms of Modular Cloning as well as Gibson Assembly.
- Generated Python protocols to automate plating of custom engineered bacteria strains using the OT2 liquid handler.

HONORS & AWARDS

Computing Research Association — November 2022
CRA Outstanding Undergraduate Researcher Award Nominee

- Recognizes undergraduate students in North American colleges and universities who show outstanding potential in leading research in an area of computing.

International Genetically Engineered Machine - iGEM — October 2022

- Gold medal for outstanding completion of competition requirements.
- Nominated for best environmental project.

SKILLS

Microfluidic Chip Design, Microfluidic Chip Fabrication, Microscopy, ImageJ, PCR Primer Design, PCR, q-PCR, rt-PCR, Western Blotting, Gel Electrophoresis, Gel Extraction, Bacterial Transformation, MiniPrep, Molecular Cloning, 2D Cell Culture, Python, PyTorch, Machine Learning, Tensorflow, MATLAB, HTML, CSS, JS, C, C++, Front End Development, Adobe Suite, Microsoft Office Suite, Solidworks, COMSOL MultiDim Physics Modeling

Kerena Belony

kbelony@bu.edu • 470-429-0786 • www.linkedin.com/in/kerena-belony

EDUCATION

Boston University College of Engineering | Boston, MA — Expected May 2023
Bachelor of Science in Biomedical Engineering, Pre-Med Track
Coursework: Biochemistry Signals & Control Systems Systems Physiology Intro to Machine Learning

PROJECTS

Senior Project: Predictive Models of Alzheimer's Disease Diagnosis Project, Niji Corp
- Analyze data from publicly available neuroimaging database
- Develop predictive machine-learning models of Alzheimer's disease risk from brain imaging data
- Investigate literature on biomarker detection for classifying neurodegenerative disease
- Delegate tasks amongst five team members

Quant Studio 5 Real Time PCR System Project, Boston University
- Conducted PCR experiment using SYBR Green chemistry and primers for isothermal assays
- Researched use-cases of device and contributed to comprehensive research paper on real-time PCR process and device usage
- Edited and stitched how-to video on qPCR device procedures
- Presented project in team of five students

"OsteoPatch" Project, Worcester Polytechnic Institute
- Evaluated impact of infrared light on bone fracture healing utilizing literature
- Coded timer with C++ for indicator light of orthopedic wearable circuit model on Arduino Uno
- Generated model of orthopedic wearable with infrared light design named "OsteoPatch"
- Designed circuit model of electrical functions of orthopedic wearable using computer-aided design software; executed design with Arduino Uno
- Produced video of design on YouTube with three group members

Pulse Oximeter Project, Boston University
- Wired circuit using Arduino to measure blood oxygen concentration levels and heart rate
- Soldered wires for pulse oximeter prototype
- Collaborated with three students to research and conceptualize design

LEADERSHIP EXPERIENCE

Resident Assistant - Boston University — Jan 2022 - present
- Develop strong relationship with 30+ residents through counseling students on various issues
- Plan and implement programs to create inclusive community among students

Physics Learning Assistant - Boston University — Jan 2021 - Oct 2021
- Taught weekly discussion sections to help students with practice problems
- Conducted weekly office hours to assist students with course material and prepare for exams

SKILLS

Lab: Pipetting, qPCR
Computer: MATLAB, C++, Python, CAD, Arduino, Microsoft Office, Video Editing
Language: Haitian Creole, Intermediate in Spanish

LEADERSHIP & ACTIVITIES

Member, Minority Association of Pre-Medical/Pre-Health Students — Sep 2022 - present
Member, National Society of Black Engineers — Sep 2020 - present
Secretary, Inner Strength Gospel Choir — Sep 2021 - Jan 2022

Aida Isabel Berberian Morales

aidab@bu.edu • (857) 919-7639 • https://www.linkedin.com/in/aidaberberian/ • Boston, MA

EDUCATION

Boston University. B.Sc. in Biomedical Engineering with concentration in Technology Innovation *Expected May 2023*

WORK EXPERIENCE

BU MechE Department | Boston, MA *Aug 2022 – Present*
Web Content Migration Specialist

- Used WordPress to migrate content from current bu.edu/eng site to new platform.
- Ran the MechE section and worked with colleagues in other departments to achieve a cohesive look and updated website.

Operation Smile | Panama, Panama
Web Builder *Jun – Sep 2022*

- Developed and revitalized website using WordPress while aiding in creation of a new brand identity booklet.

Hospital Pacífica Salud Emergency Department| Panama, Panama
Student Medical Intern *May – Jul 2019*

- Shadowed doctors while performing tasks such as taking patient's vitals, placing EKG electrodes, and monitoring patient status.
- Resident English to Spanish medical translator.

ProMed | Panama, Panama
Sales Department Intern *Feb – May 2019*

- Carried out inventory and quality control at various hospitals and observed surgeries for product review.
- Interviewed potential doctoral candidates for partnership with the company and product implementation.

Operation Smile | Panama, Panama
Executive Assistant *Jan – Feb 2019*

- Spearheaded planning and organization committee for annual LEA convention in Paraguay and pitched project to board of directors for approval.

PROJECTS

Sign Now | TAMID at BU
Project Manager and Consulting Analyst *Aug 2021 – May 2022*

- Researched market penetration in Asia for international startup for deaf accessibility.
- Opened a constant channel of communication with CEO and board of directors for weekly deliverables.

Liter of Light Panama | Panama, Panama
Board Treasurer and Founder *Jun 2016 – Jan 2020*

- Founded Liter of Light chapter in Panama, a non-profit organization providing communities with knowledge of repurposing recycled plastic to illuminate homes and streets.

SKILLS

Languages: Fluent in English and Spanish, Beginner French, Beginner Portuguese
Software/Design/Tools: MATLAB, Adobe XD, Microsoft Office Suite, Fusion360, WordPress
Courses and Certifications: EF SET English Certificate C2 Proficient

ACTIVITIES

LATAM BU *Sep 2022 – Present*
TAMID at BU *Feb 2021 – Present*
BioBiz BU *Sep 2020 – Present*
Society of Women Engineers *Feb 2020 – Present*
Operation Smile Panama Volunteer *Mar 2015 – Present*

Gabriela I. Berniac

gberniac@bu.edu • 781-850-6482 • https://www.linkedin.com/in/gabriela-berniac-396803192/ • Stoneham, MA 02180

EDUCATION

Boston University, College of Engineering — **Boston, MA**
Bachelor of Science in Biomedical Engineering — Expected May 2023
Current GPA: 3.65/4.0

EXPERIENCE

Research

Professor Timothy O'Shea's Lab, Boston University — **Boston, MA**
Undergraduate Research Assistant — Feb 2021 - May 2023

- Cultivated, sub-cultured, and conditioned mouse neural progenitor cells (NPCs)
- Counted and collected cells for further analysis
- Conducted RNA extraction and RT-qPCR analysis
- Performed immunocytochemistry (ICC) and immunohistochemistry (IHC) staining
- Imaged cell and tissue samples on slide scanner
- Analyzed data through image analysis using ImageJ program

Industry

Genoskin, Inc. — **Salem, MA**
Summer Intern with following responsibilities: — Jul - Aug 2020

- Developed predictive ex vivo human skin models as alternatives to animal testing in Life Sciences R&D
- Managed lab operations by ordering and receiving supplies, managing inventory, maintaining equipment, and sanitizing the lab
- Received basic training on operating a microtome and biological safety cabinet
- Translated protocol documents from French to English for final review

PROJECTS

Undergraduate Research Opportunities Program (UROP) and Distinguished Summer Research Fellowship (DSRF) at Boston University — **Boston, MA**
Under mentorship of Dr. Timothy O'Shea — Jun 2021 - May 2023

- Conditioned neural progenitor cells (NPCs) by exposing them to injury-like environments prior to transplantation to improve their function within CNS
- Identified conditioned NPCs as a promising candidate population for transplantation in CNS injury lesion cores
- Designed an *in-vitro* experiment to simulate a CNS injury environment, and evaluated its impact on both unconditioned and conditioned samples
- Concluded the conditioned samples demonstrated improved resistance to reprogramming when compared to unexposed NPCs
- Contributed as an author to a pending publication
- Presented research results at the Biomedical Engineering Society 2022 Annual Meeting
- Presented research results at the Annual Boston University Undergraduate Research Symposium in October of 2021 and 2022

SKILLS

Cell Culture Techniques: Sub-culturing, counting, fluorescent imaging, immunocytochemistry (ICC), immunofluorescence (IF), immunohistochemistry, cell differentiation
Molecular Biology Techniques: RT-qPCR, RNA Extraction
Histology: Immunohistochemistry (IHC)
Computer: MATLAB, C+, ImageJ program
Devices: Olympus VS120 Automated Slide Scanner, OlyVIA software
Languages: English (fluent: native), French (fluent: reading, writing), Spanish (fluent: speaking, reading)

GUS BETTS-O'ROURKE

gbetts@bu.edu • (617) 965-1799 • Boston, MA

Education

Boston University, Colleges of Engineering and Arts & Sciences Expected May 2023
B.S. in Biomedical Engineering and B.A. in Chemistry: Biochemistry
Relevant Coursework:
Biochemistry: Organic Chemistry, Cell Biology, Quantum Mechanics, Statistical Thermodynamics, Biochemistry, Inorganic Chemistry, Physical Chemistry Laboratory, Instrumental Analysis, Materials Chemistry.

Biomedical Eng.: Probability & Data Science, Biomedical Signals & Controls, Biomedical Measurements, Thermodynamics, Transport Phenomena, Software Engineering (C, C++), Clinical Applications of Biomedical Design, Biomaterials, Polymers & Soft Materials.

Skills

Computer: MATLAB, C, C++, Microsoft Word, Excel, PyMol, NMR analysis, IGV
Laboratory: FESEM, Liquid & Gas Chromatography, Spectroscopy (UV/Vis, IR, Fluorescence, Raman, NMR, AE, AA), Quantitative Solution Work, Technical Writing Proficiency, Scientific Exhibit Preparation, PCR, Gel Electrophoresis
General: Presentations, Conversational Spanish

Experiences & Projects

DePuy Synthes Sep 2021 - Present
- Spearheaded a team of five to manufacture and evaluate a novel surface for medical implants.
- Characterized produced surfaces with chemical methodologies and FESEM.

Produced novel method for in vivo drug tracking Spring 2022
- Led a team of 4 to propose a novel method for in vivo tracking of multi-walled carbon nanotubes.
- Synthesized previous research to address lack of in-vivo tracking of self-propelled nanomachines for cancer drug delivery.
- Submitted method in form of a grant proposal and an oral presentation.

Designed and built a lamp post mounted flood detector for use in the community Fall 2021
- Led & managed a team of 4 to design from scratch a solar powered flood detector for use in Boston.
- Coded in C++ software for detecting flooding and remote notification to city of flood conditions.
- Implemented a strategy to stay within a budget and maintain a schedule for research and prototype development over a semester including regular check-ups to ensure a robust project timeline.

Designed and carried out an experiment to produce three benzodiazepines Spring 2021
- Collaborated as a team of 3 to combine existing research to synthesize 9 benzodiazepines and characterize products. Predicted and investigated reaction mechanism via isolation of intermediates.
- Collected preliminary safety data drugs using brine shrimp.
- Analyzed physical and chemical properties using quantitative measurement techniques (GC/MS, NMR, IR).

Work Experience

Genteract – Research Assistant July - September 2022
- Employed a modified GSEA computation method to identify new relationships between SNPs and phenotype-environment pairs in foods and pharmaceuticals.

Ruhaan Bhagat

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Boston, MA

EDUCATION

Boston University – College of Engineering, Boston, MA — Expected May 2023
Bachelor of Science: Biomedical Engineering, GPA: 3.54/4.00
- College of Engineering, Dean's List.

University of California, Davis – College of Engineering, Davis, CA (GPA: 3.58/4.00) — 2019 – 2020

RELEVANT EXPERIENCE

Belmont Medical Technologies, Greater Boston, MA — Jul 2022 – Sep 2022
R&D Intern
- Reported a 61% more effective adhesive-plastic combination through force gauge data collection and break testing analysis
- Redesigned and built an improved testing setup to better appraise prototype's performance based on client specifications
- Designed and constructed test setup integrated with an environmental chamber to assess reliability of prototypes
- Conducted testing and collected data to quantitatively analyze performance and present recommendations to create improved performance and efficiency of prototype
- Created a device to hold epoxy syringes and clear out excess leaks to streamline the assembly process of prototypes

Abbott Laboratories, Mumbai, India — Jun 2021 – Aug 2021
Strategy & Operations Intern
- Collaborated with a team of four to develop a 36% more efficient method of design and production of diagnostic devices and a 42% for vascular devices in Indian markets through Solidworks
- Administered a customized, user-friendly employee interface to aid Abbott India's pharmaceutical Strategy & Operations team

Greymatter Entertainment (International Emmy nominated company)**,** Mumbai, India — Jul 2021 – Aug 2021
Project Lead - Local adaptation team
- Remodeled a Korean drama based on client specifications to be better adapted for Indian television while leading a team of 5
- Analyzed viewership trends to optimize plotlines and character evolution graphs to better engage local youth audience

Pedal-o-thon, Mumbai, India — May 2017 – Jan 2018
Co-head
- Managed four teams; Logistics, Accounts and Sponsorship, Communications and Tech, and Publicity to launch a cycling event
- Raised $11,000 to aid Fellowship of the Physically Handicapped through sponsorships and profits of a 120 person cycling event
- Advocated and raised awareness for the differently abled by advertising cycling event in a national newspaper and radio station

PROJECTS

Senior Design Capstone Project, Boston University — Oct 2022 – Present
- Working with Boston Medical Center to develop a novel laryngoscope using negative pressure zones to reduce pathogen load

Final Design Project, Boston University — Sep 2022 – Dec 2022
- Designed and created a wearable diagnostic strap with sensors for symptom tracking and live warning system for POTS patients
- Gained CAD and coding experience through modelling of product and integration of three different sensors with Arduino sense

Final Shark Tank Pitch, Boston University
- Awarded highest funding ($1.85MM) in engineering innovation pitch competition by identifying gaps in the medical industry

Capstone Project, Boston University — Mar 2022 – May 2022
- Invented a wearable diagnostic device utilizing narrow band imaging to identify potential carcinomas in large tissue samples
- Performed a cost-benefit analysis to make production 30% more cost-effective by manufacturing parts through 3D-printing

Final Coding Project, UC Davis — Sep 2020 – Dec 2020
- Achieved a functional LAN-based multiplayer Blackjack game using MATLAB with live graphics and single-player mode

Design Challenge, UC Davis. — Nov 2019
- Designed and manufactured a 25 x 30mm assistive device to aid hemiplegic children with tying shoelaces using CAD models

SKILLS

Technical Skills*:* Onshape/SolidWorks, 3D-Printing, MATLAB, Python, C++, MS Office (Word, Excel, PowerPoint)
Volunteering: Relay for life; cancer awareness (2017-2019), Angel express; educating underprivileged children
Interests: Squash (trainer for Boston University), Intramural soccer, Investing, Fitness

VARUN SINGH BHALLA

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Education

Boston University Boston, MA

Bachelor of Science in Biomedical Engineering Expected 05/23

Work and Leadership Experience

Research Assistant (Gong Laboratory at Boston Medical Center) (05/22 - Present)

- Engineered a 3D imaging project based on reversing Glaucoma by making the Schlemm's canal more porous.
- Analyzed, located, and identified giant vacuoles in the Schlemm's Canal using Reconstruct software and collecting the data in Excel sheets.
- Calculated, tabulated, and compared the volumes of the Giant Vacuoles to those calculated in previous studies to check if higher pressure and more volume to a change in the number and type of Giant Vacuole.
- Received funding to conduct my project under the Undergraduate Research Opportunities Program at Boston University.

Technology Innovation Scholars Program Inspiration Ambassador (Boston University) (09/21 - Present)

- Educated middle school and high school students in robotics and other engineering-based activities.
- Inspired them to pursue engineering in university.

College of Engineering Manager (Boston University) (05/22 - 08/22)

- Conducted tours of the College of Engineering to prospective students.
- Administered the logistical work at the Undergraduate Programs Office at the College of Engineering.

Research Assistant (The Scott Cognition Lab at Boston University) (07/21 - 05/22)

- Performed projects based on Transitive Interference and Neuroplasticity.
- Computed data using MATLAB, trained the experimental rats, and tracked neurons in songbird brains using the FIJI software.
- Engineered the lab apparatus used to house and train the experimental rats.
- Wrote MATLAB code which improved the efficiency of the data analysis.

Sophomore Engineering Mentor (Boston University) (05/21 - Present)

- Guided rising sophomores at the College of Engineering tackle the new problems that come with reaching a higher level.
- Counseled the sophomore students on their academic projects and informed them about the various tools that were available at their disposal.

Academic Projects

Senior Design Project (09/22 - Present)

- Collaborated with a company called Synthera Health in a team of 3 to detect analytes for iron deficiency in human beings.
- Researched and developed a protocol for the detection of an analyte essential to detect iron deficiency.
- Ensured that the design of the product met the specifications given by the company.

Technology Innovation Company Proposal (09/22 - 12/22)

- Brainstormed with a team of 4 to develop a company proposal consisting of company setup, market and competitor analysis including projected financial statements.

Design Diagnostics Project (01/22 - 05/22)

- Coordinated with a team of 7 to design and test a pH sensor to be attached a home hemodialysis machine.
- Calibrated the sensor to ensure that it can detect the concentration of specific compounds in the patient's blood.
- Designed the device in a manner which allows to get easily attached to the existing setup.

Human Physiology Final Project (05/21 - 07/21)

- Designed a project to determine the effects of sleep deprivation and gender on maximum grip strength.
- Strategized with a team of 3 to design, test and analyze the data collected from twenty individuals.

Pulse Oximeter Project (09/20 - 12/20)

- Developed a Pulse Oximeter using an Arduino Uno and locally available parts.
- Wrote the Arduino code for the device to function.

Emily Boyce

erboyce@bu.edu ● 203-505-3515 ● Westport, CT

Education

Boston University, Boston MA
B.S. in Biomedical Engineering with a Minor in Business Administration — Expected May 2023

Relevant Coursework**:** Device and Diagnostic Design, Rehabilitation Engineering, Surgical Device Technology

Projects

SITA Application — May 2023
- Improved usability of SITA, an app for nonverbal children with autism to practice speech at home
- Tested capabilities of current speech algorithm
- Increased accuracy of app with new speech algorithm created in MATLAB

Clot Retrieval Device Paper — Apr 2022
- Reviewed and proposed changes to current models of clot retrieval devices as a group of three
- Researched and prioritized design requirements of device

CrankThat — Dec 2021
- Created an assistive tool for people with a lack of hand mobility in a group of four
- Researched user needs and market opportunity of device
- Wrote and presented business plan and product design specifications to fellow peers

Pulse Oximeter — Sep 2020
- Designed and 3D printed a pulse oximeter prototype
- Identified 4 main user needs from stakeholder interviews
- Coded Arduino prototype to measure oxygen levels and heart rate

Work Experience

Engineering Intern—Treat Wellness, Newton MA — Jun 2021 - Apr 2023
- Developed and wrote Standard Operating Procedures to use within practice for 7 outpatient medical procedures
- Researched and shadowed medical devices in use at practice
- Created 5 slide decks that were presented at medical conferences around nation

Tutor—Boston University Engineering Undergraduate Tutoring Center, Boston MA — Fall 2022
- Tutored Chemistry, Programming, Calculus 1 & 2, Physics, Linear Algebra
- Met 10-20 students a week, averaging 6hrs/week—tutoring multiple students in multiple subjects simultaneously

Tutor—Top Hat Tutors, Westport CT — 2018 - 2019
- Taught Biology, Calculus, Pre-Calculus, Algebra 1 & 2, Geometry, Chemistry, and Italian
- Tutored 3-5 students a week, averaging 8 hrs/week—held most hours per week compared to other tutors

Qualifications & Skills

Wet Lab: Bioprinter, gel electrophoresis, titration, spectrophotometry
Modeling: AutoCAD, SketchUp, Solidworks, Stella Architect
Programming: MATLAB, C, Python, and Processing
Languages: Italian (Advanced), French (Basic)
Leadership: 12 years as a Girl Scout—earned Gold Award, group fitness leader for CHAARG
Other Proficiencies: Statistical Analysis, Microsoft Office, G Suite

Connor Brashears

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EDUCATION

Boston University **Boston, MA**
Bachelor of Science in Biomedical Engineering Expected May 2023

- **GPA:** 3.80/4.0
- **Honors:** AFCEA ROTC Leadership Award (Lexington-Concord Chapter), College of Engineering Dean's List 2019, 2020, 2021, 2022
- **Coursework:** Physics 1&2, Electronics, Fluid Mechanics, Molecular Cell Biotechnology, Ship Systems Engineering, Naval Weapons Engineering, Leadership and Management

WORK & LEADERSHIP EXPERIENCE

Naval Reserve Officer Training Corps **Boston, MA**
Midshipman August 2019 – Present

- Planned a comprehensive curriculum designed to develop Midshipmen mentally, morally, and physically to commission as Naval Officers in the United States Navy upon graduation
- Commanded a company of over 40 Midshipmen conducting military training
- Executed a physical fitness training plan to ensure all Midshipmen exceeded physical fitness standards
- Organized the Boston University Pass in Review Ceremony, showcasing the Naval, Army and Air Force ROTC programs on campus
- Coordinated with local military units to obtain guest speakers capable of providing training value to Midshipmen
- Delivered countless presentations on military history and current events in order to professionally development of Midshipmen

HSM-35, Naval Air Station North Island **San Diego, CA**
Midshipman Summer 2022

- Trained in the MH-60R helicopter
- Shadowed Naval Aviators' day to day job in order to prepare for a career in Naval Aviation
- Performed hours in the MH-60R flight simulator conducting anti-ship and anti-submarine warfare exercises

USS Tripoli, Naval Base San Diego **San Diego, CA**
Midshipman Summer 2021

- Prepared USS Tripoli for INSURV, a congressionally mandated inspection required to clear a ship for continued service
- Completed bridge watch standing on a $3.3 billion warship

SKILLS, ACTIVITIES & INTERESTS

Skills: MATLAB, C, Arduino, qPCR, 3D printing (including bioprinters), team management, communication
Activities: Boston NROTC Consortium, Young Americans for Freedom (Boston University Chapter), Kappa Sigma Fraternity Brotherhood and Scholarship Chair

Grace Chabbott

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EDUCATION

Boston University College of Engineering *Expected May 2023*
Bachelor of Science in Biomedical Engineering Boston, *Massachusetts*
GPA: 3.42/4.00 • *Dean's List Fall 2020, Fall 2022*

Involvement on Campus: TAMID Consulting & Investment Fund Group, Biomedical Engineering Society

Relevant Coursework: Electric Circuits, Signals & Controls, Statistics & Probability, Systems Physiology, Transport Phenomena, Biomolecular Engineering, Device Design & Diagnostics, Thermodynamics & Statistical Mechanics

PROFESSIONAL EXPERIENCE

Alkeus Pharmaceuticals, Inc. *January 2023 – Present*
Clinical Trial Associate Intern *Cambridge, Massachusetts*
- Collect and analyze clinical trial data for novel therapies against degenerative eye diseases
- Verify data validity and review, maintain, and track clinical trial regulatory documents

Neurovascular Imaging Lab at Boston University *June 2022 – Present*
Undergraduate Researcher *Boston, Massachusetts*
- Perform fMRI and multiphoton imaging on mice to support research on non-invasive acetylcholine tracing
- Acquire and analyze multiplexed electrophysiological recordings using DAQ systems and MATLAB

Optics Lab at MGH/HMS Martinos Center for Biomedical Imaging *June 2022 – Present*
Undergraduate Research Assistant *Charlestown, Massachusetts*
- Manage a colony of experimental mice and use tools such as SoftMouse to track breeding progress
- Train vasodilator-labeled mice for MRI and photon imaging of brain

United Hatzalah of Israel *March 2019 – June 2019*
Volunteer EMT-B (Basic Emergency Medical Technician) *Jerusalem, Israel*
- Treated patients in a group setting using basic live-saving techniques such as CPR, AED, and abdominal thrusts
- Measured and interpreted patient vitals on-scene and mid-transport to hospital and delivered effective medical treatments in emergency situations

Ophthalmology Office of Dr. Arthur H. Gerber, M.D, P.C *Summer 2018, 2019, 2020, 2021*
Technician and Office Assistant *Brooklyn, New York*
- Conducted thorough eye examinations on 15+ patients/day with ophthalmologic devices such as visual field analyzer, auto-refractor, optical coherence tomography scanner, fundus camera, and pachymeter
- Coordinated general communication and workflow throughout office to create a positive experience for patients

PROJECTS

Engineering Mechanics Truss Design *March 2021 – May 2021*
- Designed a truss with maximized load supported/price ratio in a team of 4 students with different skill sets
- Wrote a MATLAB script employing mathematical model to determine buckling truss members under varying load

Pulse Oximeter Design *September 2020 – December 2020*
- Designed and assembled circuitry and housing for Arduino-based device to measure blood oxygen saturation
- Presented a working prototype with an error of 1% to a panel of BU engineering faculty

LEADERSHIP EXPERIENCE

Investment Fund Team Leader, BU TAMID Group *September 2020 – February 2022*
High School STEM Tutor/Mentor, Independent *Summer 2019, 2020,2021*

SKILLS

Technical: Advanced MATLAB, Basic C, Basic Python, Basic FIJI/ImageJ, PyMol, Fritzing, Basic SolidWorks
Lab: Microscopy, Spectrophotometry & Spectroscopy, Calorimetry, DNA purification, qPCR, Plasmid Extraction

Jeevith Chandrasekar

jeevith@bu.edu | 617-901-8734

EDUCATION

Bachelor of Science in Biomedical Engineering from Boston University Boston, MA | May 2023
Concentration in Technology Innovation
Relevant coursework: Statistics, Probability and Data Science for Engineers, Biomedical Measurements, Engineering Design, Technology Its Commercialization

WORK EXPERIENCE

COMMONWEALTH FUSION SYSTEMS | Product Development Intern Cambridge, MA | Sep – Dec 2022

- Strategized, implemented and designed new, more efficient solutions for various parts and manufacturing processes for SPARC nuclear fusion reactor.
- Balanced 40+ hours of work per week while completing a 20-credit semester.
- Presented potential designs to team members from varying sectors to solve problems effectively.

THERMO FISHER SCIENTIFIC | Product Development Intern Waltham, MA | May - Aug 2022

- Created an innovative solution to update and repair NetDose (a personal radiation measurement device) that saved over 300 hours of labor and lead to 90,000 USD in cost avoidance.
- Led project from start to finish consisting of designing a fixture in CAD from the ground up, as well as assembling, testing, machining, creating and organizing part numbers in the company database with utilization of Oracle's agile database and successfully implementing an ECO for product to be used on assembly floor.
- Presented solution to thirty plus employees including Chief Scientific Officer, various presidents and directors.
- Managed initiatives within numerous projects simultaneously and collaborated with various employees in different sectors.

PEACHTREE BIOREASEARCH | Data Analytics Intern Boston, MA/Marietta, GA | May – Aug 2021

- Analyzed financial and patient data-sets with over 100,000 data points for numerous clinical studies.
- Finished tasks significantly ahead of the due date and had position extended due to exceptional and impactful work.

VEE24 | Sales/Marketing Intern Boston,MA | May – Aug 2020

- Awarded best employee, "MVP", companywide in Q2
- Went above and beyond assigned roles and responsibilities and created "the most successful marketing campaign" in the company to date.
- Added and organized over tens of thousands of new potential clients. In addition, reached out and interacted with said clients on numerous occasions.
- Presented in numerous corporate meetings in front of C Suite employees.

PROJECTS

DRAPER | Bioinformatics, R, Big Data Boston,MA | Sep 2022 – May 2023

- Leading 1 of 3 groups selected to partake in a Draper backed project for senior design.
- Developing an automated pipeline for efficiently processing RNA-seq data with over 1 million data points, as well as a performed novel downstream bioinformatics analyses with utilization of R.
- RNA-seq data analysis to be implemented into the workflow for organ-on-chip (OOC) platform, PREDICT96.

PULSE OXIMETER | Arduino Based Boston,MA | Jan – May 2021

- Designed, coded and built a working pulse oximeter using an Arduino.
- Successfully measured blood oxygen levels and pulse accurately via reading from finger.

SKILLS

Applications: CAD, MATLAB, Microsoft Office, and Adobe
Coding: SQL, C, C++, R, Python
Languages: Proficient in Spanish

Oskar Cheranov

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EDUCATION

B.S., Biomedical Engineering, *Boston University* Expected May 2023
Clubs: BME Society, Data Science Association, VP of Finance for NeuroTechXBU

SKILLS

Technical Skills	Data Analysis, MATLAB, Python, C++, Java, Lab Skills & Protocols
Soft Skills	Communication, Teamwork, Public Speaking
Software	Office 365, Google Suite, Tableau, SolidWorks, ImageJ, VSCode, Android Studio

RESEARCH EXPERIENCE

Research Affiliate September 2022 – Present
Synthera Health *Boston, MA*
- Tested and validated blood diagnostic tests in laboratory
- Analyzed data in Python to characterize and optimize diagnostic test performance
- Designed image processing algorithm versions in C++ and Python using OpenCV libraries
- Implemented Machine Learning model to further optimize characterization of data
- Collaborated with UI team to implement design ideas into personal healthcare mobile app
- Currently developing mobile app for Android in C++ and Java

Project Lead September 2018 - May 2019
Center for Advanced Professional Studies *Kansas City, KS*
- Led team of 6 to model PETase, a novel plastic degrading enzyme, publish journal abstract detailing structure and function, and present on results and potential applications at ASBMB conference in Orlando, FL
- Individually analyzed data to evaluate protein engineering strategies for PETase using NCBI Blast and MATLAB scripts, and presented findings at the Greater Kansas City Science and Engineering Fair
- Wet lab training in cell culture, PCR and gel electrophoresis, chemical and microbiological assays, plasmid preparation, qPCR, and lab skills and protocols

WORK EXPERIENCE

Campaign Intern June 2022 - August 2022
Public Interest Research Network *Boston, MA*
- Collaborated on 2 environmental campaigns for nonprofits MASSPIRG and Environment Massachusetts
- Helped raise over $500,000 through grassroots organizing efforts in the Greater Boston Area
- Met with and successfully lobbied Massachusetts state level representatives to support including provisions on Bill H.5060 relating to fossil fuel free construction and clean transportation, signed into law August 11, 2022

PROJECTS

Price Database Tool Winter 2022
- Python web scraper that collects HTML and API JSON data of items from stores in Boston
- Imports data into MySQL database table and filters item data by location and price

SitDown Spring 2022
- OpenTable inspired website that allows users to place restaurant reservations
- HTML, CSS, and JavaScript front end with REST API, NodeJS and MongoDB back end

Forever Fresh Spring 2022
- Collaborated in team of 3 to develop business plans, market research, projected financial statements, and prototype design of food storage product for mock VC presentation

Truss Simulator Fall 2021
- Created MATLAB scripts that predicted axial compression and tension forces within a model truss
- Program also predicts total truss material cost, first member to fail, and max load-cost ratio

Pulse Oximeter for COVID-19 Patients Spring 2021
- Designed and 3D printed device to measure blood oxygen levels using SolidWorks and Arduino Uno

Nicholas Chong

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Education

Boston University (BU) College of Engineering | Boston, MA
Bachelor of Science in Biomedical Engineering — Expected May 2023
Pre-Medical in Modular Medical/Dental Integrated Curriculum (MMEDIC)
Cumulative GPA: 3.87, Dean's list: Fall 2020 - Spring 2022

Skills

Computer: MATLAB, C++, EPIC, SAP, Microsoft Office
Languages: English, Mandarin
Laboratory: Gel Electrophoresis, NMR, Mass Spec, UV Spec, IR Spec, Cell Culturing

Relevant Coursework

Polymers & Soft Materials, Biomaterials Science, Human Physiology, Cell Bio and Biotech, Organic Chemistry, Engineering Mechanics, Transport Phenomena, Thermodynamics, Signals & Controls, Electric Circuits

Research Experience

Massachusetts General Hospital | Boston, MA
Research Assistant (Dr. Annie Chan) — Jun – Aug 2021
- Trained Artificial Intelligence (AI) to predict malignancy of thyroid nodules based on ultrasound images for head and neck cancer diagnoses

Boston University School of Medicine Department of Ophthalmology | Boston, MA
Research Assistant (Taylor Lab) — Aug 2020 – May 2021
- Conducted cell culturing experiments to investigate effects of alpha-melanocyte stimulating hormone on immune privilege of eye
- Revised MATLAB code involving calculating fluorescence in quantifying macrophage activation

Work Experience

Massachusetts General Hospital | Boston, MA
Medical Assistant in Radiation Oncology Department — May – Aug 2021
- Measured vital signs of patients, carried out phlebotomies and assisted physicians with endoscopies
- Shadowed physicians, nurses and radiation therapists

National Service in the Singapore Armed Forces | Singapore
Combat Medic — Jan 2018 – Nov 2019
- Provided medical support in military exercises and medical center
- Awarded Resuscitation Merit Award – Good Performance in Resuscitation of a Serviceman

Projects

Senior Design Project | Boston, MA
- Created Predictive Models of Alzheimer's Disease Diagnosis in MATLAB Using Neuroimaging Features from Alzheimer's Disease Neuroimaging Initiative database (in partnership with Niji Neuroscience)
- Implemented new confidence ranking for classification of individuals using Support Vector Machines

Leadership & Activities

Tau Beta Pi Engineering Honor Society — Jan 2022 – present
Singapore Students Association President — Sep 2021 – May 2022
BU Biomedical Engineering Society (1st place in drug delivery Design-A-Thon) — Jul 2021
StarPALS (Palliative Advanced Life Support) medically-trained volunteer — Jan 2014 – Dec 2017

Cristopher Bailey Coco

Boston, MA 02134 | 603-560-6456 | ccoco@bu.edu

Education

Boston University College of Engineering GPA: 3.83/4.00 — Boston, MA
B.S. in Biomedical Engineering, Minor in Materials Science — Expected May 2023

Relevant Coursework

Polymers and Soft Material Science | Fluid Mechanics | Thermodynamics | Signals and Controls | Systems Physiology | Quantitative Neuroscience | Cell Biology | Clinical App. of Biomedical Design

Skills

MATLAB | Python | Microsoft Office | SolidWorks | Arduino | Google Workspace | TRPS | BCA Assay | SEC | Gel Electrophoresis | qPCR | Circuit Analysis and Design

Experience

Izon Science US Instrument Support Technician — December 2021 - Present

- Tested, diagnosed, and repaired clinical research instrumentation with a specific emphasis on developing methods to optimize and improve future design
- Collaborated with team in order to create and execute internal instrument quality control plan
- Utilized BCA assays, size exclusion chromatography, and TRPS to isolate and characterize diverse sets of customer extracellular vesicles on a particle by particle basis

Green Tribes Manufacturing Warehouse Associate — May 2021 - August 2021

- Collaborated within warehouse team with an emphasis on manufacturing hair care products
- Mixed components, filled bottles, and distributed various products according to client demands
- Enhanced inventory and storage system within warehouse to increase overall efficiency

Canobie Lake Park Rides Trainer — May 2019 - August 2020

- Trained and certified ride operators at various different amusement park attractions
- Communicated within leadership team to ensure effective overall ride operations
- Operated and tested ride machinery to ensure a safe, enjoyable guest experience

Projects

Senior Design Project: “Project Javelin” (DePuy Synthes) — September 2022 - Present

- Developed a process with promise to increase antibacterial effectiveness in medical implants
- Designed experiments to optimize key surface characteristics and maximize effectiveness
- Evaluated structure density, uniformity, and shape of results using SEM and optical microscopy techniques

“Pulse Oximeter”

- Designed, engineered, and prototyped pulse oximeter to measure oxygen saturation of blood
- Created functional pulse oximeter with easily accessible materials and resources
- Employed optical spectroscopy with photodetectors connect to an arduino to determine result

Mikayla Crowley

mikayla3@bu.edu · 203-848-7291 · www.linkedin.com/in/mikayla-crowley · Cheshire, CT

EDUCATION

Boston University College of Engineering | Boston, MA — Expected May 2023

B.S. in Biomedical Engineering, concentration in Technology Innovation

- Dean's List Fall 2019, Fall 2020, Spring 2021, Fall 2022
- GPA: 3.86

Relevant Coursework: MATLAB, Engineering Design, Circuits, Signals & Controls, BME Measures, Device Design

RELEVANT EXPERIENCE

Associate Clinical Specialist Intern | Medtronic | Boston, MA — May 2022 – Present

- Operated console to begin and end freezes for Cryoballoon Catheter during ablations in the EP lab to treat atrial fibrillation.
- Developed relationships with physicians and nurses in the Boston area hospitals.
- Completed learning modules on electrophysiology and the Cryoballoon ablation procedure to better assist physicians.

Co-Founder of Startup | Shop Swapp — October 2023 – Present

- Co-Founded online secondhand marketplace for BU students to buy and sell clothes and other items.
- Hosted in person clothing exchange events to demonstrate customer demand resulting in $9,500 in sales.
- Pitched to BU's student entrepreneurship program and obtained seed funding.

Junior Mechanical Engineer | Goddard Technologies | Beverly, MA — June 2021 – Aug 2021

- Designed and prototyped a testing harness using SolidWorks and 3D printing for automated vaccine delivery system.
- Programmed (C++, Java) an Arduino microcontroller to operate solenoid valves and pressure sensor.
- Presented progress to clients in weekly client meeting.

Virtual Internship in Biomedical Engineering (VIBE) | WPI | Worcester, MA — June 2021 – Aug 2021

- Worked in a group of five to design an umbilical cord clamp for a developing country.
- Participated in professional development seminars three to five hours a week.

SELECT PROJECTS

Automated Analysis of Human Electrodermal Activity — Aug 2022 – Present

- Collaborated with 10 research participants to collect autonomic nervous system and speech data.
- Analyzed human electrodermal activity with MATLAB by formulating a user-friendly automated software customized to the collection location: forehead, chest, fingertips, and shoulders.

Phrenic Nerve Monitoring Device — Aug 2022 – Dec 2022

- Conducted interviews with stakeholders including clinical specialists and physicians to identify a device need in surgery.
- Designed, programmed (C++), and tested a functioning device to inhibit phrenic nerve injury during Cryoablation procedures and presented start-up pitch deck to class.

COVID-19 Tinker Design Competition — Jan 2021 – May 2021

- Designed, built, and programmed (C++) a detection device to be worn as a hat to alert close contact to the face.
- Received second-place prize for accomplishments.

LEADERSHIP & COMMUNITY SERVICE

Boston University Division 1 Field Hockey | Boston, MA — Aug 2019 – Present

Maintained 20-hour a week D1 practice schedule with competition and travel on weekends.

Sophomore Engineering Mentoring Program, Mentor | Boston, MA — Aug 2021 – present

Mentor group of 25 sophomore Biomedical Engineering students.

SKILLS

SolidWorks, MATLAB, C, Arduino, Java, Microsoft: Excel, SQL server, PowerPoint, 3D printing

Aiyana Cubias

acubias@bu.edu | 617-631-2402 | Randolph, MA | linkedin.com/in/aiyanacubias

EDUCATION

Boston University College of Engineering Boston, MA
Bachelor of Science in Biomedical Engineering Expected May 2023
Relevant Coursework:
General Chemistry Mechanical and Electrical Physics Principles of Molecular Cell and Biotechnology Biology
Biomedical Signals & Controls Biomedical Advanced Controls Fundamentals of Biomaterials Circuits

SKILLS

Languages: Python, C, C++, MATLAB, Spanish
Applications: Arduino, Microsoft Excel, PowerPoint, Word, CAD
Laboratory: Polymerase Chain Reaction, Pipetting, Sterilization, Scientific Method, Electron Microscopy, Fluorescence Microscopy, Gel electrophoresis

PROFESSIONAL EXPERIENCE

Pfizer Boston, MA
DMTI Imaging Research Intern May 2022 – September 2022

- Performed data analysis for liver study to obtain comparative results on biomarkers
- Imaged patients' livers via Fibroscan to assess liver fat and stiffness for clinical trial eligibility
- Segmented specific body regions in micro-CT scans to provide data for AI auto-segmentation project

Horizons Homeless Shelter for Children Boston, MA
Playspace Volunteer December 2019 – October 2021

- Held play space for children and monitor children's safety
- Planned activities for children to promote learning and engagement
- Managed activities with children to track growth and development

QurAlis Corporation Cambridge, MA
Lab Operations Assistant June 2021 – August 2021

- Converted lab inventory to an automated and digital system to have a proper lab workflow
- Handled machine maintenance and function to-ensure Cryotank receives proper levels of liquid nitrogen
- Fed cell line in tissue culture with basal media and split iPSC into additional petri dishes for future freezer storage

Mayors Office of Workforce Development Boston, MA
Career Coach July 2020 – August 2020

- Hosted virtual web seminars and study sessions for 25 students
- Collaborated with students taking a psychology summer course at Benjamin Franklin Institute of Technology
- Planned professional workshops and virtual presentations for 100+ students' development

Primark Boston, MA
Retail Associate June 2017 – September 2019

- Responded to customers in fitting rooms
- Organized hangers and tags in orderly manner
- Filled shelves with clothing to enhance customer experience

SELECT PROJECTS

Niji Corp Boston, MA
Alzheimer's Disease Classification Project September 2022 – Present

- Developed an independent project using data acquired from ADNI database to study MRI images' features of neurological impairments in Alzheimer's Disease and cognitively impaired patients
- Processing MRI images' features with the use of machine learning classification models to build a predictive algorithm for Alzheimer's Disease

Jenny Deng

jennyd@bu.edu | 646-881-3106 | Boston, MA

EDUCATION

Boston University College of Engineering | Boston, MA — Expected May 2023
Bachelor of Science in Biomedical Engineering — GPA: 3.90/4.00 (Dean's List)

RELEVANT COURSEWORK

Molecular Bioengineering	Biomedical Materials Science	Biomedical Signals & Controls
Molecular Cell Biology & Biotechnology	Biomedical Measurements	Probability, Statistics & Data Science

SKILLS

Programming: MATLAB, C, Python
Computer: Arduino, Microsoft Word, Excel, PowerPoint, ImageJ, FlowJo, Benchling
Laboratory: Pipetting, titrating, sterilizing, circuit mapping on breadboard, designing primers, Gibson assembly, bacterial transformation, miniprepping, midiprepping, restriction digest, PCR, transfection, electroporation, cell culture

PROJECTS

Designing a Library of Red-Light Inducible Recombinases, Wilson Wong Lab — May 2022 – Present
- Researched prior chemical and light-inducible systems and adapted them to creation of novel application involving the combination of red-light domains with split recombinase fragments
- Cultured and maintained HEK-293 and Jurkat cells for transfection and electroporation
- Analyzed flow cytometry data against desired metrics to evaluate efficiency of inducible systems
- Awarded funding from the STEM Pathways program for summer 2022

Analyzing Genetically Encoded Tension Sensors, Sgro Lab — Sep 2021 – May 2022
- Investigated different genetically encoded vinculin tension sensors in 3T3 fibroblasts for novel application of studying localized cell tension with Ca2+
- Awarded BU's Undergraduate Research Opportunities Program fund for Spring 2022 semester

Designing a Glucose Meter for Infants, WPI VIBE Program — Jun – Jul 2021
- Researched current market glucometer designs and different glucose concentration indicators
- Collaborated in a team of 4 to review novel design ideas and to produce a proof of concept
- Produced a 4-minute YouTube video of design process, garnering 265 views and 32 likes

Constructing a Truss, Engineering Mechanics I — Jan – Apr 2021
- Organized weekly 2-hour meetings outlining expectations for team to achieve before next meeting
- Acted as primary liaison for team and professors and teaching assistants, seeking help when necessary
- Computed manually truss analysis using method of joints and sections; computations served as verification for computer model
- Optimized final truss design and actualized said design using acrylic strips and filament tape for virtual testing

Creating a Pulse Oximeter, Introduction to Engineering Design — Sep – Dec 2020
- Created, coded, and modeled workings of a pulse oximeter using Arduino Uno and Arduino IDE
- Researched physical, biological, and mathematical fundamentals of light absorption through tissues
- Constructed function-means and bill-of-material charts to craft a glass-box analysis of mechanisms in a pulse oximeter

EXPERIENCES

Researcher, Sgro Lab & Wilson Wong Lab | Boston, MA — Sep 2021 – Present
- Experimented with cloning ultrasensitive Ca2+ indicators (YCNano-140) and red-light inducible systems in Flp and VCre recombinases under tutelage of mentors
- Formulated, proposed, and presented projects that filled in gaps and added to knowledge within the following fields of synthetic biology: optogenetics and genetic circuits

LEADERSHIP & ACTIVITIES

Society of Women Engineers (SWE) at Boston University, Secretary — Sep 2019 – Present
Boston University Girls Who Code, Member — Nov 2019 – Present

ALEXANDRA DOLYNUK

adolynuk@bu.edu • (203) 584-6032 • linkedin.com/in/alexandradolynuk

EDUCATION

Boston University College of Engineering Boston, MA
Bachelor of Science in Biomedical Engineering, summa cum laude Expected May 2023
Minor in Computer Engineering, Concentration in Machine Learning
Semester Abroad at University of Sydney
GPA: 3.93/4.00 (Dean's List 7 semesters)

PROFESSIONAL EXPERIENCE

BU Wong Lab - ***Undergraduate Research Opportunities Student***, Boston MA Sep 2022 - Present

- Evaluating CAR T Cells with AND gates in effectiveness in targeting cancer cells with variable antigen expression levels by varying hinge domains and activating domains
- Designing and constructing plasmids, transducing T cells with lentivirus, and testing various combinations of AND gates of the split universal CAR T cell design

Boston Youth Symphony Orchestra - ***Production Assistant***, Boston MA Sep 2020 - Present

- Coordinated orchestra rehearsals and assisted in the production of concerts for federal work study

USYD Neely Lab - ***Research Intern***, Sydney AU Jan 2022 - June 2022

- Cultured and analyzed Tasmanian devil facial tumor cells to determine effect of different protein coatings on cell adhesion and proliferation; increased proliferation rate by 15%
- Proliferated mammalian cells and performed qPCRs, purification procedures, and viability assays

BU Dunlop Lab - ***Undergraduate Researcher***, Boston MA June 2021 - Dec 2021

- Researched and characterized an optogenetic system, eLightOn, by genetically engineering *E. coli* to express fluorescence when exposed to blue light
- Performed PCR, pipetting, Gibson Assemblies, and primer design on Benchling software and in lab
- Analyzed cell activity using plate reader, flow cytometry, microfluidics, and microscopy

Born Global - ***Sustainability Innovation Intern***, Portland ME May 2020 - Jan 2021

- Collaborated in specialized group of 5 members to explore biomimicry as a sustainable methodology to apply to carbon dioxide management for a biomass power plant located in Fitchburg, ME
- Conducted research through reviewing literature and interviewing field specialists

PROJECTS

White Matter Lesion Quantification from Structural Brain Images Oct 2022 - Present

- Senior design project in extracting novel features from raw neuroimaging data in the Alzheimer's Disease Neuroimaging Initiative database to feed predictive models for Alzheimer's disease
- Coding and training classification models in MATLAB to predict for Alzheimer's disease based on traditional volumetric measures compared with the addition of novel vascular degeneration features with error rate of 9%

Tissue Engineering Novel Research Proposal June 2022

- Managed a team of 7 in writing a novel research proposal on the fabrication of a silk fibroin hydrogel scaffold to place in in the anterior chamber eye to release insulin in patients with diabetes mellitus

UnderSound App Dec 2020

- Led team of 4 to design and build an Android application for "underground" (bottom 10% popularity) song recommendations and playback by delegating tasks and organizing weekly meetings
- Designed and implemented client request handlers based on user input of track, artist, and genre seeds by applying the Spotify Web API

SKILLS

Wet Laboratory: mammalian cell culture, bacterial cell culture, gel electrophoresis, qPCR, PCR, Gibson cloning, transformation, microfluidics, flow cytometry, microscopy, thermocycler, pipetting, centrifuge, TC hood, vacuum manifold, Benchling, midi/mini prep, gel extraction, backbone digests, electroporation
Computer: MATLAB, Python, C, C++, scikit-learn, Git, GitHub, Android Studio, Arduino, SolidWorks, Linux

Eren Ergene

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EDUCATION

Boston University, College of Engineering Boston, MA
B.S. in Biomedical Engineering, Concentration in Nanotechnology Expected May 2023
GPA: 3.13/4.00
Relevant Coursework: Optical Microscopy, Systems Physiology, Nanotechnology, Molecular Bioengineering, Thermo, Biomedical Signals & Controls, Biomedical Measurements, Electric Circuits, Programming, Eng. Design

EXPERIENCE

Boston University Boston, MA
Teaching Assistant Jan 2022 – Present
- Assist professors in teaching of three classes: Hands-on Engineering, Eng. Design, and Electric Circuits.
- Lead office hour sessions to teach engineering students about 3D printing, circuit wiring, and CAD.
- Grade assignments and give feedback on lab reports, quizzes, midterms, and final exams.

BU Optical Characterization and Nanophotonics Laboratory Boston, MA
Research Assistant Sep 2021 – Present
- Collaborate with professor and graduate students to perform research on Interferometric Reflectance Imaging Sensor (IRIS) technology, a biosensor for label-free detection of biomolecular binding.
- Design, manufacture, and assemble a quality control device and test multiple color cameras to adapt IRIS to multicolor image acquisition as opposed to monochrome imaging.
- Analyze reflectance properties in MATLAB for varying LED colors, oxide thicknesses, and refractive indices.

iRiS Kinetics Boston, MA
Research Intern May – Aug 2022
- Designed a novel multicolor imaging system by controlling LEDs by Python to achieve LED - camera synchronization, eliminate bulk effect, and acquire more sensitive molecular binding results.
- Developed software in MATLAB to efficiently acquire, process, and analyze images, implement ROI selection, and calculate thickness of oxide layer on silicon chip according to reflectance simulations.
- Conducted experiments for varying FPS and camera settings to optimize image acquisition parameters.
- Generated reflectance calculations for various LEDs to determine ideal choice of LED colors.

Dentsply Sirona Istanbul, Turkey
Production Intern Jun – Aug 2021
- Scanned teeth models from patients using CEREC Omnicam digital camera.
- Designed 3D teeth by utilizing CAD to modify scanned models and print using a CNC 3D Printer.
- Attended education sessions on usage of CEREC in case studies along with several dentists and interns.

SELECTED PROJECTS

SNP (Single Nucleotide Polymorphism) Detection for Drug Resistance Analysis Sep 2022 – Present
- Design DNA probe sequences and do DNA melting experiments to detect presence and type of SNPs.
- Modify surface chemistry by increasing length of spacer between probe and chip surface and using biotinylated probes and streptavidin-coated surfaces to immobilize DNA samples.
- Develop and enhance experiment procedures to interpret data automatically and more accurately.

Pulse Oximeter Jan – May 2021
- Performed various engineering tasks such as coding in Arduino IDE, circuit wiring, and soldering.
- Presented final product to a class of 20 students and professor.

Additional Projects: DMD Research Project, Pet Classification, Truss Design

SKILLS

Computer: MATLAB, Python, Onshape, Solidworks, COMSOL Multiphysics, Arduino IDE, MS Office
Mechanical: Electrical Circuit Wiring & Soldering, 3D Printing, Drill Press

Soumaya Fayie

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EDUCATION

Boston University College of Engineering **Expected May 2023**
B.S. in Biomedical Engineering, Concentrations in Technology Innovation and Nanotechnology
Relevant Coursework: Biomaterials, Nanotechnology, Biomaterials, BME Measurements, BME Diagnostics and Design

SKILLS

Language: Fluent in Arabic, Fluent English
Computer Skills: Matlab, C++, Microsoft Office, Google Suit, Arduino, Solidworks
Lab Skills: 3D Printing, Laser Cutting, QTpcr, Auto Lab, RNA Extraction, RT-qPCR, Electrophoresis, Gene Cloning

EXPERIENCE

Klapperich Lab, *Boston University* **Jun 2021 - Present**
Research Assistant **Boston, MA**
- Gathered, processed and tested wastewater samples collected from a Boston University for Covid-19 shedding testing
- Filtered and tested wastewater samples through using a Qiagen kits and qtPCR tests+ positive
- Awarded twice for (UROP) undergraduate research funding

BioElectronics Lab, *King Abdullah University of Science and Technology* **Jun - Aug 2022**
Research Assistant **Thuwal, KSA**
- Tested and developed a gold electrode biosensor to detect early stage Parkinson's disease
- Collaborated with Cambridge University to test sample of Parkinson's positive patients(receiving samples and assessing potential positive patients)

Computational Bioscience Lab, *King Abdullah University of Science and Technology* **Jul - Aug 2017**
Research Assistant **Thuwal, KSA**
- Identified SNPs responsible for Cardiovascular diseases in the Middle East through Big Data Analysis

PROJECTS

White Mater Lesion Quantification from MRI Images **Sep 2022 - Present**
- Analyzed and processed MRI brain scans of Alzheimer patients for quantification of white matter lesions

Cervita (Vacuum Suction IUD Insertion Machine) **Sep - Dec 2022**
- Built a device to replace the surgical tenaculum in IUD insertion procedures to make it less invasive

WuX **Jul - Dec 2021**
- Founded an initiative app motivating for a healthy lifestyle culture by offering incentives(created)
- Presented and pitched WuX to VCs of multiple fields in a competition in Saudi Arabia

Medicine Dispenser **Jun - Aug 2020**
- Constructed a timed medicine dispenser to aid elderly in accurate dose
- Coded specific functions on arduino using python dispense and sense medicine at desired rate and time

Electric Guitar **Jan - May 2020**
- Built, carved and sanded an electric guitar base
- Designed an electric circuit which connects musical chords needed and operates on a commercial amplifier

HONORS & AWARDS

KAUST Gifted Student Program (KGSP) Scholarship
- Awarded a full scholarship to a US university that targeting top-performing Saudi students

Misk Fellowship Program
- Participated in leadership development programs targeting distinguished youth to hold high positions in KSA Vision 2030
- Highly selective program of 50 accepted out of 30,000 applicants

LEADERSHIP & ACTIVITIES

Senior Chair, BU Engineering Government **Nov 2022 - Present**
Mentor, Biomedical Engineering Society **Sep 2022 - Present**
Dean Host and Engineering Ambassador, Boston University **Aug 2022 - Present**
President & Advisor, Saudi Cultural Club **Sep 2020 - Present**
International Peer Mentor, Boston University **Aug 2020 - Jul 2021**

Andrew Finebaum

afinebau@bu.edu | 310-968-4472

Education

Boston University College of Engineering Boston, MA

Bachelor of Science (BS) in Biomedical Engineering; Minor in Mathematics May 2023

Relevant Coursework:

SIGNALS AND CONTROLS|STATISTICAL THERMODYNAMICS|INTRO TO BIOMATERIALS|SYSTEMS PHYSIOLOGY|BIOMEDICAL MEASUREMENTS|INTRO TO ENGINEERING DESIGN|MOLECULAR BIOLOGY|FLUID MECHANICS|MOLECULAR BIOENGINEERINGMETHODS OF SCIENTIFIC COMPUTATION

Activities: Biomedical Engineering Society

Computer Skills: MATLAB, Python, CAD, Arduino, Julia, ImageJ, Paint 3D

Research Skills: PCR, gel electrophoresis, restriction enzyme digests, fluorescence microscopy

GPA: 3.09

Relevant Experience

Massachusetts General Hospital Intestinal Bioengineering Research Laboratory

Undergraduate Research Assistant Oct 2022 - Present

- Synthesized hydrogels of variable stiffness with collagen coating for two-dimensional organoids
- Cultured intestinal stem cells and stained tissues using immunohistochemistry
- Illustrated figures and graphs for publications

UC San Diego Advanced Materials Research Experiences for Undergraduates (REU)

Summer Undergraduate Researcher-Golden Lab June 2022 - Aug 2022

- Developed various strains of cyanobacteria and E.coli to to test motility, phototaxis, multicellularity, and biofilm formation within sodium alginate hydrogels
- Engineered a luciferase reporter gene sequence in *Synechococcus elongatus* to measure mechanism of protein secretion in hydrogels via bioluminescence
- Trained with materials characterization instruments: Raman Spectroscopy, Fourier-Transform Infrared Spectroscopy, Contact Angle Goniometry, Rheometer, and thermogravimetric analysis
- Presented research at UCSD summer research conference

Empow Studios Virtual Summer Camp

Lead Instructor May 2021 - Sep 2021

- Taught students from grades 2-5 various coding and STEM related projects and programs
- Instructed students on SculptGL, Scratch, Python, FlowLab, WickEditor, AutoCAD

Project Experience

Biomedical Senior Design

Nanorod Coating for Orthopedic Applications Sep 2022 - May 2023

- Developed and characterized nanorod arrays of100 nanorods/μm^2 to aid in reducing infection of orthopedic implants under supervision of DePuy Synthes
- Observed with scanning electron microscopy and confocal microscopy
- Lead 4-member group in activities and coordinated instrumentation and lab work

Kfir T. Flank

Boston, MA | 216-318-5677 | kflank@bu.edu

EDUCATION

Boston University College of Engineering Boston, MA
BS in Biomedical Engineering, BS in Computer Engineering (dual major) **September 2019 - May 2023**
Cumulative GPA: 3.35
Relevant Coursework: Software Engineering, Machine Learning, Applied Algorithms, Logic Design, Computer Organization, Circuits, Systems & Controls, Systems Physiology, Biomedical Measurements, Biomedical Design

BIOMEDICAL ENGINEERING PROJECTS

Senior Design: Alzheimer's Model Development **September 2022 - Present**

- Developed models using machine learning and MRI imaging data to help detect Alzheimer's at an earlier age.
- Conducted a literature review to determine white matter lesion as the focus of project development.
- Utilized Free Surfer image segmentation to extract novel features for model design and implementation.
- Created a pipeline using Free Surfer and Lesion Segmentation Tool to be able to segment white matter lesions.

Pulse Oximeter **December 2022 - May 2022**

- Designed and manufactured an improved version of a pulse oximeter to account for skin color bias.
- Implemented circuitry and ergonomic principles to redesign the pulse oximeter to fit an ear.
- Collaborated with a team to prototype and present multiple designs to an engineering panel.

COMPUTER ENGINEERING PROJECTS

Document Analyzer **December 2023 - May 2023**

- Designed and developed a document analyzer to determine sentiment of PDF files.
- Implemented a queuing system with threading to optimize system performance allowing multiple requests to be processed simultaneously.
- Utilized a Mongo database to store and pull user data for efficient extraction of document information.

Terrier Fitness App **November 2021 - December 2021**

- Designed a fitness app using Swift framework allowing customization and creation of workouts.
- Added features such as auto generation of workouts to target specific muscle groups.
- Adapted user friendly features such as repetition and weight editing to accommodate both experienced and amateur gym goers.

WORK EXPERIENCE

Lab Intern **June - August 2021**
Turbulence Structure Laboratory | Tel Aviv University Tel Aviv, Israel

- Programmed MATLAB scripts for 3D image reconstruction to analyze fluid movement.
- Integrated high resolution cameras in MATLAB to record fluid motion.
- Set up laboratory equipment, such as cameras, turbulent water experimentation setup, etc.

LEADERSHIP

Emmerson Fellow, StandWithUs **July 2022 - Present**

- Attended a training and education conference to learn history, detection, and ways of combating antisemitism on campuses.
- Hosted and participated in events to educate the community on antisemitism, and how to respond.

Treasurer, Boston University Triathlon Team **September 2019 - Present**

- Responsible for team finances and creating net positive income through fundraisers and alumni outreach.
- Corresponded and collaborated with club sports administration to plan events and races.
- Managed and lead practices for over 30 club members.

Student advisor, EK 100 **September 2020 - May 2021**

- Instructed EK 100, an engineering seminar course for first year engineering students, at Boston University.
- Educated students about resources on campus, strategized personal plans for success in the program, and taught ethics in engineering for 15 students.
- Advised and checked in with students about academic and social life during the pandemic.

SKILLS

- Computer: MATLAB, C, C++, Python, Swift, C# (.net framework), Solidworks.
- Language: Hebrew, English.

Hailey Alexis Fox

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EDUCATION

Boston University Boston, MA — Expected May 2023
Bachelor of Science in Biomedical Engineering

Relevant Coursework: Aerodynamics and Gliders, Electric Circuits, Principles of Molecular Cell Biology and Biotechnology, Signals and Controls, Thermodynamics, Genetics, Immunology, Introduction to Software Engineering, Molecular Bioengineering, Neurotechnology Devices, Fluid Mechanics, Device Diagnostics and Design

EXPERIENCE & LEADERSHIP

Research Assistant — Nov 2021 - Oct 2022
Bio Optical and Acoustic Spectroscopy (BOAS) Lab, Boston University

- Designed and printed parts using SolidWorks
- Collected physiological signals and examined their fit to physical models of body function
- Assisted with functional near-infrared spectroscopy (fNIRS) setup, data acquisition, and cleanup
- Worked to develop a novel optical brain measurement

Ambassador — Sep 2018 - May 2020
Technology Innovation Scholars Program (TISP), Boston University

- Collaborated with other undergraduate students to create a curriculum of complex engineering topics to present to K-12 students
- Traveled to local Boston, MA schools to teach groups of 30+ students about engineering and the its importance in our daily lives through fun and interactive activities

Retail Store Manager — May 2018 - Apr 2020
The Lemon Tree (seasonal), Chautauqua, NY

- Led and executed financial duties including purchasing, pricing, payroll, and tax audit
- Managed employee relations through conducting interviews, hiring staff, and creating work schedules
- Assessed store supply chain to implement a standard efficient process that forecasted sales and product trends

PROJECTS

Smartphone Based Detection and Monitoring of Skin Jaundice in Newborn Babies — Sep 2022 - Present
Senior Project, Rathi Creative Inc.

- Collaborated with a team of 4 engineers in design and development
- Completed a literature review on relevant research
- Created and analyzed liquid tissue phantoms to simulate jaundice in sclera

Postural Orthostatic Tachycardia Syndrome Monitoring Device — Sep - Dec 2022
Device Diagnostics and Design

- Studied current literature and conducted interviews with POTS patients to compile background research
- Developed a wearable vital-tracking prototype to accurately detect and monitor episodes of syncope

CO-CURRICULARS

YPO Next Generation (YNG) Member — Oct 2019 - Present
Alpha Epsilon Phi, Member — Feb 2018 - Present
The Orchards Nursing Home, Activities volunteer — Jan 2008 - Present

SKILLS

Computer: MATLAB, C++, SolidWorks, LabScribe, Microsoft Office, Pylon Viewer, Homer3
Technical Skills: fNIRS, spectroscopy, Finapres, Research & Design, Product Innovation, literature review
Other: Skiing, rowing, piano, sailing, Spanish, interior design, cooking and baking

Jason Gashi

jgashi@bu.edu • (857) 417-9033 • www.linkedin.com/in/jason-g-792113140/ • Boston, MA, 02135

Education

Boston University
Candidate for Bachelor of Science in Biomedical Engineering — Expected May 2023

Projects

Boosting the Chemotherapeutic Effect of Cancer Drugs using Focused Ultrasound (FUS) — Sep 2022 - May 2023
- Conducted focused ultrasound sonication on 15 nude immunocompromised female mice that were injected with human cervical cancer cells and cisplatin cancer drug to determine the effect of FUS on cisplatin treatment efficacy

The Relieve Sleeve — Jan 2022 - May 2022
- Developed and prototyped an affordable, easy to use, and comfortable arm sleeve that integrates a TENS machine for people suffering with diabetic neuropathy and peripheral nerve pain

Effects of Music on Heart Rate and Anxiety — Nov 2021 - Dec 2021
- Composed a mock Grant Proposal for a project to measure the effects of music genre on heart rate and anxiety
- Tested 30 subjects with an ECG and concluded statistical significance of music's effect on heart rate

Pulse Oximeter Design — Dec 2020
- Designed and prototyped a pulse oximeter using CAD, Arduino, and a photoelectric sensor
- Programmed LCD to display measured blood oxygenation levels and applied LEDs to alert if user has hypoxia

Engineering Mechanics Truss Design — Oct 2020
- Developed a MATLAB mathematical model which uses truss matrix inputs to predict the system's buckling members, internal tensions, and max loads
- Constructed a truss based off of projected patterns and calculations from the mathematical model

MATLAB Machine Learning — Dec 2019
- Utilized MATLAB Machine Learning Regression Learner to foretell starting/ending coordinates and types of storms in America
- Applied 60,000 data points of storm coordinates, type and magnitude throughout the U.S. to create a prediction regression

Work Experience

Intern at Brigham and Women's Hospital, Boston, MA — Jul 2016 - Jan 2023
- Operated an electron microscope to scope kidney tissues of patients with kidney pathology
- Archived microscope slides and tumors for Gastroenterological Cancer patients at Pathology Department
- Processed urine and saliva samples of patients with endometriosis at the OBGYN Epidemiology Department
- Coded statistical analysis using STATA on patient data from a Partners in Health emergency medicine project
- Installed, calibrated, repaired and inspected hospital devices in the Biomedical Engineering Department
- Performed Preventive Maintenance and Electrical Safety tests on devices brought to the Biomed shop
- Conducted Quality Control and aliquoted and handled DNA samples at the Partners' Biobank
- Set up TaqMan PCR assays for genotyping

Intern at Massachusetts General Hospital, Boston, MA — Jul 2017 - Aug 2019
- Performed immunohistochemistry on brain tissue
- Examined astrocytes and microglia under a fluorescent microscope
- Cultured and examined neurons and fibroblasts under confocal microscope
- Established an Angelman Syndrome EEG and genotype database

Activities

Albanian Student Association — Sep 2021 - Present
Boston University Men's Rugby Football Club (Match Secretary) — Jan 2020 - Present
Boston Public Schools Community Service Scholar — Sep 2019 – Present

Skills

Computer: MATLAB, C, Machine Learning, Google Products, Excel, STATA, Arduino, LabScribe, Onshape (CAD)
Laboratory: Immunohistochemistry, Western Blots, Antigen Retrieval, Cell Culture, Electron and Confocal Microscope, Gel Electrophoresis, PCR, Mice Handling, Focused Ultrasound

Naimah Gill

Boston MA, (512) 955-4877, naimah.h.gill@gmail.com

Education

Boston University College of Engineering Boston, MA
Bachelor of Science in Biomedical Engineering Expected May 2023

Relevant Coursework: Cellular Biology, Introduction to Machine Learning, Signal Processing, Thermodynamics and Fluid Statistics, Clinical Biomedical Design

Projects

Rectal Cancer Diagnostic Device Design -Senior Design Project

- Developed device to take multi-spectral 360° images inside of rectal canal to diagnose rectal cancer
- Build program in python to stitch captured images creating digital representation of entire rectal canal
- Use Solidworks to organize internal components within size constraints of current technologies

Multi-Use Grip Aid for Arthritis Patients Device Design - Engineering Design Class

- Designed device to help patients with hand arthritis hold onto everyday objects between 2 cm and 7cm in diameter
- Interviewed patients and professionals to determine product marketability
- Fabricated and tested working prototype of device

Pulse Oximeter Design- Engineering Design Class

- Devised a device utilizing properties of red and infrared light to measure oxygen level of blood
- Studied principles of light absorption in the gold standard of pulse oximetry devices
- Interviewed doctors and patients about experiences with pulse oximeters in hospitals
- Constructed and tested a working prototype of a pulse oximeter employing an Arduino and light sensors

Relevant Experience

Veterans Affairs Summer Research Program Boston, MA
Student Researcher June - September 2022

- Designed model mimicking colorectal system for medical device testing
- Developed and polished probes for Electromagnetic Scattering Spectroscopy (ESS) to test for light absorbance and scattering
- Leveraged CAD to design a model of and mold for a colorectal canal phantom
- Authored an abstract describing current and future projects occurring in lab
- Presented summer research at the Annual Biomedical Research Conference for Minoritized Scientists Managed by The American Society for Microbiology
- Implemented a new organization method to keep track of lab devices; reduced amount of time spent searching for lab equipment

Skills

Software: Solid Works, Matlab, Python, Arduino, Microsoft Office
Laboratory: ESS, Pipetting

Activities

Society of Women in Engineering Member August 2021-Present
Boston University Egyptian Club Vice President January 2023-Present

Melissa Gillis

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EDUCATION

Boston University College of Engineering **Boston, MA**
Bachelor of Science in Biomedical Engineering concentrating in nanotechnology May 2023
Minor in Mechanical Engineering and Dance
GPA 3.65/4.0
Relevant Coursework: Fundamentals of Biomaterials, Physics of Life (Princeton University)

RESEARCH EXPERIENCE

Research Assistant, Grinstaff Lab BU Boston, MA (Feb 2021 - present)

- Fabricated, optimized, and characterized solid lipid nanoparticles (NPs) leading to a patent for palmitate NPs and tested the NPs ability to inhibit viral proliferation of SARS-CoV-2 in vitro
- Developed polymeric NPs to act as a nano lubricant to combat osteoarthritis then conducted diffusion studies, mechanical tests, and confocal imaging on cartilage explants to quantify the NPs
- Constructed ultra-high loading polymer-drug conjugated NPs for cancer treatment, and investigated how free and conjugated drugs within the NPs affect drug release rates

Research Intern, Imaging Platform, Broad Institute Cambridge, MA (May 2022 - present)

- Designed a model to segment and analyze Collagen IV fibers in fluorescence images for the Gaborski NanoBio Materials lab and wrote an instructional blogpost series on fiber segmentation
- Constructed a pixel classification model to quantify collagen fibers in histopathological mouse lung images (provided by the Barzcak lab at the Rogan institute) to examine Tuberculosis' effect on lung tissue

PUBLICATIONS & AWARDS

Joenathan, A. T.; Gillis, M.; Taylor. M.; Snyder, B. D.; Grinstaff, M.W., Hydrophobic PGC Nanoparticles Enhance Lubrication between *ex vivo* Cartilage Surfaces as a Potential Early-Stage Intervention for Osteoarthritis. (In Preparation to *ACS Nano/Nanoscale*)
Joenathan, A. T.; Lawson, T. B.; Sabatelle, R.; Gillis, M.; Taylor. M.; Korunes-Miller, J.; Tingley, B.; Snyder, B. D.; Grinstaff, M.W, Engineering Nanoparticles to Lubricate and Preserve *ex vivo* Cartilage Tissue during Early-stage Osteoarthritis. (In Preparation to *ACS Nano/Nanoscale*)
Joenathan, A. T.; Gillis, M.; Lawson, T. B.; Taylor. M.; Snyder, B. D.; Grinstaff, M.W, Restoring Chondroprotection to Synovial Joints during Early-Stage OA using Hydrophobic PGC Nanoparticles. *Orthopaedic Research Society Convention 2023.* (Accepted Poster Presentation)
Trustee Scholar Award: Full scholarship at Boston University for academic excellence (Sep 2019 - May 2023)
Undergraduate Research Opportunities Program: Three time recipient for undergraduate research fellowship and presented a poster at the annual UROP Conference (February 2022 - May 2022)

LEADERSHIP & ACTIVITIES

Resident Assistant (RA), BU Residents Life (Sep 2021 - present)

- Fostered a safe and inclusive community for BU students

BU Turkish Student Organization, Events Coordinator (Mar 2022 - present)

- Organized and managed Turkish cultural nights for students in the BU community

Inspiration Ambassador, Technology Innovation Scholars Program (TISP) (Sep 2020 - May 2022)

- Educated highschool students about Prof. Russo's Soft Robotics research by creating and presenting an interactive activity, taught students coding through First Lego League, and judged high school science fairs

BU Dance Theater Group, Ballet Variations Project (BVP) (Feb 2022 - May 2022)

- Founded BVP, the first ballet performance group BU has had in over a decade, created choreography, arranged music, coordinated lighting and costume design

SKILLS

Laboratory: Polymer synthesis, Cell culture, NMR, GCMS, DLS, Optical microscopy, Scanning Electron Microscopy (SEM), NP fabrication, Lyophilizer, Sonicator, Glove Box,
Computer: Matlab, C, Python, R, SOLIDWORKS, Image J, ilastik, CellProfiler, Cellpose, Microsoft

Chloe Grubb

chloefgrubb@gmail.com • (949) 331-0759 • https://www.linkedin.com/in/chloe-grubb/ • Boston, MA

Education

Boston University
Bachelors in Biomedical Engineering, August 2019 – May 2023
GPA: 3.43

Work Experience

Takeda — Lexington, MA
Drug Product Device Development Intern June 2022 – August 2022
Supported test and design staff engineers with new product development:

- Created a LyoTwist Ypsomed product model in SolidWorks
- Reviewed ISO 11608-1:2022 regulations to establish test parameters of LyoTwist Ypsomed product
- Designed and produced small fixtures for product testing
- Assisted in lab equipment calibration, troubleshooting, maintenance, and qualification

Suarez Lab / CERN — Boston University, MA / Geneva, Switzerland.
Undergraduate Research Assistant January 2021 – March 2023
Fabricated electrical and mechanical connections between readout board, power board, and service module for the Endcap Timing Layer upgrade to CERN's Large Hadron Collider (LHC):

- Simulated and tested CAD files of readout board prototype in SolidWorks
- Built bias and low voltage connectors for printed circuit boards (PCB) in KiCAD and SolidWorks
- Performed mechanical and electrical testing protocols for all PCBs and connectors

Tested electronic module designs of Muon Endcap Chamber 0 Segment Finder (ME0SF) algorithm intended for Compact Muon Solenoid ME0 detectors for CERN's Large Hadron Collider:

- Wrote and executed test benches for module designs in Cocotb
- Developed pseudo-input generators for modules and emulators in Python
- Constructed ME0SF linear regression centroid finding firmware
- Debugged firmware blocks for ME0SF designs in VHDL

Projects

Synthera Health Microneedle Array September 2022 – Present

- Cultivate microneedle array (MNA) kit capable of drawing enough blood for iron deficiency testing while minimally perturbing pain receptors
- Conduct literature review of MNA size, orientation, and biocompatible material use
- Create CAD files of microneedle arrays in SolidWorks for mechanical simulation testing and rapid prototyping
- Assemble set up for in vitro assessment of MNA blood draw

REN*UV*: UVC Light-Based System for Medical Equipment Sterilization December 2022

- Produced a functional prototype of a UV-C light sterilization system using a hand crank, gearing, and a motor for a renewable energy source
- Defined design metrics and specifications from market research on industrial grade autoclaves
- Composed and implemented SolidWorks assembly of housing with electrical and mechanical components
- Assessed project performance using Pugh Analysis and FMEA

ZIXIN GUAN

guanzx@bu.edu • 415-919-8344 • Boston, MA • linkedin.com/in/guanzx

EDUCATION

Boston University College of Engineering — Boston, MA
B.S. in Biomedical Engineering — May 2023
San Jose State University — San Jose, CA
B.S. in Biomedical Engineering — Sep 2018 - May 2020

EXPERIENCE

Boston University School of Medicine — Boston, MA
Laboratory Assistant — Aug 2022 - Present

- Developed and implemented procedures for optimizing vascular smooth muscle(VSM) cell culturing methods to fabricate smooth muscle cell rings.
- Examined cell culture expression by western blot for targeted protein markers and tested different cell media for outstanding growing impacts.
- Determined strain conditions by mechanical and pharmaceutical methods to closely mimic normotensive and hypertensive settings and optimized stretching protocols to obtain the best morphology of VSM cells.

San Jose State University — San Jose, CA
Laboratory Assistant — Sep 2019 -Dec 2022

- Participated in nuclear targetry projects, specifically for production and characterization of thin films via energy-loss calculations.
- Constructed and tested custom instrument components within 6 months via CAD. Experienced with SolidWorks, OnShape, Etc.
- Collaborated in group meetings, presentations, and discussions with team members on academic papers and recent ongoing projects using Microsoft software.

Lawrence Livermore National Lab — Livermore, CA
Nuclear Science Intern — Jun 2022- Aug 2022

- Demonstrated Geant4 tool using a 3D scanner to create CAD mesh files to scan irregular-shaped demonstration objects and simulate detector responses.
- Utilized high-purity germanium (HPGe) detector for gamma spectrometry to analyze 3 sets of data utilizing interpretations from simulation.
- Compared data from unknown materials to known activity of irregular test items to verify accuracy of system libraries; resulted in 90% accuracy using CAD simulation method.

Esurgi, Inc — Timonium, MD
Product Manager Intern — Aug 2021 - Mar 2022

- Collaborated with valuation and strategy teams to create market and competitive assessments using market size research of pressure biofeedback units.
- Planned meetings for engineering and valuation teams upon availability, arranged qualitative interviews with physical therapists, and initiated pilot site studies with communication.
- Communicated and collaborated with leads, marketing, and engineering team to design and test prototypes of biofeedback unit modifications while producing product pitch decks along development process.

2019 & 2020 Bay Area Biomedical Device Conference — Bay Area, CA
Volunteer — Sep 2019 - Mar 2020

- Facilitated registration process and built strong relationships with guests by fulfilling their needs.
- Organized department meetings, and delivered guidance, introduction, and explanation for a 300+ guests event.
- Encouraged other members to interact with panel speakers and guests and coordinated with other members to ensure conference ran smoothly.

Benedek Gyuris

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Education

Boston University | GPA: 3.16 — Boston, MA
Bachelor of Science in Biomedical Engineering — Expected May 2022

Skills

Technical – SolidWorks, COMSOL, MATLAB, Multisim, Arduino, CAD/CAM
Laboratory – micropipette, mammalian cancer cell culture, fluorescent microscopy, confocal microscopy, cryostat
Language – English(Native), Hungarian(Native), Spanish(Proficient)

Projects

Cancer Drug Development Additive Manufacturing Project | DRAPER — October 2022 - May 2023
- Optimized previous design by increasing throughput by 400%.
- Developed a novel tumor loading procedure for the testing of simultaneous tumor models.
- Performed biological validation of the device using a mammalian carcinoma cell line.

MINDS Scholar Program | BMES — October 2022 - May 2023
- Designed an accessory for wheelchair cushions which allows for automated adjustments for the patient.
- Developed the control system of the device to ensure timely pressure relief.

Cellink Bio X 3D Printer Technical Review | Biomedical Measurements II — March 2022 - May 2022
- Synthesized alginate-based bio inks at different concentrations to demonstrate printability of different bio inks.
- Compiled a comprehensive presentation about the capabilities of the bioprinter.

Mandible Design | Anatomy and Physiology I — October 2019 - December 2019
- Collaborated in group of two to design a mandible to 1/3 human size using SolidWorks which was 3D printed using MakerBot Z18.
- Researched dimensions and applied to the design once each measurement was scaled down to 1/3 scale.

Soft Endoscope | Introduction to Engineering Design — January 2019 - April 2019
- Designed and built a prototype for a soft endoscope which utilizes air pressure to make the procedure safer and more comfortable for the patient.
- Soldered and programmed a motor to an Arduino to assist with the inflation and deflation of the prototype.

Experience

Construction Project — Wellesley, MA
Landscaping Planner — May 2022 - August 2022
- Researched methods for the development of drainage systems and hired five employees to assist with landscaping 15-25 hours a week.
- Utilized administrative skills by budgeting, recording receipts and planning out day to day activity.

Semmelweis University — Budapest, Hungary
Lab Assistant — April 2019 - August 2019
- Dissected chicken embryos and isolated the lower GI tract to map the movement of stem cells during embryo development.
- Set and froze samples in gelatin formula to create cross-sectional slides using cryostat.
- Applied fluorescent dyes to cell sections to image connective tissue, smooth muscle, and neural crest stem cells using fluorescent microscopy techniques.

Activities and Leadership Experience

Phi Sigma Pi National Honors Fraternity
Alumni Committee Head — November 2019 - May 2020
- Kept record of alumni contacts and co-op resources for members.
- Budgeted and planned an alumni banquet for 45+ attendees at a local venue.

Vaibhavi M. Hansrajani

vhansraj@bu.edu • +1 (857) 544-8122 • www.linkedin.com/in/vaibhavi-hansrajani-1009 Boston, MA, 02215

EDUCATION:

Boston University, Boston, MA. *Expected May 2023*
Bachelor of Science in Biomedical Engineering | Concentration: Nanotechnology and Machine Learning.
GPA: 3.43 | Dean's List
Relevant Coursework: Computational Genomics, Diagnostic designs, Bioengineering, Software Engineering, Data Analysis, Fluid Mechanics, Signals, Human Brain Mapping, Fabrication Technology for Integrated Circuits.

SKILLS:

Software: MATLAB, C, C++, C#, Python, Arduino, Java, Onshape, Solid Works, Microsoft Office Suite, Macintosh.
Laboratory: DNA Extraction, fluorescence microscopy, ELISA, RT-PCR, qPCR, chromatography, spectroscopy, bioprinting, western blotting, next-gen sequencing, AC amplifier circuits, capacitors, statistics and data analysis.

PROFESSIONAL EXPERIENCE:

Boston Medical Center Boston, MA
Engineering Research Assistant *June 2022 - May 2023*
• Applying Machine Learning tools on MATLAB, working on creating a real-time glomerular filtration rate (GFR) calculator to predict kidney function in patients with kidney disease. Current clinical methods are not quite accurate.
• Modeling the function of an artificial kidney to determine the best treatment of dialysis that can be provided to a patient.
• Analyzing urea clearance rate, and content of sodium, potassium and urea in plasma in Continuous Venovenous Hemofiltration, Continuous Venovenous Hemodialysis, and Continuous Venovenous Hemodiafiltration.

Worcester Polytechnic Institute Worcester, MA
Summer Intern *June 2021 - July 2021*
• Designed a battery-powered phototherapy lamp prototype for low income countries to treat infant jaundice at home.
• Incorporated the use of AutoCAD and stood in the top 5 among 40 teams.

Olive Healthcare Limited Mumbai, India
Summer Intern *June 2018 - July 2018*
• Examined the large-scale production of soft gel to produce high-quality capsules and conducted quality checks.
• Managed world-wide shipping of drugs and analysed existing literature to improve production costs.

PROJECT EXPERIENCE:

Titania Nanorods: DePuy Synthes, Orthopaedics Company of Johnson & Johnson *September 2022 - May 2023*
• Revising biomedical implants to reduce rate of infections through nanotechnology applications.

Dialyshield: Device to reduce Infection Rate during Dialysis *January 2022 - May 2022*
• 3D printed an equipment using polylactic acid that shields the high-risk zone located at the connection point of the catheter and the port to prevent breaches in sterility during dialysis with catheters.
• Simplified and generalized product for use in different catheters and minimized need for repeated sanitization.

Pac Man 2.0 *October 2021 - December 2021*
• Modified the original PacMan game in C++ and programmed it to be played between 4 users (3 ghosts, 1 PacMan).
• Enhanced Pac Man's abilities by introducing extra powerups and secret exit channels.

Pulse Oximeter: Engineering Design Project *August 2020 - December 2020*
• Engineered a pulse oximeter to help hospitals triage patients and face the coronavirus pandemic.
• Created a working model employing the use of both a Maxim Integrated RD117 Sensor and OPT101 chip.
• Prepared portable packaging to improve efficiency using AutoCAD and 3D Printers.

SELECT EXPERIENCE:

Boston University Tele fund Supervisor, Boston, MA *January 2020 - May 2023*
• Supervise callers and solicit support for the university. Manage fundraisers, monthly budgets and program efficiency.

Boston University Information Technology and Services Support Specialist, Boston, MA *August 2020 - August 2021*
• Tackled technical issues arising in classrooms with the online synchronous learning format.
• Troubleshooted issues arising with Microsoft Windows, Macintosh, Zoom, Blackboard, Canvas and others.

LEADERSHIP:

Secretary for Boston University Competitive Robotics. *April 2020 - May 2023*
Society of Women Engineers (SWE) and Biomedical Engineering Society (BMES). *October 2019 - May 2023*
International Students' Program Director and **Dean's Host**. *September 2021 - October 2022*
Boston University Physics Department Teaching Assistant. *September 2020 - October 2021*

Emma Hartman

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EDUCATION

Boston University, College of Engineering **Boston, MA**

Bachelor of Science in Biomedical Engineering, Machine Learning Concentration; Biology Minor; Pre-medical track

Exp. May 2023

- Relevant Coursework: Kilachand Honors College, Human Brain Mapping, Statistics/Data Science, Systems Phys.
- Awards: Tau Beta Pi, Dean's List, Distinguished Summer Research Fellow (2021), Cardinal Medeiros Scholarship

RELEVANT EXPERIENCE AND PROJECTS

Department of Neurosurgery at Tufts Medical Center **Boston, MA**

Research Assistant January 2023 – present

- Applying machine learning techniques to patient databases to identify factors that influence patient health outcomes during spinal neurosurgical procedures

Economo Lab at Boston University **Boston, MA**

Research Assistant September 2021 – present

- Model mouse electrophysiology neural and video data with MATLAB software
- Quantitatively compare mouse neural and kinematic activity trends in primary motor cortex and anterolateral motor cortex data for different behavioral contexts

Quantum Diamond Technologies Inc. **Acton, MA**

Intern June 2022 – August 2022

- Optimized sensitivity of proprietary assays to neuroinflammation biomarkers for usage in clinical blood testing
- Investigated effects of buffers, reagent titrations, and production protocol on assay sensitivity

Economo Lab at Boston University **Boston, MA**

Distinguished Summer Research Fellow June 2021 – August 2021

- Investigated the cause of motor-related oscillatory neural patterns in the primary motor cortex
- Trained 3 mice on a sensory-guided decision-making task
- Obtained motor cortex and somatosensory neural data using electrophysiology and optogenetic silencing techniques
- Processed and spike sorted mouse neural data

Economo Lab at Boston University **Boston, MA**

Research Assistant January 2020 – May 2021

- Trained optogenetic mice and implemented an experimental paradigm for electrophysiology recordings of mouse neural data from anterolateral motor cortex under the supervision of a PhD student
- Processed and evaluated behavioral data from electrophysiology recording sessions using MATLAB software

SKILLS

Computational: MATLAB (signal processing, statistics and machine learning toolboxes), Python, R, Spike Sorting, video data processing

Laboratory: Mouse care (training, administering medications, assisting in neurosurgical procedures) and behavioral training, electrophysiology, histology, pipetting, gel electrophoresis, PCR, titrations

LEADERSHIP AND INVOLVEMENT

Tau Beta Pi Honor Society, Boston University Chapter **Boston, MA**

President April 2022 – present

- Collaborate with five-person executive board and national organization to host professional development events
- Successfully petitioned Boston University College of Engineering to subsidize 50% of new member fees to lower socioeconomic barriers to joining

Girls Who Code, Boston University Chapter **Boston, MA**

President January 2021 – January 2023

- Supervise the activities of a nine-person executive board and delegate event planning tasks
- Correspond with companies to propose and plan guest speaker series and coding workshops
- Oversee eight club events per semester for 50 general members, an 85-person inter-club Women in STEM Mentorship Program, and the Boston University Girls Who Code Bits and Bytes youth clubs

Isha S. Havale

isha.havale@gmail.com ● (617)-775-4510 ● www.linkedin.com/in/isha-havale ● Sharon, MA

Education

Boston University, College of Engineering Boston, MA

B.S. in Biomedical Engineering, Minor in Chemistry, Concentration in Nanotechnology Exp. Dec 2023

Relevant Coursework: Molecular Bioengineering I, Clinical Applications of Biomedical Design, Intro to Nanotechnology, Introduction to Solid Biomechanics, Thermodynamics and Statistical Mechanics, Systems Physiology, Organic Chemistry, Device Diagnostics and Design

Projects

Multiomic Data Analysis Pathway for C4 Therapeutics, Senior Design Project

- Design, build, and implement comparative data analysis pathway for proteomics and transcriptomics data for C4 Therapeutics using R in order to gain insights from integrating multiomic data and make the data analysis more accessible and automatic for biologists

Traction Force Study, Smith Lab and Layne Lab, Boston University

- Outlined and presented research proposal for conducting traction force microscopy, utilizing previous knowledge of cell culture techniques and MATLAB image analysis, to better understand the effect of ACLP on cell tension and forces

Pulse Oximeter, Engineering Design Project

- Designed and built a prototype of a pulse oximeter utilizing Arduino, a Maxim Integrated RD117 Sensor and a OPT101 chip, in order to help hospitals triage patients during the Coronavirus pandemic

Drug Delivery, Introduction to Engineering: Drug Delivery

- Analyzed and demonstrated effectiveness of different drug delivery systems for Cortisol using Stella Architect, in order to test which drug delivery system in best under different conditions, as well as become familiar with modeling in Stella Architect

Relevant Experience

Student Tech Consultant, Questrom School of Business, IT Department May 2022 - Present

- Consult with professors and transfer class content from Questrom Tools to Blackboard Ultra
- Assist professors and students with troubleshooting technical issues with Blackboard, Zoom, Microsoft Windows, and others
- Lead student and faculty workshops for various skills such as R, Python, Tableau, Excel, and others

Undergraduate Researcher, Layne Lab, Boston University Medical Campus May 2021 - Jan 2022

- Prepared and conducted research plans for a self-directed study of the mechanisms of Aortic Carboxypeptidase-like Protein (ACLP) control of ECM mechanics utilizing cell culture techniques, Western Blotting, and Immunofluorescence staining and imaging
- Prepared, manipulated, imaged, analyzed, and presented cell sample data using Fiji and MATLAB software to compare and study differences in ECM between study conditions

Skills

Laboratory: Cell Culture, Western Blotting, Immunofluorescence staining and imaging, creating polyacrylamide gels of varying stiffness

Computer: MATLAB, C, Fiji, Image Lab, LabScribe, Stella Architect, Python, R, Excel, Arduino, Java

Languages: English (native), Marathi (native), Hindi (fluent), Spanish (conversational)

ZIXIAN HE

1110 Commonwealth Avenue, Boston, MA, 02215, USA
Email: ethanhezixian@outlook.com • **Phone**: 857-204-3980

EDUCATION

BOSTON UNIVERSITY, Boston, MA September 2019 - May 2023
BS, Biomedical Engineering (expected 5/2023)

- **GPA:** 3.22/4.0

RESEARCH EXPERIENCE

Boston University, Boston, MA August 2022 - May 2023
Human systems neuroscience LAB
Laboratory Researcher

- Operated MATLAB to simulate Thalamic reticular nucleus (TRN) self-organizing recurrent neuron network
- Cooperated with team member and research on neuron activities
- Founded recurrent neuron network between Thalamic reticular nucleus (TRN) and thalamocortical (TC) neurons and display connection between different neuron function area

Boston University, Boston, MA 9/2022 to present
Senior Design

- Generated a specific laparoscopy sleeve to provide health provider form pathogen aspiration
- Cooperate with team member to make design and interview stakeholder

Xiang Ya Hospital, Central South University, Changsha, China 5/2022 to present
Laboratory Researcher

- Generated research procedures on sepsis associated epilepsy; Operated MATLAB to analyze data from mimic database
- Researched MATLAB to program deep neural network to analyze and compare different data; detected network multiple times to ensure accuracy
- Partnered with PI to write scientific paper; provided mathematical models and data plots

Boston University, Boston, MA 3/2022 to present
Computational neuroscience and Visual LAB
Laboratory Researcher

- Programmed general pattern form based on mathematical formula and scientific thesis to simulate connection between different brain regions
- Develop MATLAB to imitate multiple neuron cells in different conditions; recorded and plotted analytical output
- Operated image processing research projects to improve current lab procedures and MATLAB codes

Harvard University, Cambridge, MA 6/2022 to 9/2022
Bio-electronic and novel brain-machine interface LAB
Laboratory Assistant

- Participated in bio-electrical science projects; responsible for the EEG, fMRI data collections and analysis in programming code related to synaptic current and imitated membrane potential
- Researched rats' behavior readout and used software to track body part positions

Robert I. Henderson

Ianhen98@bu.edu | 315.857.8014 | https://www.linkedin.com/in/ianhenderson-05a992203/ | Boston, MA 02134

Education

Boston University — Boston, MA
Bachelor of Science | *Biomedical Engineering* — Expected May 2023

Christian Brothers Academy — Syracuse, NY
National Honor Society | National AP Scholar — April 2019
ACT: 32/36 | *Math SAT: 720/800*

Work Experience

Product Risk Management Intern — Portsmouth, New Hampshire
Novocure — June 2022 – September 2022

- Evaluated R&D process improvement initiatives.
- Updated risk management process and several risk management documents in MS Office programs.
- Revised and refined Verification and Validation test methods.
-

Biotechnology Inventory Specialist Intern — Boston, Massachusetts
Cambridge Scientific Products — May 2021 – August 2021

- Organized lab equipment in showroom and warehouse.
- Compiled and inputted information into Airtable database.
- Conducted organization of warehouse by aiding biological technicians with equipment.
- Managed light deliveries and pickups from other biotech companies.
- Compiled budget reports, financial spreadsheets, and organizational charts to support business operations and improve office organization.

Projects

Senior Capstone Research and Design Project — Boston University
Biomedical Engineering Senior Project — August 2022 – May 2023

- Collaborated with 4 seniors to investigate manufacturing processes of a nanoscale coating on titanium substrate.
- Engineered experimentation and learned SEM imaging techniques to analyze nanostructures.
- Granted opportunity to assess finalized nano surface for adhesion characteristics.

Sleep Apnea Diagnostic Test — Boston University
Intro to Engineering Design — Fall 2022

- Examined pain points of current sleep apnea tests through meetings with sleep apnea patients and sleep specialists.
- Initiated assembly with a group of 4 of a looks-like prototyped of a comfortable and simplistic sleep apnea test with Autodesk.
- Developed a works-like prototype with Arduino to monitor heart readings and breathing patterns.

Pulse Oximeter — Boston University
Intro to Engineering Design — Fall 2020

- Assembled a pulse oximeter prototype to measure Covid-19 patients' blood oxygen levels and pulse utilizing an Arduino and Arduino IDE software.
- Coordinated design of a noninvasive, portable, and accurate model to meet OSHA safety requirements and would give precise readings instantly.
- Produced schematics of wiring necessary to incorporate LEDs and photodetectors to visualize oxygen content as it passes through finger of subject.

Skills & Extracurriculars

Technical: MATLAB, Python, MS Office, Autodesk. Device Design, Quality Engineering, Computational Modeling, Arduino, Biomaterials, Nanomaterials, Biotechnology Sales
Extracurriculars: Hockey (Three-year Varsity Starter), Lacrosse (Two-time Sectional Champion and State Champion), Snowboarding, Golf

Katie Hill

khill23@bu.edu 781.561.6965 www.linkedin.com/in/katie-hill-09a3b3242/ Boston, MA

EDUCATION

Boston University **Boston, MA**
School of Engineering Sept. 2019 - May 2023
Biomedical Engineering - Technology Innovation Concentration

Tabor Academy **Marion, MA**
High School *2016-2017*

Duxbury High School **Duxbury, MA**
High School Diploma *June 2019*

PROFESSIONAL EXPERIENCE

Beth Israel Deaconess Medical Center
Boston, MA *Orthopedic Surgery Research Assistant*
September 2022 - Present

- Designed innovate solutions for patients with irreparable torn rotator cuffs
- Non-Disclosure Agreement Engineering Project

Boston Scientific **Marlborough, MA**
Endoscopy Research & Development Intern *May 2022 - August 2022*

- Completed a twelve week Internship with the Single Use Imaging Endoscopy Department
- Filed three IP's with Boston Scientific
- Field Ride experience with Boston Scientific Sales Representative
- Structured brainstorming events regarding the constructive criticisms from physicians

Boston Children's Hospital **Boston, MA**
Cardiology Research Intern *June 2021 - August 2021*

- Nine week Internship for the Georgia Clare Bowen Foundation
- Point Of Care Ultrasound(POCUS) Study with the Butterfly® Probe
- Tested the usability of the device to see if non-health care workers could use a POCUS Device and send readable echocardiograms back to the hospital.
- Composed invitation to Boston Children's Hospital (BCH) patients with heart conditions asking for their participation in the at home UltraSound study
- Aided in the composition of the Butterfly Point of Care UltraSound Study SRC Proposals and Research Consent Forms
- Researched for the BCH Apixaban research study

Dental Career Exploration **Duxbury, MA**
Dentist and Orthodontist Shadow Experience *Summer 2018*

- Shadowed a local orthodontist and a local dentist. Observed the removal braces, fix root canals, and put bonding patients teeth

EXTRA CURRICULARS

BU Innovation Pathway Program **Boston, MA**
Shop Swapp Co-Founder *September 2022 - Present*

- Program that supports BU students start-ups by providing entrepreneurial coaches and financial support
- Implemented on a student marketplace platform to connect students to sell and buy pre-loved items and promote sustainability on campus

Alpha Phi Sorority **Boston, MA**
Active Chapter and Philanthropy Member *February 2020 - Present*

- American Heart Association Fundraising Events: Ivy Man, Red Dress Brunch
- Attending other chapters' philanthropy events throughout the academic year

Society of Women Engineers
Boston, MA
Active Member *January 2022 - December 2022*

Patra T Hsu

patra@bu.edu • 412-418-1870 • linkedin.com/in/patra-hsu
*Possess Current DoD security clearance, details available upon request

Education

Boston University | GPA: 3.56 | *Boston, Massachusetts* **Expected May 2023**
B.S. in Biomedical Engineering, Minor in Systems Engineering Dean's List: Spring 2022, Fall 2023

Work Experience

Systems Engineering Intern | Vicarious Surgical 01/23 – present

- Calculate robotic instrument workspace and create system requirements and architecture from it.
- Streamline traceability between user needs, system, and subsystem requirements via Excel macros.
- Collaborate with clinical, integration, and V&V to identify test methods and requirement values.

Research Assistant | Material Robotics Laboratory at BU 09/21 – present

- Assist research with a Pneumatic Haptic Glove project by using soft robotics and textile actuators to design a glove that improves sensor feedback in minimally invasive surgical procedures.
- Fabricated soft tactile actuators and collected and processed in-vitro data from soft robotic sensors that led to co-authoring of 3 publications.

Systems Engineering Intern | Collins Aerospace: Mission Systems: SS&S 05/22 – 12/22

- Executed a literary review for a Virtual Reality simulation implementation whitepaper.
- Tested PC maintenance simulator scenario systems for critical simulation faults.
- Led an effort to integrate Cognitive Assessment Tool Set into a simulator framework to provide a measure of training effectiveness to improve pilot training through assessing cognitive workload.

Teaching Assistant | Introduction to Engineering Design 09/21 – 05/22

- Guided +30 students per semester through CAD, engineering design process, microcontrollers, and manufacturing to devise working prototypes for clients in semester-long projects; graded assignments.

Projects

Cancer Immunotherapy Additive Manufacturing Platform | DRAPER 09/22 – 05/23

- Developed and optimized a 3-D printed microfluidic device for cancer immunotherapy applications in a year-long senior design project under industry advisership in a group of 2.

NoodleBot | Introduction to Robotics and Autonomous Systems 09/22 – 12/22

- Developed a noodle-cooking robot concept with a depth camera and a robotic arm to identify and cook pasta types to mitigate restaurant industry labor shortage.
- Validated computer vision with YOLOv4 and Faster RCNN machine-learning algorithms.

Peripheral Neuropathy Project | Biomedical Device Diagnostics and Design 01/22 – 05/22

- Researched and built a prototype sock utilizing electrodes, red LEDs, and heat therapy to alleviate pain and discomfort in patients with peripheral neuropathy in feet in a group of 6.

Leadership

Public Relations Chair | Society of Women Engineers: BU section 03/20 – 05/23

- Rebranded social media presence and initiated new partnerships with local companies.
- Ran wide-reaching social media campaigns to led to increased membership by 300% in 3 years.

Marketing Co-Chair | Boston University Engineering Student Government 09/20 – 04/21

- Marketed to ~2000 students; assisted annual Engineering Week events; managed social accounts.

Applicable Skills

Hard Skills: Engineering Design, MATLAB, C, Arduino, Soft Robotics, Pneumatic Haptic Systems, SolidWorks, Jama, Jira, Requirement Creation and Traceability, R, Machine Learning (Python)
Soft Skills: Communication, Project Management, Adaptability

RONALD HUANG

Boston, MA 02134 | (510)331-6530 | rhuang@bu.edu | github.com/ronaldxhuang

EDUCATION

Boston University – College of Engineering **Expected May 2023**
Bachelor of Science in Biomedical Engineering *Boston, MA*

TECHNICAL SKILLS

Computer Vision, Deep Learning, OpenCV, C/C++, Python, MATLAB, JavaScript, Linux/Ubuntu,

WORK EXPERIENCE

Undergraduate Research Assistant **Summer 2022 – Present**
Chandrasekaran Laboratory *Boston, MA*

- Programmed computer vision detections methods such as floodfill, blob, and contour detection to track pupil data and identify corneal reflection
- Implemented the ability to save eye tracking data for post-hoc analysis
- Ported the openEyeTrack implementation to the Qt GUI

Undergraduate Research Assistant **Spring 2022 – Fall 2022**
Lewis Laboratory *Boston, MA*

- Investigated the effects of long eye lid closures in subcortical regions of the brain
- Worked alongside lead researchers in data collection for sleep deprivation and behavioral state research
- Fixed OpenCV implementation issues in the open-source program openEyeTrack
- Utilized different detection algorithms to achieve the best result for pupil detection and eye tracking
- Developed UDP networking implementations for computer vision data saving purposes

Biomedical Imaging Intern **Summer 2021**
Massachusetts General Hospital – Martino's Center for Biomedical Imaging *Boston, MA*

- Performed Optical Coherence Tomography (OCT) imaging experiments on mice brain to study the effects of SCA1 on brain structure
- Created 2-D stitches of cross-sectional images in a Linux environment using MATLAB
- Trained data sets using basic deep learning techniques to distinguish healthy and infected mice

PROJECT EXPERIENCE

Intuitive Computer Human Interfacing **Fall 2022 – Present**
Senior Design Project

- Used OpenCV libraries in C++ to detect the Tobii eye tracking cursor
- Implemented the interface between the Tobii Eye Tracker and a Windows desktop application using the Google Speech-to-Text API

Medical Device Design: Neuropathy Treatment **Spring 2022**
Device Diagnostics and Design Project

- Worked with a team to design and prototype a device to relieve pain from Peripheral Neuropathy
- Leveraged C++ to implement Bluetooth features via an Android mobile device using the HC-05 wireless RF transceiver and the Arduino Nano microcontroller

LEADERSHIP AND ACTIVITIES

Theta Tau Psi Delta, *Professional Engineering Fraternity* **Spring 2020 – Present**
Positions: Fundraising Chair, Brotherhood Chair *Boston, MA*

RELEVANT COURSEWORK

Deep Learning for Biomedical Imaging, Intro to Software Engineering, Biomedical Signals and Controls, Biomedical Measurements, Thermodynamics and Statistical Mechanics, Device Diagnostic and Design, Data Science for Engineers, Electric Circuits

Daniel Jiang

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Skills:

Critical Thinking
Teamwork and Collaboration
Self-Motivated
Collaboration
Conflict Resolution
Dependable and Responsible
Analytical and Critical Thinking
Attention to Detail
Problem-Solving

Objective:

Organized and dependable candidate seeking a position that leverages my skills in critical thinking, teamwork, problem-solving, and data analysis. I am eager to contribute to team goals, take on added responsibilities, and apply my strong foundation in mathematics, programming, and science to solve complex problems.

Research Experience:

Research Assistant, [March 2022 - Present]
Boston University's Ultrafast Optic Laboratory - Boston, MA

Working on the Characterization of Light-induced Temperature Transients during Infrared Neuromodulation project. Conducting data analysis and applying probability and statistics knowledge to solve issues encountered during the research.

Utilizing MATLAB programming to model and analyze experimental results.

Collaborating with a multidisciplinary team of researchers to achieve project objectives.

BME Senior Design Project:

Working on developing a motorized lickport system to assist researchers during their neural recording sessions for mice.

Education:

[Boston University]
Bachelor of Science in [Biomedical Engineering] - [2023 Spring]

SHOUHAO JIANG

shsjiang@bu.edu • 617-838-7378 • Boston, MA • linkedin.com/in/shouhaojiang

EDUCATION:

Boston University College of Engineering: Boston, MA

B.S. in Biomedical Engineering, GPA: 3.14/4.00 May 2023

Relevant Coursework:

- Engineering Design | Physics | Mechanical Design
- Molecular Cell Biology | Biotechnology & lab | General Chemistry & lab
- Computational programming (MATLAB) | Introduction to Data Science
- Electric circuit analysis and design & lab

PROJECTS:

Matlab Final Project

- Conducted research on databases by using MATLAB , infused data into consistent spreadsheet form and a comprehensive population output
- Lead with a team of three and combine all parts of the project together
- Presented and showed analysis of international student population to class

Share Bicycle Marketing Analysis Project

- Market investigation and research with data analysis
- Collaborate in NYU Stern professor to establish the inquiry with data analysis in certain geographical areas in China

EXPERIENCE:

Zizhu Pharmaceutical co. ltd Beijing, China

Business development intern Season 2023

- Built knowledge of Pharmaceutical market and management
- Communicated with colleagues and take care of pharmaceutical air conditioner after-sales service
- Innovated new approach for A.I. online meeting

Osteoarthritis Research Boston, MA

Undergraduate Research at Albro's Lab Season 2022

- Operated indentation for human cartilage
- Used Raman Spectroscopy to detect water content in human cartilage
- Cooperated with team members for GAG Assay and Proteinase K Digestion

IDEAS Boston, MA

Scientific educational mentor intern Season 2021

- Taught kids scientific knowledge in electronic and biology area
- Collaborated with other mentors with electronic and chemistry labs
- Led group and individual meeting with kids and professors

LEADERSHIP:

Boston University Chinese Students and Scholars Association, Member present - Season 2020

TESSA JOHNSON

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EDUCATION

BOSTON UNIVERSITY | COLLEGE OF ENGINEERING — Boston MA
Masters of Engineering in Biomedical Engineering, Concentration in Biomechanics — May 2024
Bachelor of Science in Biomedical Engineering, Concentration in Technology Innovation — May 2023

- Overall GPA: 3.82/4.00, Magna Cum Laude
- Activities: Club Rugby, Student Government Representative

WORK EXPERIENCE

MORPHABLE BIOROBOTICS LAB — Boston, MA
Research Assistant — March 2022 – Present

- Developed endoscope bracing technology to optimize surgical tool control and ease during minimally invasive surgery, by designing with AutoCAD, SOLIDWORKS, and concept sketching
- Manufactured 15+ surgical bracing prototypes using C02 lasers, silicone molding, and soft robotics
- Research and development team member for soft robotic hand device for stroke patient rehabilitation

GEORGE HOWELL COFFEE COMPANY — Boston, MA
Barista, Customer Service — March 2022 – Present

- Trained and lead a 10-person team in customer service techniques, daily tasks, and workflow efficiency
- Executed fast communication, preparation, and delivery of 50+ beverages per hour to customers
- Competed, attended, and taught at 10+ coffee competitions, expositions, and monthly classes

49ERS FIT — San Jose, CA
Operations Team, Personal Training — June 2021 – January 2022

- Utilized technical and communication skills to sell, operate, and manage cryotherapy equipment
- Trained and lead 20+ colleagues how to teach and correct athletic equipment use to their clients
- Improved customer experience by resolving customer questions, complaints, and concerns

FREELANCE ACADEMIC TUTOR — San Jose, CA
Tutor — September 2017 – January 2021

- Promoted critical thinking for long-term academic success by teaching mathematics, writing, science, and organizational skills to improve students' exam scores in mathematics by 3 letter grades on average

PROJECTS

SOFT ROBOTIC GLOVE FOR HAND REHABILITATION — September 2022 – May 2023

- Created and exhibited a soft robotic device for stroke patient hand strength rehabilitation
- Designed scaffolded 30+ magnetorheological fluid packets, electro-permanent magnet circuit systems, and integrated glove structures using the Instron, heat press, spin coater, and sewing machines
- Constructed financial models and concept sketches with Procreate and Illustrator, and presented progress reports to panels of BU Morphable Biorobotics Lab members, advisors, and professors

UV STERILIZATION DEVICE FOR REFUGEE CAMPS — September 2022 – December 2022

- Elected team leader for low resource sterilization device with UVC light and crank-powered circuitry
- Drafted and tested 5+ conceptual models and 3+ physical prototypes of various glove components using SOLIDWORKS, Procreate, MATLAB, bacterial culturing, 3D printing, machining, and Excel
- Conducted interviews and customer research to establish design ideas, stakeholders, and marketability

HEART PROJECT BRACING DEVICE — March 2022 – August 2022

- Modeled and presented 15+ pop-up bracing mechanisms for a minimally invasive cardiovascular surgical system with MATLAB, concept sketching, AutoCAD, SOLIDWORKS, Illustrator, and PowerPoint
- Utilized feedback from clinical trials at Boston Children's Hospital with cardiovascular surgeons and biomedical engineers to alter designs and prototypes

Aniket Joshi

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Education

Boston University College of Engineering, Boston, MA May 2023
Bachelor of Science in Biomedical Engineering, Minor in Electrical Engineering
Dean's List Fall 2021, Spring 2022
Coursework to date: Computational Linear Algebra, Organic Chemistry, Biochemistry, Systems Physiology, Signals Systems and Controls, DSP, Mechanics, Circuits, Discrete Math, Probability and Statistics, Fluid Mechanics
Organizations: Terrier Motorsport, Aerodynamics Sub Team

Work Experience

Coalesenz Inc, Boston, MA January 2023 - Present
Software Engineering Intern
- Built user interface using Qt for alpha prototype resulting in functional device prototype
- Developed code for camera and laser system in Yocto Kirkstone linux allowing for faster image capture
- Implemented PID based laser temperature control system with status screen to enhance optimization of laser performance

Boston University Mars Rover Club, Boston, MA August 2020 - Present
Autonomous Navigation Developer
- Oversaw team of developers to design and build a SLAM based autonomous navigation system
- Implemented stereo vision based mapping algorithm and IMU based localization, accelerating design and testing of final autonomous navigation system
- Coordinated with vision, path planning and hardware teams to standardize design and maintain full functionality of autonomous navigation system

Caritra, Boston, MA November 2019 - August 2020
Front End Web Developer
- Redesigned product style and UX resulting in major stylistic and functional changes
- Planned and developed strategy for android mobile application resulting in the use of the ionic development platform for a more responsive user interface

Curiosity Gym, Mumbai, India June 2018 - August 2018
Educational Content Developer
- Researched and developed educational courses in math, physics and computer science facilitating the deployment of 6 courses to schools in Mumbai
- Organized meetings with leadership and made critical decisions regarding the long term goals of the educational content team
- Managed development team, and executed on all planned goals, expanding the number of courses in computer science

Projects

Augmented Reality Video
- Communicated with the Federal Public Defender's Office to assess technical needs for federal court
- Implemented 3D body tracking AR model to meet case needs and deployed AR simulation on Lens Studio

Video Stabilization Algorithm
- Created a video stabilization algorithm using 2D signal processing techniques
- Calculated cross covariance of video frames and compared maximums to discern frame displacement to stabilize the video

Wearable EKG Monitor
- Completed conceptual design and prototyping of wearable EKG monitor for diagnosis of arrhythmias
- Placed as a finalist in the Boston University Biomedical Engineering Society Design Competition

Skills

Technical: MatLab, C++, Autonomous Navigation, CAD, Digital Processing, Qt Framework

Alexia Kaloudis

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EDUCATION

Boston University College of Engineering — Boston, Massachusetts
Bachelor of Science in Biomedical Engineering — May 2023
Cum Laude
Relevant Coursework: Introduction to Biomedical Materials Science; Transport Phenomena in Living Systems; Fundamentals of Biomaterials; Clinical Applications of Biomedical Design; Organic Chemistry I/II; Fundamentals of Fluid Mechanics; Thermodynamics and Statistical Mechanics; Biomedical Measurements I/II

SKILLS

Laboratory: NMR, HPLC, GPC, column chromatography, glove box operation, precipitation purification, DLS analysis, cell culturing, MTS assay
Computer: MATLAB, Java, Python
Language: English, Greek

HONORS & AWARDS

Undergraduate Research Opportunities Program, *Grant Recipient* — April 2022
Summer Term Alumni Research Scholars, *Grant Recipient* — April 2022

PROJECTS

Polymer-Drug Conjugation for Ultra-High Loading Nanoparticles — Nov 2021 - May 2023
Boston University Department of Biomedical Engineering
Principal Investigator: Mark W. Grinstaff

- Synthesized polymers and conjugate chemotherapy drugs to polymer side chains
- Fabricated nanoparticles from drug-conjugated polymers with additional encapsulated drug
- Controlled the degree of conjugation and encapsulation to study how nanoparticles achieve ultra-high drug loading

RELEVANT EXPERIENCE

Chemical Stockroom Assistant, *Boston University Department of Chemistry* — Boston, Massachusetts
- Organized materials, chemicals, and instruments for chemistry lab classes — Jan 2020 - Dec 2021
- Guided students and provided extra materials from the stockroom as they entered the lab spaces

Intern, *Worcester Polytechnic Institute Virtual Internship in Biomedical Engineering* — Worcester, Massachusetts
- Led a team to design a device to sterilize medical tools — Jun 2021 - Aug 2021
- Designed a sterilizer in CAD for tools utilized for childbirths in low-income countries
- Communicated design to a committee of professors and other interns

LEADERSHIP EXPERIENCE

Society of Women Engineers, *Vice President* — Sep 2019 - May 2023
- Co-led a team of 10 e-board members to coordinate funding, marketing, and networking events
- Planned, organized, and advertised events surrounding supporting other women in engineering
- Membership Chair May 2021 - May 2022; active organization member from Sept. 2019

Richaa Kalva

rskalva@gmail.com • (240) 893-4142 • https://www.linkedin.com/in/richaa-kalva-780b3958 • Boston, MA

EDUCATION Expected May 2023

Boston University -- School of Engineering, Dean's List
Biomedical Engineering (BE), Minor in Philosophy

SKILLS

Fusion 360, Prototyping, EPIC EHR, Autodesk Inventor, SOLIDWORKS, Onshape, Machining, Circuit Design, Smartsheet, Picoscope 6, Cell Culture, DNA Transfection, Flow Cytometry, Arduino, C/C+, MATLAB, Excel, Google/Microsoft Apps, SnapGene, SpectroFlo, CNC G-Code/Software (ShopBot/Roland), Adobe Suite

EXPERIENCE

Boston University Wong Lab *(Biomedical Engineer)* *Sep 2022 – May 2023*

- Research to develop an optogenetic toolkit leveraging light-inducible split recombinases in mammalian cells to construct functional light-responsive genetic switches with applications in regenerative medicine
- Supported development of synthetic cell-cell signaling, tissue patterning, and morphogenesis models
- Conducted DNA transfection and transduction, cell culture, light microscopy/imaging
- Created a multi chromatic spatial patterning illumination system with a team of diverse skillsets

Boston University Singh Imagineering Lab *(Lab Advisor/Technician)* *Sep 2021 – May 2023*

Guiding and advising peers to innovate in an entrepreneurial sense using lab tools and machinery such as computer numerical control mills, 3D printers, lathes, FormLabs and PRUSA technology, circuit schematic and practical design to pursue engineering ideas and designs.

PERIOD. @ Boston University *(President)* *Oct 2019 – May 2023*

- Helped open dialogue regarding reproductive health and period poverty in the Greater Boston Area by facilitating packing and distribution of menstrual products to women's homeless shelters
- Partnered with organizations such as MassNow to push related legislation: "I AM. Bill" and HD2246
- Collaborated with local council women to draft BU's "Reproductive Bill" addressing issues such as the Pink Tax and access to menstrual products
- Led discussions to raise awareness of issues such as female genital mutilation and endometriosis

OCHIN Epic *(Workflow Engineer)* *Jun - Oct 2022*

Coordinated with FQHCs and medical professionals to custom build EPIC EHR systems for diagnostics and point of care. Helped provide knowledge solutions working within EPIC, ELLA API, Smartsheet, and other software to design workflows for modules for procedures ranging from vaccinations/immunizations to cardiovascular.

The Creative Process Podcast *(Science + Policy Podcaster)* *Jun - Sep 2021*

Led bioethics and environmental sciences team as a podcaster/interviewer. Spoke with leading professionals in fields of environmental science and technology such as Craig Kauffman, to tackle issues of bioethics, environmental policy, and rights of nature. Mastered podcast and sound editing software Descript.

Akan Biosciences + FDA Map *(Lab Tech/Engineer + Intern)* *Jun - Oct 2020*

- Managed both lab/technical/administrative aspects of lipo aspirate stem cell therapy and SVF (stromal vascular fraction) harvesting to generate medical treatments for osteoarthritis
- Dealt with human samples using lab/medical technology, interpreted sterility reports, practiced GMP and GDP documentation standards, presented on operation of Muse cell analysis and flow cytometry software
- Optimized thermodynamic processes of lab blenders and related machinery for mechanical vs. enzymatic SVF isolation; devised ergonomic redesigns of lab processes for maximum efficiency

National Children's Hospital Department of Genetic Medicine *(Intern)* *Jul - Oct 2018*

Conducted research for Duchenne Muscular Dystrophy; mammalian cell sample retrieval, sample preparation and treatment, data imaging, data collection and analysis, presentation of studies with standardized technical writing. Featured in relevant publications regarding DMD. Supported Dr. Jaiswal and Dr. Mazala in data retrieval.

Prinjali Kalyan

prinjali@bu.edu • (609) 222-5737 • www.linkedin.com/in/prinjali-kalyan/

EDUCATION

Bachelor of Science in Biomedical Engineering, Boston University **May 2023**
Clinical Medical Assistant Certification Program, Merit Training Institute **Aug 2021**

RESEARCH

Research Assistant at the Zaman Laboratory, *Boston University* *May 2022 - Present*

- Analyzing effect of combination of metal ions and antibiotics effect on antimicrobial resistance in refugee communities of Cape Town, South Africa
- Performing MIC and FIC assays and analyzed using absorption microscopy to determine bacterial growth

Research Assistant at the Bioinformatics and Imaging Laboratory, *BUSM* *Jul 2020 - Oct 2021*

- Aided in design of machine learning method to process MRI scans and diagnose patients with dementia
- Streamlined and performed statistical data analysis to interpret results using MATLAB and Python
- Conducted comprehensive literature review to inform research approach and presented results

PROJECTS

Burst Pressure Tissue Adhesive Testing System, *Draper* *Sep 2022 - Present*

- Designing and prototyping a novel testing system to measure burst pressure of various tissue adhesives on blood vessels

Pulse Oximeter Project *Jan 2021 - May 2021*

- Collaborated with a team of four students to design, prototype, and build a pulse oximeter that can account for various skin colors

Kidney and Tumor Segmentation using U-Net Deep Learning Model *May 2020 - Aug 2020*

- Helped write abstract for paper aimed at modifying U-Net deep learning model for kidney tumor detection

WORK EXPERIENCE

Medical and Administrative Assistant *Jan 2022 - Present*

- Assisting in procedures such as colposcopy, cervical biopsy, contraception insertion/removal, and other specimen collections
- Obtaining vital signs such as blood pressure, pulse, and weight
- Facilitating patient registration and check-in, including oversight of electronic medical record and billing

Resident Assistant *Aug 2021 - Present*

- Managing 60 residents and assisting with medications and other conflicts, as well as organizing floor events
- Serving as first point of communication in emergency situations

Visual Database Intern *May 2020 - Aug 2020*

- Collaborated with a team of 3 to create a database combining all research of undergraduate research
- Consulted with other research teams and presented to an entire program of 150 interns

VOLUNTEER EXPERIENCE

- President - Biomedical Engineering Society
- Tutor - College of Engineering
- Academic Mentor - The Chelsea Collaborative
- Emergency Department Volunteer - Our Lady of Lourdes Hospital

SKILLS

- Software: MATLAB, C, Python, IDE, Microsoft Office, EH
- Laboratory/Medical: Cell Culture, Cell Assays, Phlebotomy, EKG
- Coursework: Organic Chemistry, Biochemistry, Biomaterials, Statistics, Electric Circuits, Tissue Engineering

Yuyang Kang

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Education

Boston University, Department of Electrical Computer Engineering

- B.S. in **Computer Engineering**, General GPA: **3.71/4.0** Expected May 2023
- **Honors: Dean's List** of Fall 2020, Spring 2021, Fall 2021

Research Experience

Tay Lab, Boston University Sep 2022 – Present

Job Title: Research Assistant for Programming, advisor: Prof. Tuan Leng Tay

- Aimed to design an open-source computational software platform combining machine learning models and pipeline algorithms to detect and quantitatively analyze microglia
- Converted microscope image into designated format for analysis
- Integrated cell counting, morphometrics, and image segmentation with Java-based Netbeans JFrame

Professional Experience

Apple Jul 2022 – Sep 2022

Job Title: Software Development PTA, Advisor: Yuchen Wang

- Utilized Python to perform real industry design and implantation for a backend system, being used for Apple and other major tech firms
- Performed all aspects of application development, including specific features coding, testing, debugging, maintenance and updates
- Maintained awareness of industry trends and evaluated applicability of new software tools to platform development

Course Projects

Reinforcement Learning (Python) Dec 2021

- Utilize neural network and dynamic programming to design reinforcement learning for a racing game to automatically calculate route

Game Design (C++) Jul 2021

- Designed and made a Tetris-like C++ based game with two team members

Web-based Photoshare Application (C#) May 2021

- Designed and implemented a web application platform

Skills

Programming skills: Python, C++, Verilog, C#

Tools: Visual Studio 2022, Jupyter Notebook, Spyder, Postgresql(flask)

Brandon Kao

516 Lincoln Blvd, Santa Monica, CA 90402
(310) 776-0393 bkao1@bu.edu U.S. Citizen

EDUCATION

Boston University – Boston, Massachusetts **Expected May 2023**

- College of Engineering: Bachelor of Science, Biomedical Engineering
- Current G.P.A. – 3.47
- Relevant Coursework: Clinical Applications of Biomedical Devices, Signals and Control Systems, Molecular Bioengineering, Biomedical Materials and Measurements, Business Technologies and Innovations

Harvard-Westlake School – Studio City, CA **2013 – 2019**

- GPA – 4.0; Honor Roll – School Academic Honor 2015 – 2019
- Relevant Coursework: AP Biology, AP Physics, Honors Chemistry, Genetics and Biotechnology, Human Anatomy and Physiology

EXPERIENCE

Kite Pharma – Technical Operations Intern III – Santa Monica, California **May – Aug 2022**

- Interned for the Technical Operations Rotational Program working with the Quality Engineering team at Kite's Research, Development, and Manufacturing Center
- Led and presented quality risk management project to Technical Operations management team
- Assisted development of phase appropriate qualifications standard operating procedure

Boston University Undergraduate Researcher – Boston, Massachusetts **Jun 2021 – May 2022**

- Received Undergraduate Research Opportunities Program(UROP) student research award
- Researched, designed, and executed experiments to study effects of glucose on murine tendon explant health
- Performed murine tendon harvests, tendon culture, mechanical testing, confocal microscopy, and a variety of biochemical assays
- Gave a poster board presentation on my independent study at the Annual Undergraduate Research Symposium

Aleris-Hamlet Hospital, Righospitalet National Hospital – Copenhagen, Denmark **Jun 2018**

- Interned at public and private hospital in Denmark learning about different aspects of cosmetic and reconstructive surgery, including tumor removal, fat transfer, congenital defects, burn trauma and reconstruction
- Participated in adipose derived stem cell enriched fat grafting research with cosmetic company, Stemform

PROJECTS

Synthera Health Point of Care Anemia Diagnostic Test **2022 – 2023**

- Designed and optimized paper based diagnostic test to detect and measure iron-deficiency biomarkers

Race Corrected Pulse Oximeter **Spring 2023**

- Researched, designed, and built working prototype of non-invasive pulse oximetry device that is calibrated for use with every skin tone

Truss Challenge **Fall 2020**

- Designed, tested, and competed for strongest load bearing truss structure
- Wrote MATLAB script to computationally test failure points and loading capabilities of different truss designs

SKILLS

Emergency Medical Technician (EMT) **Summer 2019**

- Certified by National Registry Emergency Medical Technicians (August 2019)
- Completed eight-week UCLA training program to pass the NREMT
- Basic life support provider and CPR certified by American Heart Association (2019)

Microsoft Office Suite, MATLAB, Data Analysis, Cell Culture, Sterile Technique, Microscopy, Mechanical Testing

Krish Kapadia

kkapadia@bu.edu | (408) 688-7786 | linkedin.com/in/krish-kapadia

Education

Boston University, College of Engineering | Boston, MA — Expected 03/23
B.S. in Biomedical Engineering, Minor in Computer Science, Concentration in Machine Learning
GPA: 3.96/4.00 (Summa Cum Laude)
Commitments: BU Snowboarding, Vice President of Global Engineering Brigades, Secretary of Tau Beta Pi

Experience

Boston Scientific Intern | Boston, MA — 05/22 – 08/22
IT Engineering – Digital Health Services Team
- Pioneered company wide digital accessibility policy in a team of 4 interns.
- Led implementation of NestJS based API to automate creation of software bill of materials for IT division.
- Improved digital consent product and preferences center.

Boston University Biomechanics Laboratory | Boston, MA — 12/19 – 05/22
Research Intern – Computer Modelling of Deformations and Fractures in Human Vertebrae
- Independently developed novel CNN algorithm to automate contouring of μCT vertebral body scans.
- Advanced Digital Volume Correlation (DVC) algorithm to study vertebral body compression fracture.
- Collaboratively implemented Artificial Deformation algorithm to test DVC implementation.
- Enhanced existing viewing methods for simultaneous multi-planar comparison of volumetric images.

OmniPayments | San Jose, CA — 05/20 – 09/20
Software Development Intern
- Developed new data analytic models using MySQL, Pentaho BA/BI, and JS to provide real-time feedback to customers on OmniPayments credit card transaction application and hardware platform.

Stanford University, Neuroradiology Department | Stanford, CA — 05/17 – 08/18
Research Intern
- Compiled data for assessment of clinical factors influencing outcome in post-thrombectomy stroke patients.
- Performed data and statistical analysis for peer-reviewed paper studying accuracy of brain MRI using ASL.

Projects

Developing Novel Panoramic Camera for the Detection of Colorectal Cancer — 08/22 – 05/23
- Designing a multispectral illumination and imaging device with rotation and vertical translation features.
- Developing a GUI for physicians to acquire images and software for image de-warping and stitching to present 2-D map of the rectal wall.
- Creating pigmented silicone and titanium dioxide based phantoms resembling rectal structure to test device.

Studied Biomarkers in human saliva to diagnose Dehydration, Sepsis, and Concussions — 08/15 – 05/18
- Collaboration with SJ BioCube, Stanford, and Good Samaritan Hospital to study biomarkers in human saliva.
- Presented work at regional, state, and international science fairs and at physician conferences.

Skills

Technical: Java, Matlab, C, ImageJ, Python, JavaScript, TypeScript, GIT, MySQL

Volunteer

- Redistributed leftover groceries to food pantries in Boston area through Student Food Rescue. 09/21 – 12/22
- Prepared lunch and dinner for those in need in San Jose area through Martha's Kitchen. 05/20 – 09/20

Honors & Awards

- Intel International Science and Engineering Fair: 4th place in Translational Medicine. 2018
- Synopsys Science & Eng Fair: Grand Prize, Best in Championship in Biological Science. 2018
- California State Science Fair: 1st Place, Senior Mammalian Biology. 2017
- Synopsys Science & Eng Fair n+1 Award: Next Breakthrough in Science & Engineering. 2017
- Synopsys 1st Place and Mayor of Los Gatos, CA commendation. 2016 – 2018

Publications

Heit JJ, Thakur NH, Iv M, Fischbein NJ, Wintermark M, Dodd RL, Steinberg GK, Chang SD, Kapadia KB, Zaharchuk G. Arterial-spin labeling MRI identifies residual cerebral arteriovenous malformation following stereotactic radiosurgery treatment. J Neuroradiology. 2020 Feb; 47(1):13-19

Marian Karam Díaz

mkaram@bu.edu • (954) 682-6840 • www.linkedin.com/in/mariankaram

EDUCATION

Bachelor of Science, Biomedical Engineering – Boston University Expected May 2023
Boston, Massachusetts
Associate Degree in Engineering – **Broward College** May 2020
Davie, Florida; Bright Future Academic Scholarship

CERTIFICATIONS

- **Immunology and Physiology Course -** Harvard Medical School Online HMX
- **Physics of Life Certificate -** Princeton University
- **EMT Certified –** Massachusetts

RELEVANT COURSEWORK AND SKILLS

Mechanics | Fluid Biomechanics| Engineering Molecular Biology| | Systems Physiology | Electrical Circuits | Design and Diagnostics | Programming| Critical Thinker | Problem solving | English and Spanish | Leadership |

PROJECTS

- Designed a port connection shield to prevent infection during hemodialysis
- Programed with MATLAB and built a pulse oximeter, using an Arduino and electric circuits
- Currently creating an innovative quantitative tool which measures motor and sensory dysfunction in children with Cerebral Palsy

EXPERIENCE

Process Engineer Co-Op – Pfizer Jul 2023 – Jan 2024
- Lead and Manage CAPA Visual management boards
- Involved in engineering and managing projects as well as monitoring activities

Research Analyst - Harvard Medical School and Massachusetts General Hospital Jan 2021 – Present
- Survey research studies led by Transplant surgery attendants about the perception of the COVID-19 vaccine amongst transplant patients
- Administer surveys, gathered data and perform data analysis of data

Engineer Intern – HearWeGo Now Jun – Aug 2022
- Assessed computer system and shadowed Dr. Shapiro AuD
- Fixed malfunctioning hardware and assembled devices distributed by manufacturer
- Tested efficacy of equipment by screening patient concerns and processing electronic data

ACTIVITIES

Medical Congress Nominee - University of Massachusetts Jun 2016
- Nominated to be a delegate at the National Academy of Future Physicians and Medical Scientist Congress representing Marjory Stoneman Douglas High School

National Youth Leadership Forum – University of California Los Angeles Jul 2016
- Hands-on medical experience, collaborated with doctors, testing medical knowledge during clinical skills rotations, and medical simulations at the Cedars-Sinai Medical Center in Beverly Hills

Ultimate Medicine Immersion (Youth Future International) - Ahmedabad, India Jul – Aug 2017
- Shadowed and observed daily routines of physicians specialized in different branches, learning about diagnostic techniques and treatments
- Experienced live surgeries, and volunteered teaching at local middle schools

Disaster Action Team (D.A.T) – Red Cross Oct 2019 – May 2021
- Volunteered as a first responder to emergency cases, providing comfort and hope to victims of tragedy

Clubs and Organizations Sep 2020 – May 2023
- UNICEF BU, Pre-Medical Society, Society of Women Engineers

Jordana Kasaato

jnkasaato@gmail.com • (781) 353-8588 • Boston, MA , 02215

EDUCATION

Boston University College of Engineering, Boston, MA — Expected May 2024
Bachelor of Science in Biomedical Engineering

Relevant Coursework

Device Diagnostics & Design	Thermodynamics	Signals & Controls
Biomedical Measurements	Differential Equations	Probability and Statistics
Molecular Cell Biology	Probability and Statistics	Engineering Mechanics

PROJECTS

Decentralized Token Exchange | Boston, MA — January - March 2023
- Developed a decentralized marketplace to buy, sell, and trade currency using Solidity and Javascript.
- Constructed a synthetic token, capable trade with other currencies, following ERC20 token standard.
- Created responsive designs for optimal viewing on both desktop and mobile devices.
- Implemented an order book to manage and display all completed orders.

Dry Eyes Symptom Relieving Device | Boston, MA — January - March 2022
- Researched different forms of dry eye relief methods to adapt a long-term model to provide comfort, convenience, and affordability for users.
- Performed qualitative research to prioritize needs of each persona group to ensure a positive and helpful user experience.
- Tested and redesigned prototypes to optimize functionality of the device.

Drug Preservation Device | Boston, MA — September - December 2021
- Designed, manufactured, and tested a portable device to measure humidity, control temperature, and send warning signals to users in case of issues arising.
- Conducted interviews to understand user pain points and needs.
- Redesigned prototypes based on user testing to optimize performance in temperature control.

WORK EXPERIENCE

Undergraduate Research Assistant | Cambridge, MA — October 2022 - Present
Niji Neuroscience
- Developed a predictive models to diagnose Alzheimer's Disease with a team of five Biomedical Engineer students.
- Analyzed and compared three classification machines to compile a combination of neuroimaging features to optimize the classification rate.
- Provided assistance and recommendations for classification and data analysis based on exhaustive literature reviews.

LEADERSHIP EXPERIENCE

Student Leader | Boston, MA — January 2020 - Present
Boston University Navigators
- Managed community building events for members and prospective students.
- Lobbied for and promoted annual fundraisers to raise funds for a student activities space on campus.
- Hosted weekly study sessions for students and participated in monthly community service events.

Mentorship Initiative Member| Boston, MA — January 2020 - December 2022
Boston University Navigators
- Formulated groups based on interests, commitments, and time capacities to foster advantageous and valuable partnerships between students.
- Mentored two students with a focus on academic, spiritual, and personal growth.
- Organized events to highlight and celebrate the impact of mentorship for students and alumni.

SKILLS

Programming Languages: Javascript, MATLAB, Solidity, C/C++
Computer: Machine Learning, Onshape, Arduino, Remix, React
Lab: Gel Electrophoresis, Cell Culture, PCR, Bacterial Transformation, Chromatography

George Perry Katsarakes

perryk@bu.edu | 860-617-9770 | www.linkedin.com/in/perry-katsarakes | Amston, CT

EDUCATION

Boston University Boston, MA

- B.S. in Biomedical Engineering, Kilachand Honors College Expected May 2023
- Computer Science minor, Nanotechnology concentration, 3.82 / 4.00 cumulative GPA

WORK AND RESEARCH EXPERIENCE

Researcher, Neuromodulation and Tissue Engineering Lab September 2022 - Present

- Researching impact of ultrasound treatment on efficacy of cancer drugs

Course Assistant for BU Computer Programming II January 2022 - Present

- Tutoring other undergraduate students in core concepts of Java, holding office hours, leading study sessions, and grading students' work

Researcher, Dennis Laboratory (Nanobiotechnology) February 2021 - Present

- Exploring aspects of quantum dot (semiconductor nanoparticle) applications and cytotoxicity both independently and in collaboration with graduate students
- Experimental design, data collection and analysis, and presentation of findings
- Working part-time (20h) during semesters and full time (40h) during summer months

Lab Assistant, Finzi Laboratory (Biogeochemistry) September 2020 - May 2021

- Engaged in data collection and analysis for a soil chemistry project

ACTIVITIES, PROJECTS, AND AWARDS

Biomedical Engineering Society

- Presented at 2021 and 2022 BMES conferences, joined society in 2019

World Molecular Imaging Society

- Presented at 2022 WMIS conference, joined society in 2022

Pulse Oximeter (BU EK210)

- Independently developed and built a pulse oximeter as an indicator of COVID-19

BU Hearts for the Homeless

- Part of a student panel to help guide other members interested in research

BU Lutchen Fellowship

- $10,000 grant given to 10 engineering students, used at the Dennis Laboratory

BU Undergraduate Research Opportunities Program, Fall 2021, Spring / Fall 2022

- Two awards totaling $2,800 and a travel grant of $400 as funding for research

SKILLS

Research

- Trained in air-free chemistry, nanoparticle synthesis/encapsulation, XRD, SAXS, MP-AES, TEM, cell culture, cell viability assays, ROS assays, mouse models, etc.

Programming, CAD, and Game Development

- Experience with MATLAB, Java, Typescript, React, C, Lua, HTML/CSS, Onshape, Angular, etc. and a 150 WPM typing speed
- Freelance game developer using Lua and 3D modeling/rendering in Blender

Classical Piano

- Classical training for 12 years, repertoire includes Beethoven's Waldstein Sonata, Liszt's 1st Mephisto Waltz, Ravel's Toccata, and Chopin's 3rd Scherzo

Owen Kelly

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EDUCATION

Boston University Boston, MA — Expected May 2023
Bachelor of Science in Biomedical Engineering
GPA: 3.86/4.00
Honors: Dean's List

Archbishop Williams High School Braintree, MA — May 2019
High School Diploma

PROFESSIONAL EXPERIENCE

The Tien Group at Boston University, Boston, MA
Undergraduate Researcher — November 2020 – Present

- Researching the effect that lymphatic endothelial cells have on escape and invasion of MDA-MB-231 breast cancer tumors by creating a 3D *in vitro* model
- Characterizing tumor-lymphatic model for markers seen *in vivo*
- Daily imaging, analysis, culturing, and maintenance of tumor-lymphatic samples

Senior Capstone Research Project — September 2022 – Present

- Creating novel *in vitro* model of human luminal breast cancer microenvironment
- Analyzing tumor samples daily to calculate extent of invasion into extracellular matrix and escape into lymphatic vessels

South Shore Orthopedics, Hingham, MA
Medical Scribe — May 2022 – September 2022

- Assisted medical professionals and orthopedic surgeons in the clinic by documenting any procedures or exams that take place during patient appointments
- Updated patients' medical records throughout the duration of the appointment
- Attained foundational knowledge of medical terminology

ACADEMIC PROJECTS

Developing an *in vitro* model of luminal breast cancer
The Tien Group at Boston University — September 2022 – Present

- Developing a 3D *in vitro* invasion and escape model of luminal ER+ human breast cancer cells into lymphatic vasculature

Truss Project
ENG EK301 at Boston University — September 2020 – December 2020

- Engineered a scaled-down truss that can bear a load using mechanics principles learned in the class

Pulse Oximeter Project
ENG EK210 at Boston University — September 2020 – December 2020

- Designed and manufactured a pulse oximeter using engineering principles

VOLUNTEER AND LEADERSHIP EXPERIENCE

Prayers for Charlotte
Board Member — April 2017 - Present
Braintree, MA

- Serves as one of the primary coordinators of the road race for our 501c3 foundation, in honor of my sister Charlotte, who passed to childhood cancer

Camp Sunshine
Volunteer — July 2019, August 2020
Casco, ME

- Volunteered as a counselor for a retreat camp for children battling life-threatening illnesses

Rashid B. Kolaghassi

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EDUCATION:

Boston University College of Engineering **B.S.** In Mechanical Engineering **GPA: 4.00.** May 2023
Economics Minor **Machine Learning Concentration**
Coursework: Intro to Machine Learning; Deep Learning; Software Engineering; Algorithms; Product Design; Instrumentation; Material Science; Electric Circuits; Computer Aided Design

EXPERIENCE:

Boston University, Bayesian Autonomous Research Lab | Boston, MA May - August 2022
Undergraduate Researcher
- Developed data-driven deep learning model using TensorFlow and Keras libraries to predict amount of energy a structure can absorb before failure for design process optimization.
- Reduced computation time from 20 mins to 40 seconds of existing Gaussian Process Model to check whether a design can be 3D printed via development of Neural Network model with 97% correct classification rate.

Boston University Materials Laboratory | Boston, MA May - August 2021
Undergraduate Researcher
- Expedited by three order research project timeframes. Streamlined and machined fixtures and parts needed for experiments using turning, milling and additive processes.
- Implemented formulation and preparation of molten salt fluxes for solar grade silicon production.

PROJECTS:

SynapseSafe: Automated Concussion Detection Device for Athletes Fall 2022 - Ongoing
- Led team of biomedical and machine learning engineers in pioneering an automated concussion detection system via measurement of electroencephalogram (EEG) signal and cerebral blood flow of athletes.
- Designed EEG device and established data collection pipeline of live EEG signals from athletes in field.
- Processed raw EEG data to extract features from signals identified to be clinically relevant in concussion detection.

Effect of FDI on Unsustainable Environmental Degradation Fall 2021
- Investigated effect of Foreign Direct Investment (FDI) on irreversible environmental damage by analyzing cross sectional data of 217 countries.
- Tested complex regression models (linear, quadratic, interaction, log models).
- Discovered a statistically significant relationship between FDI inflows and irreversible environmental damage in recipient countries, supporting research conducted in an understudied area of environmental economics.

Blood Oximeter Prototype Fall 2020
- Designed and produced blood oximeter to alleviate medical device shortage during COVID peak pandemic.
- Sourced, assembled and troubleshot oximeter circuitry capable of measuring O_2 saturation levels accurate to +/-2%.

SKILLS & INTERESTS:

Technical: C++, Python, TensorFlow, PyTorch, scikit-learn, Seaborn, STATA, MATLAB, SolidWorks, Creo Parametric
Societies: Dean's List 2019-2023, Member of Tau Beta Pi, Officer in American Institute of Aeronautics & Astronautics
Languages: Fluent in Arabic
Portfolio: www.rashid-kolaghassi.weebly.com/ **US citizen**

Farida Korna

Boston, MA 02215, Email: farida1@bu.edu , Phone: 617-899-2908

EDUCATION

Boston University College of Engineering **Expected May 2023**

B.S. in Biomedical Engineering with a concentration in Machine Learning

Relevant Coursework: Machine Learning, Digital Signal Processing, Signals and Controls, Physiology, Robotics

Cumulative GPA : 3.83 ; Dean's List: Seven Semesters

SKILLS

Computer Skills: Microsoft Office , Programming (MATLAB, C++, Linux) , and Adobe Creative Cloud (Premier Pro, Rush), Freesurfer

Lab Skills: Histology Staining, Microtome Sectioning, Raman Spectroscopy, Biochemical Assays

RESEARCH EXPERIENCE

Undergraduate Researcher at the Albro Lab **Jan 2022 - Present**

- Received the Distinguished Summer Research Fellowship (DSRF) to work on Raman project
- Co-authored an abstract published in the Orthopedic Research Society (ORS) and SB3C
- Awarded UROP funding to continue working on project during fall and spring semesters
- Analyzed and processed Raman data using MATLAB algorithm to produce and present results
- Proved research hypothesis with a correlation R2 of 0.85 between Raman data and chemical results
- Presented and discussed findings in a professional setting

JOB EXPERIENCE

Mechanics Learning Assistant **Jan 2021 - May 2022**

- Gauged student understanding by asking questions and encouraging discussions
- Organized 3 revision sessions prior to exams and designed surveys to collect student feedback
- Constructed and implemented a plan to improve student engagement with class material

PROJECTS

Senior Design Project **Sep 2023 - Present**

- Generated and processed MRI image datasets based on age, gender, and health status
- Created a MATLAB algorithm to extract novel features in MRI white matter lesions
- Validated and tested algorithm to ensure accuracy and precision

Pulse Oximeter **Jan 2022 - May 2022**

- Designed and tested an accessible ear and finger clip-on pulse oximeter prototype with a team
- Programmed an Arduino C++ script to analyze optical data from human subjects

COMMUNITY SERVICE

Participant in breast cancer awareness campaign **Oct 2019**

- Conceived a school-wide event to raise breast cancer awareness between students and teachers
- Lectured on how to help cancer patients
- Devised 4 engaging games and activities for participants

Volunteer at Al-Wafaa Center **Sep 2019**

- Created activities and games for 50 mentally impaired adults
- Engaged in group activities with 30 adults

LEADERSHIP

President of BU Egyptian Club **Sep 2022 - Present**

- Reached out to other university clubs for networking and joint events
- Arranged and planned 5 cultural club events

Evgeniia (Jane) Kozlova

ekozlova@bu.edu | (339) 229-2929 |https://www.linkedin.com/in/evgeniia-kozlova-bme/ | Boston, MA

EDUCATION

Boston University College of Engineering *Boston, MA*
B.S in Biomedical Engineering, Minor in Computer Science (GPA: 3.48) *Expected May 2023*

RELEVANT COURSEWORK

Signals & Controls Systems	Thermodynamics & Statistical Mechanics	Electric Circuits
Device Diagnostics and Design	Solid Biomechanics	Intro to Machine Learning
Clinical Applications of Biomedical Design	Systems Physiology	Transport Phenomena in Living Systems

EXPERIENCE

Research Assistant at Bio-Imaging & Informatics Lab, BU, MA *January 2022 – Present*

- Examined and organized data for over 3000 patients from ADNI database to explore new imaging features of fMRI and assess previously undetectable changes of healthy or diseased brain structure
- Researched neuroimaging markers for studying Gulf War Illness to advance previously published article about tissue microstructural diffusivity and translocator protein PET modalities in GWI

Signal Processing Engineering Intern at BioSig Technologies Inc., LA, CA *July – August 2022*

- Conducted Power Spectrum, Spectrogram, and Frequency-Domain analysis of patient data from PURE-EP systems in MATLAB utilizing various types of filtering ECG and Ablation signals
- Prepared final presentation, reported most efficient bandwidth of intracardiac signals from bipolar recordings and advantages of implementing Kaiser windowing in spectrogram analysis

PROJECTS

Biomedical Measurements Group Proposal *March – May 2022*

- Produced research plan and strategy including specific aims, significance, and approach to perform Bioluminescence Imaging of Herpes Simplex Virus 1 and 2 implementing split luciferase
- Provided scientific background and defined an innovative method during final group presentation in front of 30 students

Engineering Mechanics Group Truss design project *March – May 2021*

- Optimized truss design to fit load-to-cost ratio maintaining minimum cost while minimizing uncertainty
- Accounted for dead load factor into analysis and constructed a non-standard truss
- Analyzed structure by dealing with large amounts of data and assembled final physical model

MATLAB Data Analysis Project *April – May 2020*

- Examined commercialization, adoption, and impact of genetically engineered crops on plant-based farming industry in United States
- Found correlations between genetically modified crop usage and financial input and output growth in farming industry and collaborated with team member to create MATLAB programs and graphs

LEADERSHIP

Cofounder and administrator, CS Technical Interview Preparation club at BU *September 2021 – Present*
Member and mentee, Society of Women in Engineering at BU *September 2021 – Present*
Organizer of events (volunteer), Charity Fund "Find a family" *Summer 2019*
High school Algebra/Geometry Tutor, Independent. *September 2018 – Mat 2019*

SKILLS

Language: English, Russian, German, Spanish
Software: MATLAB, Python, Java, Unix, C, MS Office, AutoCAD, Docker
Cellular Biology Lab: Genotyping with qPCR, DNA extraction, plasma isolation
Protein Drug Design Lab: discovery of the origin of drug resistance, design of a protein drug
Computer Science: searching & sorting algorithms, recursion, linked lists, stacks, queues, trees, hash tables
Additional: Optical sensors, thermal sensors, OP AMP, Arduino, cartesian geometry, discrete math

TOMER KUSHNER

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EDUCATION

Boston University College of Engineering | May 2023
Bachelor of Science in Biomedical Engineering, Dean's List Recipient for three semesters
Cumulative GPA: 3.11
Activities: Head of the life detection sub-team, Boston University Mars Rover Club
Coursework: Molecular Cell Biology, Calculus, Molecular Bioengineering, Fluid Dynamics, Engineering Mechanics, Biomedical Measurements, Systems Physiology, Electric Circuits, Thermodynamics, Medical Device Design, Material Science, Chemistry, Organic Chemistry, Physics, Signals and Controls, Linear Algebra, Engineering Design, Genetics

PROJECTS

Johnson & Johnson, DePuy Synthes | September 2022 - Present
Project Javelin

- Developed procedure for synthesizing surface nanoparticles on titanium for antibacterial effectiveness on prosthetic implants
- Employed wet lab techniques such as hydrothermal synthesis, anodization, passivation, and thermal oxidation
- Collaborated with DePuy Synthes team to optimize procedure for maximum efficacy and reproducibility

WORK EXPERIENCE

Brigham and Women's Hospital, Jamaica Plain, MA | June 2019 - September 2021
Research Assistant, Melanoma Risk Stratification Project

- Launched iPad screening technology for detection of at-risk patients for melanoma. Communicated with physicians and other medical professionals for smooth implementation of the risk detection application
- Supervised use of iPad technology in two BWH primary care facilities around Boston
- Collected and analyzed data from 2000+ patients and presented findings to BWH Mohs Dermatology department. Detected a high-risk factor for melanoma in ~ 5% of patients

Research Assistant, Squamous Cell Carcinoma Data Analytics

- Organized 1000+ past cases of squamous cell carcinoma in BWH Mohs department for centralized database
- Utilized EPIC software to examine patient histories for correlation factors with squamous cell carcinoma

Liora's Catering, Boston, MA | August 2016 - Present

- Managed catering logistics for events ranging from 20-200 attendees
- Coordinated with clients to plan menus and execute events smoothly

SKILLS

Computer

- MATLAB
- Python
- Microsoft Excel
- CAD Solidworks

Language

- English (native)
- Hebrew (native)
- Spanish (basic)

Dogancan E. Kuyel

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EDUCATION

Boston University College of Engineering — Boston, MA
Bachelor of Science, Biomedical Engineering, GPA: 3.51/4.00 — Expected May 2023

RELEVANT COURSEWORK

Signals and Controls, Molecular Biology and Biotechnology, Fluid Mechanics, Systems Physiology, Device Diagnostics and Design, Probability Statistics and Data Sciences for Engineers, Molecular Bioengineering, Optical Microscopy of Biological Materials

EXPERIENCE

Undergraduate Lab Assistant at Wilson Wong Lab at BU — Sep 2021 - Present

- Designed primers & constructs on Benchling to model plasmids
- Implemented: PCRs, Gel Electrophoresis, Gel Extractions, Backbone digests, Gibson Assemblies, Transformations, Test Cuts, and Midi prep to complete cloning of plasmids
- Picked Bacterial Colonies and grew bacteria in a shaking incubator to prep the bacteria for DNA amplification
- Packaged plasmids for sequencing and analyzed sequencing results on Benchling to verify if insert is in plasmid
- Developed basic Tissue Culture techniques to measure CD69 expression in Jurkat cells
- Participated in lab meetings and symposiums and gained exposure to synthetic biology
- Presented poster on summer research at the Boston University Undergraduate Research Opportunities Program Symposium in October 2022

Teaching Assistant for Introduction to Programming for Engineers at BU — Sep 2021 - May 2022

- Facilitated office hours, lab sections, review sessions for students before midterms and exams
- Led discussion sections with more than 20 students to aid understanding of new material
- Proctored final exam, graded exams and provided constructive feedback to students

PROJECTS

Investigating Effects of Pulmonary Diseases on Lung Acoustics as Diagnostic Biomarker — Sep 2022 - Present

- Senior design project with Professor Hadi Nia as principal investigator where a publication by next summer is intended
- Designed different lung models with varying parameters using a glass jar, plastics and papers, and soft modeling compounds
- Lung model parameters that changed: neck length and diameter of jar
- Utilized speaker to stimulate the jar with different audio frequencies and collected incoming frequencies from the lung model
- Data analysis performed by senior design team utilizing MATLAB to apply FFT to sound data to determine the resonance of each lung model
- Construction of a negative pressure chamber used to inflate the lung done by senior design team for pig lung

Characterization of the Activation Profile of CAR T Cells with Varying Hinge Domains — Jun 2022 - Aug 2022

- Prepared models of 2^{nd}/3^{rd} generation Chimeric Antigen Receptor (CAR) constructs with varying hinges on Benchling
- Executed cloning techniques such as to synthesize, purify, and amplify plasmids containing the CAR gene
- Integrated plasmids into lentivirus by transfecting HEK 293 cells, collected virus, transduced Jurkat cells with collected virus, and ran activation assays to measure CD69 expression on Jurkat cells
- Analyzed data on FlowJo and used Excel to graph findings

Pulse Oximeter Group Class Project — Jan 2022 - May 2022

- Developed a device that reads the concentration of bicarbonate and the partial pressure of carbon dioxide
- Introduced mathematical formulas using research to develop software on Arduino IE that will enable the device to sample the concentration of bicarbonate and partial pressure of carbon dioxide
- Utilized Arduino IDE to control buzzer, LEDs, LCD, Atlas Scientific pH sensor during hardware construction

SKILLS

- Wet lab: Cloning and transfection techniques, Microscope, Thermocycler, Flow Cytometer, Pipetting skills, Mini Centrifuge, TC Hood, Vacuum Manifold, Incubator, Bead Bath, UV Transilluminator, FlowJo, Benchling, Cell Counting
- Software/Hardware: MATLAB, C, Atmel Mega microcontroller, AutoCAD, ImageJ/Fiji, Microsoft Office, COMSOL, Drill
- Languages: Turkish

Tucker Lau

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EDUCATION

Boston University, College of Engineering — Expected May 2023
B. Sc. in Biomedical Engineering. 3.22 GPA. — Boston, MA
- Boston Public Schools Community Service Scholar

Boston Latin School — September 2016 – May 2019
College Preparatory Curriculum; course load of Honors & AP classes. 3.79 GPA. — Boston, MA

WORK EXPERIENCE

Tufts Medical Center — July 2019 – August 2019
Biomedical Engineering Intern — Boston, MA
- Repaired medical equipment and devices
- Replaced dead batteries and faulty wiring in circuitry of defibrillators and patient monitors
- Maintained usability of medical equipment while rounding hospital
- Replaced tags on defibrillators and monitors
- Assembled new equipment such as floor weighing scales for installation
- Shadowed in operating rooms

State Street Corporation — July 2018 – August 2018
Intern — Boston, MA
- Compiled clients' collateral data into standardized spreadsheets in Microsoft Excel and Access
- Maintained records of client data and kept data ordered
- Digitized folders of client data and uploaded data to record keeping website

Pandemonium Books & Games — May 2017 – July 2018
Tournament Organizer — Cambridge, MA
- Registered players into weekly gaming tournaments
- Ensured players' matches run in timely fashion, settle disputes, track results, and report placements to owner

VOLUNTEER EXPERIENCE

Boston Debate League — October 2021 – December 2022
Debate Judge — Boston, MA
- Judged tournament debates for middle and high school debate teams on weekends
- Encouraged novice and junior varsity debaters and provide constructive feedback

Boston Latin School — August 2017 – May 2019
Nurse's Office Volunteer, Wolfpack Volunteer — Boston, MA
- Guided students to nurse's office and distribute passes upon request
- Volunteered to set up and cleaned up for public events

SKILLS & INTERESTS

Computer:	Advanced in Microsoft Word and Excel; proficient in PowerPoint and Access, skilled in Java and Matlab programming
Language:	English (native), Cantonese (basic), Mandarin (basic)
Personal:	Highly organized, quick learner, time efficient, works well with momentum
Interests:	Basketball, speedrunning (beating video games fast), trivia, word puzzles

Megan Le

megan.le416@gmail.com • (610) 761-0429 • linkedin.com/in/meganle49 • Boston, MA, 02215

EDUCATION

Boston University Boston, MA
Bachelor of Science in Biomedical Engineering; Minor in Mechanical Engineering May 2023
- GPA: 3.75/4.00 (Dean's List)

Imperial College London London, UK
Master of Science in Human and Biological Robotics Oct 2024

Relevant Coursework
Biomechanics | Soft Robotics | Engineering Design | Electric Circuits | Mechanics of Materials | Biomaterials | Fluid Mechanics | Manufacturing Processes | Signals and Controls | Thermodynamics | Probability and Statistics

SKILLS

Software: MATLAB, C, SolidWorks, AutoCAD, Minitab, Microsoft Office
Laboratory/Manufacturing: Microscopy, Spectroscopy, Soldering, Heat press, Laser cutter, Instron
Certifications: Lean Six Sigma - Yellow Belt

WORK EXPERIENCE

AstraZeneca Coppell, TX
Project Management/Engineering Intern Jun – Aug 2022
- Led and conducted 4-factor, 2-level Design of Experiments using Minitab to determine optimal parameters of Waste Treatment System, collaborating with interdisciplinary teams
- Analyzed data in Minitab and documented project findings in technical report
- Optimized system parameters by decreasing low:high silica ratio by 0.5, increasing acid addition rate by 3%, and adjusting pH setpoints to improve processing performance of high silica waste

RESEARCH EXPERIENCE

Boston University Morphable Biorobotics Lab Boston, MA
Undergraduate Research Assistant | PI: Dr. Tommaso Ranzani Sep 2022 – Present
- Fabricated textile beam samples and implemented magnetically-induced stiffening mechanisms utilizing magnetorheological fluid (MRF) and varying jamming methods of fiber, layer, or granular material
- Tested samples and analyzed data collected from three-point bend test on Instron under different magnetic fields to determine stiffening force
- Develop thermoplastic elastomer structure integrated with MRF to analyze applied forces under a magnetic field

PROJECTS

Soft Robotics for Active Resistance Hand Rehabilitation Sep 2022 – Present
- Lead a team to design a soft, wearable robotic glove to rehabilitate hand muscle strength
- Fabricate prototypes with implemented stiffening mechanisms utilizing magnetorheological fluid, electropermanent magnets, and jamming methods
- Test prototypes under magnetically-induced stiffening by applying forces until failure
- Document methods and results in technical report and present at senior design conference

PUBLICATIONS

Gaeta, L.T., McDonald, K., Kinnicutt, L., Le, M., Wilkinson-Flicker, S., Jiang, Y., Atakuru, T., Samur, E., and Ranzani, T. (2023) Magnetically Induced Stiffening for Soft Robotics. *Soft Matter*, *19*(14), 2623-2636.

Matthew Leal

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Education

Boston University, College of Engineering
Bachelor of Science in Biomedical Engineering with a Minor in Public Health — Boston, MA | May 2023
Kilachand Honors College
GPA: 3.56 out of 4.0 | Deans List

Work Experience

BU Material Robotics Laboratory – Research Assistant — Boston, MA | May 2022 - Present

- Designing soft, foldable actuators for surgical robots to add dexterity to endoscopes used in minimally invasive surgery.
- Manufacturing actuators with a heat press and laser cutter, utilizing Pop-Up Book MEMS fabrication techniques; reduced cycle time by 30 minutes to 1 hour.
- Developed new techniques to quickly and efficiently prototype new designs in under 1 hour.
- Led design, building, and coding of a syringe pump to inflate actuators on a surgical robot.

Boston Playwrights' Theatre – Work Study — Boston, MA | September 2019 - Present

- Built sets for plays operating numerous machines, power tools, and materials for construction, in addition to using creative thinking, leadership, planning, and design.
- Wired lighting, sound, and other electrical components.

Worcester Polytechnic Institute VIBE Internship – Virtual Intern — Virtual | May - August 2021

- Collaborated with a team 4 other biomedical engineering undergraduates to design a non-invasive medical device to measure blood-glucose levels in diabetes patients.
- Researched solutions and developed a novel prototype solution with SolidWorks.
- Presented a final project to other teams.

Becton, Dickinson and Company – Lab Assistant Intern — Warwick, RI | March - May 2019

- Performed numerous experiments to test durability and capabilities of a surgically implanted device.
- Conducted research in chemical and biomedical research labs conducting stress and durability tests, mixing chemicals, and dissecting animals.

Projects

Pulse Oximeter

- Constructed and programmed a functional prototype using an Arduino for non-invasively measuring blood-oxygen concentration and heart rate, optimized specifically for ease of use during a pandemic.

Isolating Brain Activation Induced Blood Flow from Cerebral Blood Data

- Collaborated with a team of 4 to collect and analyze cerebral blood flow data using Speckle Plethysmography.
- Coded using MATLAB a program to remove cardiac induced blood flow to better analyze brain activity.

Grip Aid for Arthritis Patients

- Led research on a low-cost grip aid to hold household objects which is easy to use, affordable, and sustainable.
- Created working prototypes and interviewed patients and experts to continue making improvements.

Other Projects: Inferring evolution of cancer cells using Phylogenetics, Report on advancement in 3D Bioprinting

Skills

Computer: MATLAB, Python, SolidWorks, GibbsCAM, Abaqus, InDesign, Photoshop, Microsoft Office
Lab: Imaging and Image Processing, Microscopy, PCR, gel-electrophoresis, bacterial cell culture, wet and dry lab
Manufacturing: CNC Mill, Lathe, Drill Press, 3D Printing

Extracurriculars

Suspension and Chassis | BU Terrier Motorsports Team

- Coordinated with other students to design, weld, and fit a suspension and chassis for a car.

Cheng En Chancellor Lee

clee3@bu.edu • (413) 345-9546 • Brookline, MA 02446

EDUCATION

Boston University, Boston, MA *Expected May 2023*
Bachelor of Science in Biomedical Engineering,
GPA: 3.68 • Dean's List

Relevant Coursework:
Biomedical Measurements & Design, Biomedical Signal & Controls, Computational Biology, Machine Learning, Deep Learning for Biomedical Images & Signals, Probability, Statistics, & Data Science, Protein and Drug Delivery, Molecular Cell Biology & Biotechnology

PROFESSIONAL EXPERIENCE

Brain Aging and Dementia Lab (Harvard/MGH); Boston, MA Jun 2022 – Present
Research Assistant

- Developed an independent project using data acquired from cerebral oximetry measurements (fNIRS) to study their association with cerebrovascular health
- Processing signals with the use of machine learning to study their association with neurodegenerative diseases such as Alzheimer's and dementia

Morphable Biorobotics Lab (Boston University); Boston, MA May 2022 – Present
Research Assistant

- Participated in a vascular project aiming to design a soft deployable endovascular balloon for modulation of aortic occlusion in non-torso hemorrhages
- Designed and manufactured endovascular balloons using CAD software and CO_2 laser cutting machines

Brewster Ambulance Service; Boston, MA Aug 2021 – Present
Emergency Medical Technician

- Treated patients at hospitals and scenes of incidents using basic live-saving techniques such as CPR, AED and abdominal thrusts
- Assessed patient conditions, transporting them in and out of ambulance, driving them to and from hospitals, and writing patient care reports after completing transfer of care

EMPOW Studios; Newton, MA Jul – Nov 2022
Tutor

- Organized lessons and taught 7-9 year old students basic engineering principles including introduction to a programming language, design of a simple robot and its controls, and making your own video games

OliToki Restaurant; Boston, MA Jul 2018 – Mar 2021
Staff

- Worked at the register & kitchen by preparing and serving all food on menu; responsible for closing shifts
- Interacted with customers and assisted with special requests such as gluten allergies

Brain Imaging and Informatics Lab (Boston University); Boston, MA Jul – Nov 2020
Research Assistant

- Classified and manipulated large data sets by coding in Python using Pandas software
- Assisted in building machine learning and deep learning classifier on neuroimaging (MRI) data starting with building a pipeline

SKILLS & INTERESTS

Gel electrophoresis, polymerase chain reaction, somatic cell nuclear transfer (basic); Microsoft Suite, MATLAB, Python (NumPy, Pandas, PyTorch), Linux; Spanish (conversational)

Kate Lee

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EDUCATION

Boston University College of Engineering | Boston, MA — Expected May 2023
Bachelor of Science in Biomedical Engineering

Relevant Course Work

Device and Diagnostic Design	Polymers and Soft Materials	Systems Physiology
Signals & Controls Systems	Biomedical Material Science	Thermodynamics & Statistical Mechanic

SKILLS

Laboratory: Digital PCR (dPCR), genotyping/Methylation assays, peptide synthesis, mass spectrometry, DNR/RNA sequencing, cell culture, CNC mill, Drill Press, soldering, laser cutter

Computer: MATLAB, C, Arduino, CAD, SolidWorks, 3D printing

RELEVANT EXPERIENCE

BU Pratt Research Laboratory | Boston, MA — March 2022– present
Undergraduate Research Assistant

- Managed the logistical side of creating a new lab from the ground up: ordering parts, conducting interviews, presenting at lab meetings, grant writing
- Designed liquid biopsy assays for non-invasive cancer monitoring, with a focus in pancreatic cancer
- Created peptide probes to evaluate the activity of enzymes implicated in pancreatic cancer

CECorp (Community Engineering Corps) and EWB | Boston, MA — July 2022 – December 2022
Engineering Consultant

- Consulted and assisted communities that do not have the resources to access engineering services by designing solutions to identified problems
- Identified and solved complications within Monroe's District water system

Technology Innovation Scholars Program (Robotics Department)| Boston, MA — August 2020 – May 2022
Student Mentor

- Mentored Brooke High School: taught and helped 30 students build and enter FIRST robotics competition
- Led projects and workshops for younger students to help gain an engineering mindset

SELECTED PROJECTS

Surgical Device Project, IUD insertion – Device and Diagnostic Design — September 2022- December 2022

- Designed, modeled (CAD), and prototyped new IUD insertion device that replaces the usage of tenaculum during IUD procedures and provides patients with a less invasive, traumatic, and painless experience
- Conducted extensive interviews and research that lead to a suctioning medical device for physician's use

Born Global foundation Competition for Innovation in Sustainability — January 2022- May 2022

- Presented and lead group project on the efficacy of technical innovation and business model of an innovation that is economically and ecologically feasible
- Won third place: "Urban Planning with Modified Mycelium Bricks"

Pulse Oximetry Instrumentation – Engineering Design Project — January 2021 – May 2021

- Designed and prototyped a pulse oximeter to read a person's pulse, heart rate, and blood oxygen levels
- Built a circuit to detect differences in absorption between oxygenated and non-oxygenated blood and coded an Arduino to process and display results in real time with relative accuracy

LEADERSHIP

Vice President, Engineers Without Borders BU Chapter (EWB) — August 2021-January 2023
Outreach and Social Media Chair, Engineers Without Borders BU Chapter (EWB) — August 2020-May2021
Academic Student Advisor, BU College of Engineering — August 2020-May2021

Aurelia Leona

alb68@bu.edu • LinkedIn • Boston, MA

EDUCATION

Boston University | Boston, MA *Expected May 2023*

B.S. in Biomedical Engineering | GPA: 3.79/4.00

Relevant Courses

Molecular Bioengineering, Computational Synthetic Biology, Transports in Living Systems, Thermodynamics, Nanotechnology, Machine Learning, Software Engineering, Applied Algorithms, Systems Physiology, Signals & Controls, Mechanics, Electric Circuits, Differential Equations

SKILLS

- Language: Indonesian(fluent); English(fluent); Chinese(conversational)
- Computer: C++, MATLAB, Python, AutoCAD, Adobe Photoshop & Illustrator, MISCnn, MITKGem
- Lab: Cloning (Type II Restriction Enzyme), Blood Culture, Microscopy (Oil Immersion, Brightfield, Fluorescence, Confocal), PCR, Microfluidics, Midi/Mini prep, Gel Extraction, Centrifuge, Backbone digests

RESEARCH EXPERIENCE

Laboratory Assistant, Boston University | *CIDAR Lab* *Sep 2022 – Present*

- Automating a Fluorescence Microscope by bridging micromanager with code to control fluorescent microscope, do a position calibration and acquire images of multiple experiments on a microfluidic device.
- Utilizing python and machine learning to do image analysis and segmentation on multi chamber cells growth in a microfluidic device. Minimize alignment error to create a steady time lapse of cell growth in chambers.

Research Assistant, Boston University | *Catherine Klapperich Lab* *May 2022 – Present*

- Experimented on Blood Culture, DNA Cloning and Master Mix for ISO-IMRS Assays to identify markers that would indicate presence of chlamydia, gonorrhea and malaria.
- Designed Microfluidic Chips and Lateral Flow Strips and developed its functionalization for point-of-care device with urine specimens.
- Trained in microscopy techniques to image cells in microfluidic wells (Confocal) and growth of culture (Oil-Immersion).

Research Assistant, Boston University | *Elise Morgan Lab* *May – Sep 2022*

- Prepared and produced CT Scan for spine samples.
- Devised algorithms and researched on methods to automate segmentation of spine samples; differentiating variety of bones sections with levels of fractures and degradation through Nibabel and MITKGem.
- Executed experiments and manipulation of MIScnn library to run training data to automate the segmentation process and check for similarity in predictions.

PROJECTS

dSign | *Computational Synthetic Biology course* *Mar – May 2022*

- Designed a web-based DNA signature encryption with a group.
- Developed DNA and information -specific keys by using cryptography algorithms to design unique signatures that can be reversibly or irreversibly embedded into published DNA strand; signature is less than 10 bps.

White Matter Lesion Segmentation for Alzheimer Disease| *Senior Design with Niji Group* *Oct 2022 – Present*

- Proposed and devised a pipeline using existing methods to be able to segment brain white matter lesions.
- Generated novel parameters and features to be able to quantify white matter lesions extensively and in detailed.

WORK EXPERIENCE

Undergraduate Teaching Assistant | *Freshman level Hands on Engineering* *Jan – May 2022*

- Managed class materials, grade students' assignments and hold office hours to support students alongside faculty.

Marketing Communication Assistant Intern, Mentari Group *Sep – Dec 2020*

- Developed and maintained catalog, web articles, official letters, documents, learning, teaching materials, and slides needed for publication or promotion from several Mentari Group divisions. Oversaw learning sessions and consulted.

LEADERSHIP & ACTIVITIES

EK200 Sophomore Mentor| *Boston University Engineering Department* *Aug – Dec 2022*

- Mentored incoming sophomore to ease transition into advanced engineering classes, gaining internships and research experience.

Persatuan Mahasiswa Indonesia di Amerika Serikat (PERMIAS) Nasional *Jun 2021 – Present*

Human Resources and Development Director (2022-2023) | *Officer (2021-2022)*

- Drafted, planned and coordinated organization's first-ever open nation-wide recruitment program, 300 annual applicants.
- Wrote and established officers' monthly evaluation rubric and grading system; oversee the execution for all 10 departments.
- Organized personal, social, and professional development programs for officers and 104 chapters-in-need across the US.

Olivia Lewallen

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EDUCATION

Boston University College of Engineering | Boston, MA — Expected May 2023
Bachelor of Science in Biomedical Engineering
Kilachand Honors College

SKILLS

Prototyping	CAD	Product Development	Robotics	Experiment Design
Programming	Creativity	Data Analysis	3D Printing	Communication
Manufacturing	Illustration	Problem Solving	DFMEA	Biological Wet Lab

PROFESSIONAL EXPERIENCE

Biomedical Research & Teaching Assistant — September 2021 – Present
Bioengineering, Technology, & Entrepreneurship Center (BTEC) | Boston, MA

- Taught microscopy and spectroscopy training sessions and demonstrations
- Wrote and reviewed SOP documentation for laboratory equipment
- Illustrated promotional content to advertise BTEC using Adobe Illustrator & Photoshop

Research Intern — May 2022 – September 2022
Jina Ko Laboratory at the University of Pennsylvania | Philadelphia, PA

- Focused on pathology and laboratory medicine experimentation
- Worked with cell culture and antibody conjugation
- Utilized system engineering principles to design a new microfluidics fabrication system

Undergraduate Researcher — October 2020 – October 2021
Bio Optical & Acoustic Spectroscopy (BOAS) Laboratory | Boston, MA

- Designed autonomous electromechanical systems for tissue storage using MatLab and Arduino
- Controlled pump filtration system using PID methodology using water level sensors

PROJECTS

Cytospinning Apparatus to Increase Cancer Sample Processing | Aperture Bio — 2023

- Remodeled current cytospinning device to increase cancer sample processing by 100%
- Manufactured entirely in-house via 3D printing and machining
- Optimized cytospinning protocol to integrate new device

At-Home User-Focused Device for Sleep Apnea Diagnostics | C.R.U.S.A.D.E. — 2022

- Surveyed patients, doctors, and specialists to identify needs and gain insights
- Conducted human factors research, V&V procedures, and FMEA analysis to maximize success
- Prototyped a looks-like model with sustainable packaging, marketing, and detailed instruction manual
- Programmed a works-like model with breathing and heart monitoring using Arduino

UV Exposure System for Soft Lithography Microfluidics | Jina Ko Laboratory UPenn — 2022

- Designed, manufactured, and quality tested a new UV system for fabricating microfluidic devices
- Reduced costs to 15% of original procedure and significantly improved fabrication efficiency
- Illustrated figures and wrote a published scientific paper on new system

HONORS & AWARDS

Order of the Engineer Member Induction — February 2023
Tri-Alpha Honor Society Member Induction — September 2021
Princeton University “Physics of Life” NSF Summer Program — July 2020
Society of Women Engineers Member Induction — September 2019

Yuhan Li

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EDUCATION

Boston University, Bachelor of Science — Expected Dec 2023
Biomedical Engineering
GPA: 3.84/4.00

PROJECTS

Senior Design Project Software for close-loop feedback — Sep 2022 – Present

- Team leader of 5 to develop algorithm to predict ascending phases of 0.5-4Hz EEG slow wave in real-time from commercial grade EEG device in home environment.
- Design an algorithm to stimulate 50ms pink noise automatically with 0.15ms low latency in ascending phase of deep-sleep slow waves.

MATLAB Project — Sep 2020 – Dec 2020

- Created MATLAB programs to utilize a global database, cooperated with project team to infuse data into spreadsheet, and assessed and predicted sale strategies for global avocado retailers.

Oximeter Prototype Project — Sep 2020 – Dec 2020

- Studied Covid-19 circumstances in a crowded hospital, applying QR code, human tissue absorbing features and Arduino coding program to prototype a cloud-server controlled oximeters function group.

RESEARCH EXPERIENCE

Laboratory Assistant, Boston University — Nov 2021 – Sep 2022
Boston, Massachusetts

- Initiated culture and monitor Dictyostelium strains plates in various experimental conditions. Analyzed cells in darkfield imaging statistical data by software FIJI.
- Led in designing controlled experiment protocols and invented toolkits for 12 hour duration darkfield imaging in humid experiments.

Laboratory Assistant, Shandong University — Jun 2018 – Mar 2019
Jinan, Shandong Province

- Monitored lab supplies and replenished for convenience and availability in department's Arabidopsis greenhouse. Communicated and supplied researchers for laboratory uses.
- Examined experimental data and interpreted results to draft reports of findings. Pushed forward anti-arid gene transfer engineering to next statistical stage.

INTERN EXPERIENCE

Anhui Anke Biotechnology Co., Ltd. — Feb 2021 – Jul 2021
Hefei & Anqing, Anhui Province

- Collected, labeled, and reviewed lab samples according to laboratory specifications.
- Conducted marketing research with the commercial department to devise product designs.

Dynalink Technology — Jun 2020 – Sep 2020
Jinan, Shandong Province

- Interned as Technician assistant. Set up, calibrated, and tested industrial electrical equipment to assess functionality for planned uses.
- Group leader of Innovation team of in circuit designers of handcuff oximeter circuit. Programmed prototype of oximeter product with implementing MATLAB, C++, and AutoCAD.

DianPai Auction — Feb 2020 – Jun 2020
Beijing

- Built user databases structure, responsible for backend server maintenance, and created file systems to fill different needs of other departments.

TECHNICAL SKILLS

Programming: MATLAB, C, JAVA
Model/Software Design: SolidWorks (CAD), Arduino
Hardware: Circuit Soldering

Yuke Li

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EDUCATION

Boston University College of Engineering | Boston, MA
Bachelor of Science in Biomedical Engineering; Concentration in Machine Learning Expected May 2023

- GPA: 3.95/4.00; Dean's List every semester; enrolled in Kilachand Honors College
- UROP Award for Summer 2021, Fall 2021 & Fall 2022

COURSEWORK & TECHNICAL SKILLS

Coursework: Machine Learning, Deep Learning, Computational Biology, Systems Physiology, Signals & Controls, Algorithms for Data Science, Software Engineering
Programming: Python, MATLAB, C/C++, R, SQL, LaTeX, Arduino
Software & Packages: Git, Excel, PyTorch, TensorFlow, NumPy, Pandas, Matplotlib

WORK AND EXPERIENCE

Chand Lab Laboratory Assistant | Boston, MA Mar 2022 – present

- Collected and analyzed behavioral data of Monkey Z with EDA to explore the effect of Methylphenidate on perceptual decision-making processes; found significant increase in arousal for monkey Z.
- Examined Monkey T's neuronal data with deep learning algorithms LFADS to extract "denoised" single-trial firing rates from neural spiking data.
- Defined the task and trained RNN (adapted from PsychRNN) to model the red-green decision-making task; added biological constraints to the model according to Dale's Law.

DS & ML Teaching Assistant | Boston, MA Jan – Dec 2022

- Served as TA for Probability & Statistics (EK381) and Machine Learning (EC414).
- Created and graded weekly homework; held office hours to assist students with course materials.

Sgro Lab Laboratory Assistant | Boston, MA Mar 2021 – Jan 2022

- Developed a targeted gene knock-in system for natural isolated of *D. discoideum.*
- Examined genomic data of natural isolates to screen for potential sites for targeted integration.
- Constructed and tested knock-in vectors containing genes of interest flanked by homology arms.

SELECTED PROJECTS

MATLAB Toolbox for Closed-Loop Neurofeedback | Senior Design

- Collaborate to develop a MATLAB toolbox compatible with commercial EEG headbands to measure brain waves during sleep and deliver sound stimuli in phase with slow wave oscillations.
- Established a stable connection between MuseS and computer to enable seamless data collection.
- Built a Recurrent Neural Network (RNN) model to estimate the instantaneous phase of slow waves.
- Established criteria for stimulation, including defining threshold values for artifact and deep sleep detection, determining the range of phase angles for stimulation, and calculating a confidence interval for RNN predictions.
- Designed and implemented a robust pipeline for EEG data collection, preprocessing, and real-time implementation the RNN model to deliver sound stimulation during deep sleep.

Predictive Risk Modeling for Cancer Recurrence | Computational Biology

- Constructed Bayesian neural network (BNN) to predict risk of recurrence for early-stage, surgically resected cancer patients using clinicopathologic and genomic factors as input.
- Achieved higher accuracy than current TNM-based model.

Pokémon and Peg Solitaire | Software Engineering

- Created a single-player Pokémon game using an object-oriented infrastructure; implemented Model-View-Controller to update statuses of Pokémon; displayed game objects on a dynamic UI.
- Programmed a single-player Peg Solitaire Game with UI as a group project.

LEADERSHIP & ACTIVITIES

College of Engineering Student Advisor | Boston University Sep 2022 – present
Kilachand Honors College Ambassador | Boston University Jan 2020 – May 2022
Student Government E-Board | Boston University Jan 2020 – May 2022
CHOC Children's Hospital Volunteer | Orange, CA Sep 2018 – May 2019

Jason Lipari

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Allston, MA, 02134

EDUCATION

Boston University College of Engineering — Boston, MA
Bachelor of Science in Biomedical Engineering — May 2023
Cumulative GPA: 3.15
Relevant Coursework: Cell Biology, Biomedical Signals, Mechanics, Circuits, Statistics, Biomaterials

WORK EXPERIENCE

Ortho Clinical Diagnostics | Rochester, NY — May 2022 - Aug 2022
Systems Engineering Intern

- Worked with senior staff to verify, test, and design software improvements to company blood analyzers
- Created log parsing tool using Python allowing users to filter system notifications and errors, enhancing workflow efficiency

Fairport Road Wegmans | Rochester, NY — Jul 2016 - Aug 2021
Customer Service Representative

- Ensured positive interactions and outcomes for customers, gaining experience in customer relations

PROJECTS

Senior Design Project Speech Recognition Software | Boston University — Oct 2022 - Present

- Design speech recognition tool using MATLAB to help children with ASD develop speech skills

Machine Learning Pet Classification Project | Boston University — Sep 2021 - Dec 2021

- Created Python script using binary classification to classify and sort 2000 images

Pulse Oximeter | Boston University — Sep 2020 - Dec 2020

- Designed and prototyped a pulse oximeter using Arduino that reads and outputs heart rate and blood oxygen saturation. Wired, coded, and modeled oximeter functionality

Truss Design Project | Boston University — Sep 2020 - Dec 2020

- Completed multi-report project researching truss properties in order to create a structure to hold a maximum load at given constraints. Primarily tasked with developing and optimizing code needed for project reports and virtual truss testing using MATLAB

Machine Learning Binary Classification Project | Boston University — Sep 2019 - Dec 2019

- Created Python script capable of identifying important financial indicators in global economies

LEADERSHIP & VOLUNTEER EXPERIENCE

Theta Tau Psi Delta Chapter E-Board — Sep 2021 - Present

- Served as Judicial Board leader for a fraternity of engineering students, led committee of six people in making judiciary decisions in regard to member actions and activity

UR Medicine Strong Memorial Hospital Volunteer — Summers of 2015 - 2018

- Gained experience interacting with patients, sanitized medical equipment, took blood pressure

Eagle Scout BSA Troop 129 — Jun 2011 - Feb 2017

- Coordinated and led troop events, oversaw risk management in troop activities
- Organized a personal community service project to refurbish a community center. Led 20+ volunteers to renovate and beautify the center over the course of 4 months

SKILLS

- Skills: Statistics & Data Analysis, Python, MATLAB, C, C#, Arduino, Java, Adobe Illustrator, CAD, circuits, Microsoft Excel, Machine Learning

Wei-Fang (Vivian) Liu

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EDUCATION

Boston University College of Engineering — Boston, MA
Bachelor of Science, Biomedical Engineering — Expected May 2023
Current GPA 3.73/4.0 (Dean's List)

RELEVANT COURSEWORK

Intro to Software Engineering	Biomedical Signals and Controls	Principles of Molecular Cell Bio
Applied Algorithms for Engineers	Computational Biology	Device Diagnostics and Design

SKILLS

Languages: C, C++, Python, HTML, MATLAB
Applications: Microsoft Excel, PowerPoint, Word, Arduino

EXPERIENCES

Helios Bioelectronics Inc. — Hsinchu City, Taiwan
Research and Development Intern — Jun – Aug 2022

- Conducted testing and analyzed results of an ongoing project for the development and testing of a bio-sensing semiconductor.
- Devised and implemented 2 testing methods for the HLA protein's peptide detection project in collaboration with Acer.

Material Robotics Lab — Boston, MA
Shadowing Researcher — Feb 2022 – May 2022

- Aided graduate students in building and developing new multi-functional soft material composites for surgical robots.
- Simulated and prototyped 2 soft robotic actuators to optimize performance.

Stem Cells and Tissue Engineering Laboratory — Taipei, Taiwan
Summer Laboratory Intern — Jun – Aug 2021

- Isolated stem cells from 2 rabbit fat tissue samples for joint treatment and burn treatment development.
- Managed the sanitation and preparation of 30 donated human skin samples for temporary burn treatment.

SELECT PROJECTS

Senior Design Project — Spring 2023

- Worked with a team in a project to develop a closed-loop neurofeedback algorithm to improve sleep quality and enhance memory through EEG in-phase sound simulation
- Utilized methods such as data pre-allocation, try-catch, and band-pass filtering to ensure stable connections, extract slow-wave oscillations, and deliver low-latency sound stimulation

Probabilistic Computational Model for Cancer Recurrence Prediction — Fall 2022

- Developed and validated a predictive model for lung cancer recurrence and survival with an accuracy of over 80% using clinical data from 600 patients.
- Built to simplify cancer therapy recommendations and improve patient outcomes.

X-Planner Project — Spring 2022

- Designed and developed a website using Java and C++ for optimizing course selection processes for Boston University students.
- Implemented a unique algorithm accounting for student preferences to display the best-fit course schedules, resulting in a 30% increase in student satisfaction.

Business Strategical Suggestion Project — Spring 2022

- Led a team of 4 members in conducting a comprehensive strategic firm analysis on Toast Inc. to identify key business challenges and opportunities.
- Identified key challenges and opportunities, recommending Toast to expand into new markets and invest in R&D to enhance product offering.

Yongjun Lu

yongjun@bu.edu | LinkedIn: Yongjun Lu | 610-413-3439 | Boston, MA

Education

Boston University – College of Engineering **Boston, MA**
Candidate for Bachelor in Biomedical Engineering *Expected May 2023*
Cumulative GPA: 3.77/4.00
Relevant Coursework: Cellular and Molecular Biology, System Physiology, Computational Linear Algebra, Probability Statistics, Signal and Controls, Biomedical Measurements, Transport Phenomenon in Living Systems, Thermodynamics, Machine Learning, Manufacturing Processes, Mechanics of Materials, Biomedical Optics
Honors & Awards: UROP Student Research Award, Dean's List, NCTTA LNE 2022 Women's Team champion, 2nd Place (2019) and 3rd Place (2022)Women's, NCTTA 2022 Nationals Women's Team 5th place

Professional Experience

SYSVAX INC **Guangdong, China**
Research Assistant Intern *Jun 2021 – Aug 2021*

- Conducted experiments on developing a new antibody purification process for different target proteins in antibody products department
- Cultivated E. Coli in a bioreactor fermentation as protein carriers, prepared chemical solutions for protein purification in AKTA purifier, and ran western Blot to locate target protein among samples

Research Experience

Boston University Bio-Imaging & Informatics Lab **Boston, MA**
Research Assistant *Jun 2022 – Present*

- Designed a pipeline with 3 modules for MRI preprocessing, brain extraction and 3D brain surface registration in FreeSurfer to label brain regions in different colors
- Processed 3000 human MRI neuroimaging from 3D structures into organized dataset with certain parameters
- Developed a mathematical model for a lifetime trajectory of non-human primates' brain aging pattern with control factors age and sex

Projects

Senior Design Project: Softwave for close-loop feedback *Sep 2022 – Present*

- Team of 5 to develop a model to predict ascending phases of 0.5-4Hz sleep slow wave in real-time by training 200 minutes slow wave data streaming from commercial EEG device in home environment
- Design an algorithm to stimulate pink noise for 50ms automatically with 0.15ms low latency in ascending phase of 0.5-4Hz sleep slow wave

Novartis Young Scientist Outreach Mentorship Program *Sep 2021 – Apr 2022*

- Annotated biological-related literatures monthly with mentor and summarized key findings for report
- Researched and presented a study on AD disease conducted by implanting human induced amyloid-β plaques gene into mouse brains

Contactless Pulse Oximeter Design *Jan 2021 – May 2021*

- Team of 4 to design a new contactless pulse oximeter model by implementing a light sensor, detector, and display screen on top of a circuit board
- Measured oxygen level of patients, adjusted model based on data collected, and analyzed data using Arduino

Leadership & Activities

Boston University Table Tennis Club **Boston, MA**
Treasurer, Women's Team Captain *Jun 2019 – Present*

- Captained Boston University women's team to quarterfinals in the National collegiate tournament
- Designed new budget system, increased club balance from $750 to $2070 in one semester

Technical Skills

Programming: MATLAB, C, R, Python
Model/Software Design: SolidWorks (CAD), Arduino
Neuroimaging Program: FreeSurfer, FSL
Languages: English (fluent), Mandarin (native), Cantonese (native)

Daniel Ludwiszewski

Boston, Massachusetts
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EDUCATION

Boston University, College of Engineering **Boston, MA**
Bachelor of Science in Biomedical Engineering, Biology Minor Expected May 2023

- **GPA:** 3.7 / 4.0 **Deans List**
- **Coursework:** Genetics, Molecular Cell Biotechnology, Protein Engineering and Drug Delivery, Clinical Biomedical Design, Programming, Chemistry One & Two, Physics One & Two, Probability and Statistics

PROFESSIONAL & LEADERSHIP EXPERIENCE

Chaikof Lab, Harvard Medical School / Beth Israel Deaconess Medical Center **Boston, MA**
Research Associate May 2021 – Present

- Performed mammalian cell culture and assessments for viability using aseptic laboratory techniques, designed and executed experiments using these cells
- Prepared cell-based assays and performed qPCR to evaluate maturation signs of mammalian Smooth Muscle Cells (SMC) and iPSC Derived SMC in a 2D flask and 3D collagen matrix environment
- Designed and constructed a novel multi-well Tissue Engineered Blood Vessel (TEBV) bioreactor developed for automated vessel conditioning with high uniformity and to allow in-situ drug testing and direct imaging
- Executed mechanical tests of vessel elasticity and burst pressure to determine performance of different engineered tissues and analyzed the data using Python
- Composed lab protocols and standard operating procedures (SOP)

Access Innovation (Under contract to Viscus Biologics) **Andover, MA**
Product Design Consultant May 2019 – September 2020

- Produced 10 field-testable Negative Pressure Wound Therapy device prototypes for preclinical veterinary trials
- Performed data analysis using MATLAB and Excel to assess product variability and impact of wound load; presented results directly to the client CEO during biweekly presentations

MamaWear (Device and Diagnostics Design class project) **Boston, MA**
Founder September 2022 – December 2022

- Designed and prototyped temperature relief shorts for post operation care of lower abdominal surgery (primarily caesarian sections and appendectomies)
- Conducted primary research on patient needs through nine patient and physician interviews
- Constructed and presented pitch decks in collaboration with a team of five, established annual market size of 1.4 million units, identified patient needs, and defined product value proposition

College of Engineering Student Government **Boston, MA**
Class Chair August 2020 – Present

- Elected Class Chair for three consecutive years
- Organized community building events for up to 300 engineering student attendees

Kappa Sigma Fraternity **Boston, MA**
Vice President Jan 2019 – Present

- Managed $30,000 budget for philanthropic activities, campus improvement, and social events
- Received the Donald C. Dilley, Jr. Leadership Award and Scholarship for expanding youth STEM education

ACTIVITIES, SKILLS, INTERESTS

Activities: Nucleate DojoExplore (biotech entrepreneurship program), Technology Innovation Scholars Program
Skills: Mammalian Cell Culture, Restriction Cloning, Molecular Cloning, DNA/RNA Extraction, DNA/RNA Purification, qPCR, Fluorescence Microscopy, Gel Electrophoresis, Flow Cytometry, MATLAB, Python
Interests: Synthetic Biology, Life Sciences, CRISPR, Entrepreneurship, Youth Education, Skiing, Scuba Diving

Taylor Ly

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EDUCATION

Boston University | Boston, MA *Expected May 2023*
B.S., Biomedical Engineering | GPA*: **3.95/4.00***
- Dean's List (all semesters); Student Research Award Recipient (2022); Distinguished Summer Research Fellow (2022)

PROJECTS

Hand Grip Aid | Boston University *September 2022 – December 2022*

- Collaborated with team of 5 students to design, prototype, and demonstrate an intuitive assistive device allowing those with hand grip difficulties to hold and handle common household items
- Applied aspects of design process, such as prototyping, safety considerations, and human factors to ensure product functionality and user-friendliness

Pulse Oximeter Prototyping | Boston University *May 2021 – July 2021*

- Cooperated with team of 4 students on a semester project to design an intuitive and cost-friendly iteration of a pulse oximeter
- Utilized Arduino and 3D printing to prototype and construct a pulse oximeter with accurate blood oxygen and pulse outputs

Patient-Hospital Matching Algorithm | Boston University *October 2020 – December 2020*

- Processed a large data set containing information on all California hospitals using MATLAB Machine Learning Toolbox
- Developed a program to rate and match hospitals to a user based on proximity to user, mortality rate, and type of procedure

WORK EXPERIENCE

Development, Experience, and Motor Recovery Lab | Boston, MA *September 2022 – present*
Senior Design Student

- Work as team of 5 students to develop a child-friendly device measuring contributions of proprioceptive deficits to reaching difficulties in children with cerebral palsy
- Will use Arduino components and 3D printing to construct a device can be applied to adaptively assess a child's ability to make online movement corrections when reaching towards a moving target

Lewis Lab | Boston, MA *October 2021 – present*
Research Assistant

- Execute EEG and MRI preparation and data collection for ongoing studies investigating the effects of sleep deprivation on mood and whole brain activity
- Analyze numerous physiological parameters including eye blink data, brain activity, and levels of blood and brain metabolites to determine relationships between physiological factors and mood in sleep deprivation
- Code experimental tasks within MATLAB to evaluate keyboard input for reaction time before and after a period of sleep

College of Engineering Undergraduate Programs | Boston, MA *September 2021 – November 2021*
Tutor

- Led weekly tutoring sessions in basic calculus, trigonometry, and college algebra for first-year engineering students

VOLUNTEERING

Massachusetts General Hospital Volunteer *October 2022 – present*
Massachusetts General Hospital | Boston, MA

- Ensure safe patient transport between emergency and emergency radiology departments
- Provide administrative support in the volunteering department office through processing and inputting information for incoming volunteers

Food Bank Volunteer *September 2019 – January 2020*
Houston Food Bank | Houston, TX

- Inspected and sorted donated foods to meet safety and quality standards for distribution

SKILLS

Proficient in MATLAB, C, Excel	EEG setup & data collection	MRI safety & setup
Versatile and adaptable learner	Effective communicator and team member	Strong problem-solving skills

Artemis Margaronis

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EDUCATION

Boston University — Boston, MA
Bachelor of Science, Biomedical Engineering — Expected May 2023
GPA: 3.92

Honors and Awards: Barry Goldwater Scholarship | Eleni Gatzoyiannis Scholarship | Kilachand Honors College (top 3% of class) | Dean's List (4/4 semesters) | Kenneth R. Lutchen Distinguished Summer Research Fellowship (1/10 students annually) | Provost's Scholars Award (1/13 awardees in 2021) | David E. Hollowell Scholarship | Undergraduate Research Opportunities Award (UROP)

RESEARCH EXPERIENCE

Dennis Lab, Boston University — Boston, MA
Research Assistant, College of Engineering, Department of Biomedical Engineering — January 2021 - Present

- Synthesize non-toxic semiconductor nanocrystals for applications such as photothermal therapy and nano-therapeutics
- Formulated a novel synthesis of Cu_5FeS_4 plasmonic nanocrystals and incorporating them in antimicrobial therapeutic
- Led incorporation of earth-abundant metals in Cu_5FeS_4 synthesis; presented at Biomedical Engineering Society meeting
- Co-authored publication in Chemistry of Materials (2021) | https://doi.org/10.1021/acs.chemmater.1c02029

Chen (Tissue Microfabrication) Lab, Boston University and Wyss Institute — Boston, MA
Senior design project being completed during 2022-2023 academic year — September 2022 - Present

- Creating a high throughput, *in vitro* assessment of paracrine factors/other signaling perturbations on fibrotic modeling

Merck Research Laboratories, Merck & Co. — Boston, MA
Intern, Discovery Pharmaceutical Sciences Department — May 2022 - August 2022

- Designed and implemented *in vitro* bio-relevant dissolution tools for improved absorption modeling of weak bases
- Conducted solubility experiments on model compounds using an *in situ* UV-based profiler, and independently established a 2-stage transfer model to simulate gastrointestinal dissolution

Bobak Nazer Research Group, Boston University — Boston, MA
Research Intern, College of Engineering, Department of Electrical/Computer Engineering — June 2020 - May 2021

- Performed large scale neural engineering analysis of data collected from behaving mice by utilizing statistical functions
- Developed code using signal processing algorithms to identify spikes from under-sampled novel voltage sensor data

Functional Macromolecular Laboratory, University of Maryland, College Park — College Park, MD
Research Assistant, Department of Chemical and Biomolecular Engineering — May 2017 - July 2019

- Synthesized nanoparticles and created particle hydrogels for enzyme and toxin detection
- Co-authored two manuscripts in Nanoscale (2019) https://bit.ly/3wqG2DB and Langmuir (2020) https://bit.ly/3khbhff
- Presented at the 2018 Mid-Atlantic Soft Matter Workshop (MASM) as the only high school presenter

LEADERSHIP & ACTIVITIES

Undergraduate Women in STEM and Engineering, Boston University — Boston, MA
President, Vice President, Event Coordinator — September 2019 - Present

- Lead over 100 women members each year in navigating their STEM careers and finding jobs and connections

SKILLS

Laboratory: Air free chemistry and particle/hydrogel synthesis, Column: ion exchange resins, gel, gas liquid, HPLC, UPLC, Bacteria and Cell culture (Trained BSL1&2), X-ray diffraction (XRD), Microwave plasma-atomic emission spectroscopy (MP-AES), Absorbance measurements, Dynamic light scattering (DLS), Image and particle analysis using ImageJ, data processing, statistical analysis, Solubility and two stage dissolution assays, including *in situ* UV-based profiler, EdU and FUCCI assays
Programming: MATLAB, R-Statistical software, R-Studio, C, Python, Microsoft Office, Windows, Mac and Cloud computing
Languages: English (native/bilingual proficiency), Greek (native/bilingual proficiency), Spanish (limited working proficiency)

Nicholas Mauro

nickmauro123@gmail.com | Boston, MA | 516-214-7417

EDUCATION

Boston University College of Engineering **Boston, MA**
Bachelor of Science in Biomedical Engineering Concentrating in Technology Innovation Expected May 2023
GPA: 3.81 (Dean's List)

SKILLS

Coding Languages: Matlab, C
Laboratory: cell staining and imaging, cell substrate adhesion assay, fluorescence measurement, restriction enzyme usage, cell cloning, Raman spectroscopy, data and statistical analysis, confocal microscopy, DNA sequencing

RELEVANT EXPERIENCE

Boston University Growth Factor Mechanobiology Lab Boston, MA
Undergraduate Research Assistant October 2021 - December 2022

- Modeled tunable early osteoarthritis in bovine cartilage using culture media manipulation and Raman spectroscopy indicating accurate prediction of 75% of changes in tissue composition
- Measured tissue properties in human tissue engineering constructs utilizing Raman spectroscopy indicating ability to measure properties with 86% accuracy
- Collaborated on abstract accepted for presentation at Orthopedic Research Society conference

BU College of Engineering Boston, MA
Learning Assistant January 2021 - December 2021

- Guided engineering mechanics class of 40 students through course material during group work and office hours

Hunter College Brazill Laboratory Manhattan, NY
Research Assistant July 2017 - August 2018

- Identified relative pathway interaction of two motility associated proteins using starvation development assays, cell sorting imaging, cell substrate adhesion assays, and endocytosis assays in *Dictyostelium discoideum* model

SELECT PROJECTS

Mouse Tendon Bioreactor September 2022 - present

- Developed mice tendon bioreactor able to match commercially available products with 95% confidence
- Coded Matlab app to track cell and nucleus location across images to calculate strain transfer

Molecular Biology Paper Review November - December 2022

- Reviewed and presented previously published work on engineering synthetic morphogen systems

Pet Classifier November - December 2021

- Utilized machine learning to create a classifier able to distinguish between images of cats and dogs with 90% confidence

Pulse Oximeter September - December 2020

- Designed and prototyped working pulse oximeter for hospital use in identifying potential COVID patients

MATLAB Final Project April 2020

- Analyzed 1,000 plus entry data set of early COVID 19 cases and deaths to analyze effective response strategies

LEADERSHIP

Technology and Innovation Scholars Program Ambassador September 2021 - present

- Built and guided K-12 students in weekly activities to teach engineering basics and promote student interest

BU International Affairs Association January 2021 - present

- Organize and facilitate debate for thirty person committees at collegiate and high school model UN conferences

Miguel Mazumder

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EDUCATION

Boston University, College of Engineering, Boston, MA

Bachelor of Science in Biomedical Engineering with a concentration in Machine Learning *Expected May 2023*

SKILLS

Programming: MATLAB (4 Years), Python (3 Years), R (2 Years), Arduino (2 years), Stella Architect (1 Year), C++ (1 Year)

Languages: English (Native proficiency), Portuguese (Professional working proficiency: reading, writing)

WORK EXPERIENCE

Undergraduate Research Assistant, Medical Department Boston University - Johnson Lab, *Jan 2021 - Aug 2022*

- Conducted research of correlation between gut microbiome and prostate cancer inflammation under faculty instruction
- Performed PCA and statistical analysis on Tuberculosis and gut microbiome project to identify biomarkers using RNA-seq data and metadata
- Managed lab operations by submitting scripts to Boston University Shared Computing Cluster (SCC)

Research Volunteer, Virginia Military Institute - Economics and Business , *Feb 2020 - Nov 2021*

- Developed MATLAB code and documentation for SARS-CoV-2 infection simulation and analyzed factors affecting infection rate
- Implemented game theory strategies, generational simulations, and SARS-CoV-2 epidemiology to provide information on how distance, sanitization, and other factors influence infection rate of Coronavirus over varying periods of time
- Ensured accurate and timely coding and documentation with faculty mentor

Quantitative Research Analyst Volunteer, George Washington University - GW Cancer Center *May 2019 - Aug 2021*

- Directed and trained a team of students for weekly presentations and research of gut microbiome
- Performed literature review, curated data and predictive analytics on organisms found in normal human gastrointestinal tracts
- Developed algorithm for *in silico* microbiome data using MatLab and applied machine learning to optimize glycan image analysis

Medical Oncology Research Intern, Georgetown University *May 2018 - Sep 2018*

- Researched application of immunotherapy and success rate of late stage bladder cancer patients utilizing gene expression data (RNA-seq)
- Acquired proficiency in G-DOC and CIBERSORT to generate heatmaps and other figures of cancer vs. normal gene expression data and presented summary results at end of internship

PROJECTS

George Washington University GW Cancer Center: PCA analysis and K-clustering of patient data

Led development of backend generative adversarial networks and variational autoencoders, two machine learning techniques, to generate synthetic data on epilepsy patients based on real patient data. Synthetic data allows for more patient data to determine the relationship between the human gut microbiome and diseases, as it is an emerging field. By exploring how the microbiome and diseases interact, valuable conclusions for early detection and prognosis of conditions can lead to more effective treatments for patients. Contributed to implementation of backend to an early design of a front end webpage for patient user use. Project funded by the Department Of Veterans Affairs.

Boston University Undergraduate Research Program (UROP): RNA seq analysis and Supercomputer Cluster

Determined bacterial expression present in patients with tuberculosis. Applications involved personalized medicine: altering prognosis and treatment of patients with initial macrophage response, immune control, or lung cavitation. Required comprehension of NGS data and bioinformatics framework to process and analyze data sequenced from patient studies. Proficiency of Pathoscope and Telescope (bioinformatic frameworks) as well as writing shell scripts to process data on Boston University SCC (Shared Computing Cluster).

Biomedical Engineering Senior Project: Optogenetics Wilson Wong Lab

Current project is developing an optical system to produce illumination patterns on split recombinases to create light-responsive genetic switches. Tasks can be broken down into three specific deliverables of i) design formulation of an optical hardware system ii) GUI software to optimize specific spatial illumination patterns iii) Data analysis for optimization of prototyping. This project also involved learning synthetic biology techniques (e.g. DNA transfection, cell culture) as well as microscopy and quantitative image analysis. Spearheaded the design and development of the GUI software, pipeline for data quantification of GFP, flow cytometry, and TRITC data, and performance analysis of wet lab experiments.

Amber McBorrough

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EDUCATION

Boston University College of Engineering *Boston, MA*
B.S. in Biomedical Engineering *Expected December 2023*
Relevant Coursework: Medical Imaging, Instrumentation, Cell Biology, Statistics, Thermodynamics

RELEVANT INTERNSHIP EXPERIENCE

Pfizer, Andover, MA – Biotech/Operational Excellence Intern *August 2022*

- Synthesized, analyzed, and created visual depictions of aggregated data related to lost time, external losses, and causing areas for 3 Supply Chain departments to improve efficiency
- Generated and delivered training sessions to teach 5 team members how to build and use pivot tables for lost time analysis, resulting in an increase in overall team productivity
- Performed three Lean Six Sigma investigations (Method 1) within the Supply Chain department to reduce variability, eliminate waste, and create a safer working environment

Tech for Change Hackathon, Boston, MA – Operations Lead *February 2023*

- Organized the 24-hour Civic Technology Hackathon for 150 students
- Developed and managed comprehensive project plan and agenda, ensuring team met weekly deliverables
- Recruited, and managed a team of students, mentors, and judges
- Coordinated logistics and operations of the Hackathon ceremonies and workshops

PROJECTS

Senior Design – Predictive Model for Alzheimer's Disease *May 2023*

- Constructing data driven predictive machine learning models for Alzheimer's Disease using MATLAB
- Employed machine learning models such as support vector machines and decision trees that generated a misclassification rate of 5%
- Led data preprocessing and data separation (training and testing datasets) to ensure accurate predictions
- Conducted extensive literature review on biomarkers and its effectiveness in predicting treatment success

Technology Startup Project *December 2022*

- Created business model for startup for 24/7 monitoring and evaluation of user's neurological health
- Directed market research, financial forecast, and high-level overview of product idea
- Presented business model to a group of collogues and venture capitalists

Portable Medication Preservation Device *December 2021*

- Developed device that alerts user if temperature or humidity of medication goes outside of a predetermined range by programming and wiring an Arduino Nano and other electrical components
- Designed physical container using an insulated cup and acrylic strips to maximize stability, efficacy, and functionality

Community Health Assessment (CHA)

- Created CHA to analyze patterns of substandard housing and health risks in farm-working communities
- Developed a root cause analysis, high level overview, primary and secondary data collection tools, community engagement and dissemination strategies

Additional Projects: Truss Project, Pulse Oximeter, Machine Learning Data Classification, Device Design

LEADERSHIP & ACTIVITIES

Associate Consultant – Boston University Consulting Group *February 2023*
Senator – Boston University National Society of Black Engineers *May 2022*
Mentor and Tutor –Technology Innovation Scholars *September 2021*

SKILLS

Signal Processing, MATLAB, C, Arduino, Microsoft Office, Lean Six Sigma, Data Analysis, Strategy Consulting

Ananya Mehta

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EDUCATION

Boston University, College of Engineering Boston, MA
Bachelor of Science in Biomedical Engineering Expected May 2023

WORK EXPERIENCE

Enterey: Life Sciences Consulting Irvine, CA
Intern Consultant June 2022 - August 2022
Critical Thinking: Utilized CT MOD channel to create conditional formulas for the documentation timeline and integration of the C&Q schedule for Bayer Pharmaceutical
Problem Solving: Reconstructed the operations readiness dashboard on Smartsheet for the production workstream team, deployed SOPs and documentation to maintain request logs for SOPs, formulated current holder reports for documentation (Bayer Pharmaceutical)
Communication: Led all Bayer Team meetings, attended by 30+ Bayer employees, presented the production dashboard to Bayer's team
Data Analysis: Evaluated process street and Smartsheet to determine the best home system for Enterey policies, procedures, SOPs, training and onboarding
Leadership: Assembled a pilot for training new hires on Smartsheet and process street, including an in-depth systems analysis, capabilities assessment and cost-benefit analysis, presented solutions to C-level executives

SafeStamp San Diego, CA
Research Analyst June 2021 - August 2021
Pharmaceutical Business Development: Increased potential clients awareness to combat loss of market share to counterfeit drugs, built business partnerships estimated to decrease pharmaceutical companies' costs by 8%
End User Education: Conducted target-based market research to maximize results of leading product in various countries, contacted potential customers and secured 6 letter of intents to buy the nanotech product upon market launch
Report Writing: Wrote research articles to showcase our product's capabilities in providing assurance against fake drugs

RESEARCH EXPERIENCE

Albro Lab, Boston University Boston, MA
Growth Factor Transport Modeling Research Analyst December 2021 - June 2022
Created model simulations for drug release from biomaterial matrices using Comsol Multiphysics 5.6
Developed computational models describing delivery of key anabolic growth factors during the development of engineered musculoskeletal tissues, optimized growth factor delivery strategies to allow for sufficient ECM biosynthesis during development while mitigating pathogenic effects of excessive growth factor activities currently plaguing regenerative medicine platforms

Kolachalama Lab, Boston University Medical Campus
Boston, MA **Computational Research Analyst** November 2020 - October 2021
Collaborated with Vijaya Kolachalama on Drug-Coated Balloon therapy for cardiovascular diseases to replace stent surgery, administered research to understand how different drugs stick onto balloons and transfer to the target site when the balloon is inflated inside the cardiovascular system, created tools that help analyze videos and images of different drugs undergoing compression to understand their interfacial failure
Constructed a Fast Fourier Transformation 2 and applied Gabor filters, signal processing and machine learning by modeling the interfacial failure of different drugs, discovered drug combination to be most effective coating on the balloon

RELEVANT COURSEWORK & LAB WORK

Principles of Molecular Biology and Biotechnology (BE209)
Executed experiments such as genotyping with qPCR, worked with restriction enzymes and plasmid isolation
Biomedical Measurements (BE491)
Programmed low and high pass filter by Arduino sensor, studied signal processing in the frequency domain for programming
Introduction to Drug Delivery (**EK 131)**
Conducted in-depth research with Stella Architect on Amphetamine to compile related pharmacokinetics and analyze effective therapeutic management for patients, built a one-compartment model to track the concentration of the amphetamine in the plasma and simulated the pharmacokinetics of repeated oral dosages, proposed Adderall patches and biodegradable spheres as replacements

ADDITIONAL SKILLS, CLUBS & VOLUNTEER EXPERIENCE

Technical Skills: C++ , SQL, MATLAB, C#, Python, Stella Architect, Comsol Multiphysics 5.6
Academic and Professional Clubs: Society of Women Engineers, Gamma Phi Beta, Dean's List '22

Mia Metni

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EDUCATION

Boston University Boston, MA, **Fall 2023**
Degree: B.S. in Biomedical Engineering
Relevant Coursework: Optical Spectroscopic Imaging, Business Technology Innovation, Fundamental Fluid Mechanics, Solid Biomechanics, Material Science, Principles of Cellular Molecular Biology, Systems Physiology, Electrical Circuits, Signals and Controls, Biomedical Measurements I & II, Probability Statistics, Thermodynamics

PROJECTS

Boston University Senior Capstone Research And Design Project Boston, MA, **Current**
Johnson & Johnson
- Investigating manufacturing process of nanoscale surface topology coatings on titanium substrate
- Designing experimentation and learning SEM imaging techniques to evaluate bactericidal effectiveness of nanostructures

Infrared Sensor for Non-Invasive Thermoregulation Boston, MA, **Current**
- Designing and developing advanced penetration IR technology for non-invasive thermoregulation focusing on optical spectroscopic imaging techniques
- Novel methodology addresses the critical need to reduce the rate of incidence of phrenic nerve injury

Diaphragmatic Automated Response Tracker Boston, MA, **Fall 2022**
- Designed, produced, and tested a device that aids in the inhibition of phrenic nerve injuries observed during invasive procedures
- Utilized accelerometry to monitor diaphragmatic excursion via palpation

Commercial Pulse Oximeter Boston, MA, **May 2021**
- Used SolidWorks and Arduino for functional prototype of the commercial pulse oximeter

Innovate@Bu Sponsored Research Boston, MA, **Sep 2020 – Aug 2022**
- Developed sustainable filament (CFRP) for 3D printing and electrochemical method for recycling said filament

First Year Engineering Innovation Fellowship Boston, MA, **Sep 2019 – Aug 2020**
- Designed a biocompatible filament for market players' with ESG-objectives

PROFESSIONAL EXPERIENCE

Digital, Technological, And Business Consultant Intern New York, NY**, Jun 2022 – Aug 2022**
Capco
- Worked with a Tier II Investment Bank, observing the mitigation and retirement of digital elements and the transfer of data from CRM platforms under Capco's software development team
- Designed Capco a for-client-use playbook on ESG-centric investing

Wealth Management Intern Houston, TX, **Jun 2021- Jul 2021**
Ameriprise Financial
- Assisted in development of financial plans for over 900 firm clients with more than $1 billion in assets under management
- Developed effective advertisements and client outreach under marketing specialist; Analyzed benefit and social security payments; Improved virtual engagement with clients with client-centric brochure on Medicare

E-Commerce And Retail Business Owner Boston, MA, **Feb 2020 – May 2022**
Depop
- Generated high profit margins while maintaining low operating costs
- Re-introduced pre-existing products back into the supply chain, sustainably sourcing from waste streams
- Ranked and verified as a top seller (out of 21+million users on Depop) for 18 months

Red Cross Certified Water Safety Instructor Austin, TX, **Summer 2019**
Red Cross @ Austin Jewish Community Center

ORGANIZATIONS

Order of the Engineer, BU College of Engineering chapter member @ Boston University **Present**
Greek Life Diversity And Equity Committee, Board Member @ Boston University **Sep 2020 – Present**
Off The Cuff Magazine, Stylist @ Boston University **Sep 2021 – Present**
Innovate@BU, First Year Engineering Innovation Fellow @ Boston University **Sep 2019 – Aug 2020**

Johnathan Nicholas Lewis Muhvich

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EDUCATION

Boston University: College of Engineering Expected May 2023
Major: Biomedical Engineering, Bachelor of Science | *GPA: 3.59*
Relevant Courses: BE451 Biomechanics of Lung Ventilation, BE511 Biomedical Instrumentation
Selected Awards Distinguished Summer Research Fellowship, Deans List for two consecutive semesters
Leadership Positions: Resident assistant, Lab Assistant manager, Project Lead, Equipment Manager
Skills: *Coding languages*: C, MATLAB, LabVIEW *3D Modeling Software:* Solidworks, 3D slicing Software
Hard skills: Lathe, NC Mill, CNC Mill, Hand tools, 3D Printing, Wood Working, Metal Working, etc.
Interests: Device Design, Neurology, Motorcycling, Traveling, Electronic Sensors, Coding

WORK EXPERIENCE

Boston University College of Engineering: Nia Laboratory
Project Lead – Mouse/Pig Ventilation November 2021 - Present

- Invented a novel ventilator, leading a team of 5 in all aspects of development, and testing, over 8 months
- Conceived of innovative techniques for negative ventilation, tailored for keeping respiration dynamic curves within 10% of spontaneous breathing according to pressure, flow, and volume metrics
- Implemented open source and cost-effective materials to keep costs below $400, to ensure adoption is feasible for any lab or research team

Undergraduate Researcher June 2021 - Present

- Designed, constructed, and prototyped ~6 experimental setups in co-ordination with Graduate Students
- Modeled parts for 3-D printing at extreme resolutions of 50 microns
- Preformed tracheotomy on frozen mice to learn surgery basics and mouse anatomy for 2 months
- Created in house solutions to complex problems, such as conceptualizing a novel ECG machine for a mouse to allow for detailed measurement of heart beats using low-cost materials under $100

Boston University College of Engineering: Binoy K. Singh Imagineering Laboratory (SILab)
Assistant Manager February 2021 - Present

- Oversaw SILab's hiring process and expansion from 4 to 11 lab advisors, thereby allowing SILab to host more events, accommodate more students, and expand SILab's knowledge base
- Managed 11 lab advisors on safety, manufacturing, and people skills to ensure a safe and effective working environment for SILab's 500+ trained students
- Increased student use of Singh Imagineering Lab during COVID-19 by 300%
- Hosted multiple Lutron Lighting competitions to provide over 60 students with an industry-lead challenge

Equipment Manager January 2021 - Present

- Conducted and repairs on 8 major equipment pieces (lathe, band saw, planar, miter saw, NC mill, and 3D printers)
- Facilitated weekly ordering for new stock and machines, to maintain and enhance lab capabilities by expanding accepted materials to include steel, carbon fiber, and other more exotic materials
- Conceptualized and executed a comprehensive maintenance plan for machines to prevent and detect future breakdowns. Has been in use for 18 months, without any major machine failures

SELECTED PROJECTS

Novel Device for Mouse Ventilation

- Positive and negative ventilation device for use in mice or pig lung surgeries, as well as ex vivo experiments, with initial trials involved 3 separate trials against commercial ventilators and spontaneous breathing
- Device allows for 2 completely novel ventilation features: negative and positive ventilation in one platform, can mimic physiological breathing curves, can mimic coughing spells

Piezo Stimulation of Calcium Channels

- Built and troubleshot a piezo electric device for investigating mechanically mediated calcium signaling in cells. Initial prototype was made in 1 week, with further testing and development lasting 1 month
- Piezo chamber has 2 potential applications in stimulating bone growth, and exploring calcium signaling in cells

Thomas Murillo

tmurillo@bu.edu | (203) 822-4021 | Boston, MA | linkedin.com/in/thomasmurillo/

Education

Boston University College of Engineering — Boston, MA
Bachelor of Science in Biomedical Engineering, Concentration in Technology Innovation — May 2023
GPA 3.26/4.00

Skills

Computer/Manufacturing: MATLAB, Solid Works CAD, Arduino Coding/Building, 3D Printing, Microsoft Office
Laboratory: ImageJ, GraphPad Prism, LabView, Microplate Spectrophotometry, ELISA, Animal Dissection

Professional Experience

Massachusetts Lions Eye Research Laboratory, BU Medical Campus — Boston, MA
Research Assistant — August 2022

- Created a MATLAB program to analyze mouse retinal ganglion cell layer survival
- Conducted experiments to determine the presence of innate immune memory in macrophages
- Learned mouse retinal dissection to create conditioned media for ELISA experiments
- Collected data into GraphPad Prism and found statistical significance in my research

Chemistry Department, Boston University — Boston, MA
Laboratory Assistant — August 2021

- Conducted daily lab sessions that developed laboratory discipline and interpersonal skills
- Assisted students with various issues during lab sessions such as chemical spills and refills
- Ensured proper chemical concentrations within lab storage to promote safety for students

People's United Bank, N.A. Headquarters — Bridgeport, CT
Information and Technology Intern — August 2019

Projects

Senior Project: "Soft Robotics for Hand Rehabilitation," *BU Morphable Biorobotics Lab* — May 2023

- Designed a portable glove for rehabilitation using magnetorheological fluid and electro-permanent magnets

Storage Application — May 2022

- Served as chief marketing officer for an innovative technology product
- Created and presented an actionable 5-year business plan
- Conducted current market research to scope product practicality and profitability

Pulse Oximeter Design — May 2021

- Designed and constructed a portable pulse oximeter using an Arduino Nano and photoresistors
- Calibrated the device by collecting data from volunteers to ensure output precision
- Built a plastic lightweight casing to block ambient light and installed a professional display for users

Additional Projects: Truss Design, Assistive Hand Gripping Device for Arthritis Patients, Visual-Tactile Physiology Experiment, Arduino High/Low Pass Signal Filtering Program

Leadership and Affiliations

Pi Kappa Alpha Fraternity Member — May 2021

Assistant Athletics Equipment Manager — May 2021

Biomedical Engineering Society at BU Member — October 2019

BU Club Rugby Social Chairman and Executive Board Member — November 2018

Owen Murray

617-835-8149 223 Savin Hill Ave., Boston, MA 02125 owstr@bu.edu

EDUCATION

Boston University - *Boston, MA,* 4th year Biomedical Engineer Major — May 2023

Trinity College Dublin - *Dublin, Ireland* — Fall 2021

Boston Latin School – *Boston, MA*, — May 2019

SKILLS

- MATLAB and R Coding skills, Circuitry skills, Hardware assembly & Soldering, Mechanical Systems Experience, Engine Repair, Spanish. Large scale Data analysis and multi-source interpretation.

WORK EXPERIENCE

Mass Biologics – Engineering intern, *Boston, MA* — Summer 2021

- Worked as an Engineering intern with Systems Engineering team.
- Supported Mass Biologics biotech facilities which are used in the development and manufacture of vaccines specifically a successful tetanus diphtheria vaccine.
- Identified functional biomedical equipment by working with supply chain and research teams.
- Organized inventory and executed two engineering projects focusing on company efficiency, including creating an inventory catalog for the company as well as personnel locator map.

PROJECTS COMPLETED

Bioinformatics Software — Fall 2022 – Spring 2023

- Generated bioinformatics tools in R studio such as heatmaps, Venn diagrams and dot plots by combining proteomic and transcriptomic data sets.
- Developed a user friendly data analysis pipeline using R shiny app for C4Therapuetics (a Boston based biotech) which can receive diverse data sets and produce visualization tools at the users request.

Continuous Glucose Monitor Watch — Spring 2021

- Went through the design process for medical devices by creating an athletic sports band, designed for diabetic athletes. The function of the band was to monitor athletes blood sugar while playing sports.
- The product could display blood sugar ranges on an athletic band, via blue tooth data inputs.

Arctic Ocean carbon storage Data Analysis, — Spring 2020

- Analyzed multi-dimensional data from NOAA to estimate the effectiveness of the artic carbon sink.
- Created coherent graphs and metrics using Excel to convey that CO2 sequestration will likely increase in the coming decades even as the ice continues to melt.

Pulse Oximeter — Fall 2020

- Developed a functioning pulse oximeter to measure the blood oxygen levels and heart rate for potential coronavirus patients. This was accomplished using an Arduino microcontroller and other circuitry.

AWARDS AND HONORS

Division 1 Athlete — 2019-2021

- I was a member of the Boston University Men's Soccer Team

Boston University Community Service Award — 2019-2023

Junny Myung

junnym@bu.edu • (617) 840-9782 • www.linkedin.com/in/junny-myung

EDUCATION

Major: Biomedical Engineering

Candidate for Bachelor of Science in Boston University College of Engineering Boston, Massachusetts
Expected May 2023

Relevant Coursework: Transfer Phenomena in Living Systems, Probability & Statistics in Machine Learning, Quantitative Neuroscience, Systems Physiology, Fundamentals of Electric Circuits, Photonics, Biomedical Measurements, Optical Microscopy of Biological Materials, Clinical Applications of Biomedical Design

RELEVANT EXPERIENCE

Research Assistant Sep 2021 – Jan 2023
Boston University Bio-Imaging & Informatics Lab Boston, Massachusetts

- Developed a better automatic computer-aided diagnosis (CAD) system for early detection of Alzheimer's disease (AD) based on supervised machine learning methods
- Analyzed the fMRI QA/QC data and classify stages of AD based on applying ATN methods using MRI, CSF biomarkers data
- Provided statistical analysis of HCP Pipelines correlation data with MATLAB
- Evaluated literature and present research articles through weekly presentations

Medical Laboratory Assistant June 2020 – May 2023
SCH SIMs (Soon Chun Hyang Institute of Medi-Bio science) Lab Seoul, South Korea

- Aim to reveal the post-transcription regulation network by systematically studying gene expression of complexes, with specific post-transcription regulation capabilities, between non-coding RNA and RNA binding proteins
- Work under early-embryotic stage transcription subgroup and perform bioinformatics analysis of the RNA using BLAST, JPred, PSIPRED, and SWISS-MODEL
- Organize experiment result using Excel and SQL, perform data analysis using MATLAB, and make a final data comparison report

PROJECTS

Senior Design: 40 Hz Stimulation in Cognitive Performance Enhancement Sep 2022 – May 2023

- Administer a cognitive task with/without 40 Hz light and sound stimulation and investigate the 40 Hz gamma light therapy in the enhancement of brain cognitive ability to treat patients suffering neurodegenerative diseases such as ADHD and AD using an iPad App "AlzLife"

Engineering Design: Portable electronic mouse trap, obstacle detector and alarm for blind

- Designed a remote-controlled model of portable motion detector
- Utilized engineering design process to meet client's demands and design and construct prototype

SKILLS

Computer: MATLAB, Python, SQL, R (basic), Arduino, Microsoft (Outlook, Excel, Word), FIJI/ImageJ, CAD
Lab: Optical Microscopy, Photobleaching, DIC, Fluorescence imaging, Non-fluorescence imaging, FRET, TIRF, Confocal, DNA sequencing, Circuit Design, BLAST, JPred, PSIPRED, and SWISS-MODEL
Language skills: Korean (native), English (proficient), Chinese (Intermediate / HSK 5), Japanese (JLPT 1)

LEADERSHIP AND ACTIVITIES

Commissioner, Student Government Judicial Branch Sep 2019 – May 2021

- Maintain guidelines surrounding candidates' campaign processes and execute a fair election for undergraduate student body of more than 16,000 students
- Collaborate with the Intercollegiate Student Government in Boston and host common-ground social events with university-wide clubs and inviting guest speakers for wider Boston community

CGS Incoming Freshman Mentorship Program Leader, College of General Studies Sep 2019 - Jan 2021

- Direct students to resources to online resources regarding both academic planning and mental wellbeing
- Mentor incoming freshman on time management and academic success, and monthly workshops

Member, Biomedical Engineering Society

Anh Duy Nguyen

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(412) 330-0912

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Education

Boston University College of Engineering — **Boston, MA**
Bachelor of Science in Biomedical Engineering — Expected: May 2023
GPA: 3.90/4.00 | Dean's List | Summa Cum Laude

Work/Project Experience

Chaikof Lab of Harvard Medical School and Beth Israel — **Boston, MA**
Biomedical Engineering Senior Project – Design of a TEBV Bio fabrication Platform — September 2022 – Present

- Redesigned existing bio fabrication platform improving reliability, efficiency, and uniformity using established parameters for high throughput research purposes
    - Group of four undergraduate biomedical engineering students
- Produced novel blood vessel grafts by modulating fabrication parameters, testing for materials organization, bulk mechanical properties, and vascular cell distribution

Hamilton Lab of Boston University Medical Campus — **Boston, MA**
Undergraduate Research Assistant — September 2020 – Present

- Prepared samples of differing compositions of fatty acids for centrifuging, sonication and NMR analysis
- Analyzed NMR spectra of fatty acid samples to understand how fatty acid composition affects diffusion across blood-brain barrier
- Co-authored journals discussing research findings and grants for funding of future potential projects

MITES Semester of Massachusetts Institute of Technology — **Boston, MA**
Program Facilitator — February 2023 – Present

- Mentor staff and students about navigating MITES Semester program
- Organize and lead meetings to ensure staff is performing tasks efficiently
- Plan and lead college and life preparation events for students

Online Facilitator — June 2022 – January 2023

- Mentored and lead group of twelve underprivileged high school seniors across nation in high school academics, college application preparation and career preparation

Phrenic Nerve Monitoring Device — **Boston, MA**
Device Diagnostics and Design — September 2022 – December 2022

- Conducted interviews with stakeholders including clinical specialists and physicians to identify a device need in surgery
- Designed, programmed in C++, tested a functioning device to inhibit phrenic nerve injury during Cryoablation procedures and presented start-up pitch deck to class

Skills and Relevant Coursework

MATLAB | Python | Arduino IDE | C | VS Code | Solidworks | CAD | Excel | MS Office Suite | Data Science
Thermodynamics | Signals | Statistics | Biomedical Design | Organic Chemistry | Physiology | Biochemistry

KELTON NGUYEN

kelton.p.nguyen@gmail.com | 339-987-7510 | Boston, MA | linkedin.com/in/kelton-nguyen/

EDUCATION

Boston University, College of Engineering, Boston, MA — Expected May 2023
Bachelor of Science, Biomedical Engineering
GPA: 3.94
Honors: Dean's List all Semesters
Relevant Course Work: Molecular Bioengineering, Quantitative Microbiology, Principles of Fluid Mechanics, Biomedical Design and Diagnostics, Biomedical Signals and Controls, Logic Design

LAB EXPERIENCE

Boston University Khalil Lab — Feb 2022 – Present
Undergraduate Researcher

- Designed and executed an experiment testing split intein proteins integrated into synthetic zinc finger transcription factors in mammalian cells for potential therapeutic and imaging usage
- Cultured HEK293 cells for production of lentiviral vectors and performed viral transfection on Jurkat T-Cells to assess control of gene expression with dosages of orthogonal small molecule drugs
- Collected and analyzed flow cytometry data to validate potential for synthetic AND gate in mammalian cells

WORK EXPERIENCE

Born Global Foundation, Portland, ME — May 2020 – Aug 2020
Sustainability Innovation Intern

- Researched solar energy technologies with a team of 6 engineers to plan capable of generating 20x more power than conventional solar panels by integrating diatom algae and a tree-inspired configuration
- Coordinated with 127 interns from around the globe in developing a circular, zero-waste solar, aquaculture, and biochar model

PROJECTS

Painless Microneedle Anemia Diagnostic, Synthera Health — Sep 2022 – Present

- Devised and constructed a painless microneedle array-based testing kit for painless extraction of blood samples for point of care iron deficiency anemia diagnosis
- Created more representative testing methodologies for validation and quantification of test penetration and fluid uptake through an original finger model design

Dialyshield Project — Jan 2022 – May 2022

- Designed, prototyped, and tested a shield preventing contamination of dialysis catheter ports to reduce infection rates in patients for potential mass-production for clinical settings
- Employed a human-centered design process and rapid prototyping in a team of 5 conducting interviews with patients, clinicians, and doctors and conducting over 40 trials with volunteers

Image Analysis Project — Sep 2021 – Dec 2021

- Utilized MATLAB to manipulate images in the frequency domain, applying high and low-pass filters
- Performed image registration of 171 frames using cross-correlation analysis of the images
- Wrote a blood cell counting algorithm capable of identifying both red and white blood cell counts from a sample

LEADERSHIP & ACTIVITIES

President, Society of Asian Scientists and Engineers (SASE), BU — Sep 2019 – Present
Captain, Boston University Kendo Association — Sep 2019 – Present
Judicial Board, Theta Tau Professional Engineering Fraternity, BU — Jan 2021 – Present
Member, Shufukai Kendo Club (Martial Arts, 3rd Dan) — Oct 2011 – Present

SKILLS

Wet Lab: Plasmid Design, PCR primer design, qPCR, Gibson Assembly, Molecular Cloning, DNA Miniprep, Mammalian Cell Culture, Flow Cytometry, Lentivirus Production
Computer: MATLAB, Python, SolidWorks, Microsoft Office, Google Suite

Minh Nguyen

minhtn@bu.edu | 657-334-5868 | Boston, MA | linkedin.com/in/minhtn18/

Education

Boston University College of Engineering Boston, MA
B.S in Biomedical Engineering, Concentration in Nanotechnology Expected May 2023

Skills

Languages: MATLAB, Python, C++, R, Arduino
Applications: Microsoft Office, Visual Studio, Arduino, OceanView, LabVIEW, ImageJ, SolidWorks
Laboratory: FTIR, TEM, SEM, Micropipetting, Tissue Plating, Plasmid Isolation, qPCR Genotyping, Thin Layer Chromatography, EMG Recording, Data Analysis
Engineering: Prototyping, Device Modeling, FMEA, Pugh Chart, VPC, Image Processing, Statistical Analysis

Projects

Smartphone Based Jaundice Detection, Senior Design Project Sep 2022 - Present
- Collaborated in a team of 4 to identify methods for quantifying transcutaneous bilirubin levels with a prioritized list of benefits and disadvantages of each approach.
- Created phantom that mimics optical properties of human sclera to aid with testing prototype app.
- Programmed and tested a smartphone camera app to detect and monitor jaundice in newborns, with 85% accuracy compared to commercial devices.
- Documented results and organized into reports for presentation to professors and peers.

Limb Length Discrepancy (LLD) Diagnostic Device Sep 2022 - Dec 2022
- Led a team of 5 to come up with a cost-efficient and accessible way to diagnose LLD.
- Analyzed feasibility of ideas through business analytic tests such as VPC, Pugh Chart and FMEA.
- Conducted interviews with doctors and industry professionals to get insights on design specifications.
- Proposed 5 CAD designs and finalized on a 3D printed shoe-like wearable prototype with 95% accuracy.

Adhesive Gel Testing For Mouse Lung Tissue Plating, Suki Lab June 2022 - Sep 2022
- Utilized 3D printing and injection molding to build customized 6-well plates with interchangeable silicon membranes.
- Tested NUSIL, PEG hydrogel and PeriAcryl and mouse lung tissue on silicon membrane with 1Hz, 5% strain sinusoidal stretching for varying hours on a mechanical stretcher to simulate lung movements.
- Presented results in weekly lab meetings to supervisors and peers.

Computational Modeling of Cell Circuit, Suki Lab June 2021 - Jan 2022
- Developed mathematical model of myofibroblast- macrophages cell circuit in the ECM.
- Applied computational model on a virtual network to further determine behavior of cells circuit with different agents and visualized effect of agents over time on a hexagonal computation replication ECM.

Experiences

Research Assistant, Suki Lab June 2021 - Present
- Performed experiment on mice lung slices to examine effect of stress-strain on collagen digestion.
- Measured waviness of individual fibrils from collagen fibers to study single fiber force-extension.
- Calibrated 6-well stretchers to examine mouse lung slices in different stretch conditions.
- Performed mechanical and computation analysis to test NUSIL sticky gel and PEG-based hydrogel on silicon membrane to use in 6-well stretchers.
- Developed lab protocols and procedures to ensure hygiene, safety and coherence.

PAYTON O'CONNOR

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EDUCATION

Boston University *Expected May 2023*
Bachelor of Science: Biomedical Engineering, GPA: 3.4
Minor: Visual Arts, GPA: 3.9
Relevant Coursework: Introduction to Biomedical Material Science, Organic Chemistry I&II, Biochemistry I, Transport Phenomena in Living Systems, Clinical Applications of Biomedical Design, Introduction to Software Engineering

RESEARCH EXPERIENCE AND PROJECTS

Undergraduate Researcher *May 2022 — Present*
College of Engineering, Boston University, MA
Research Advisor: Dr. Timothy M. O'Shea, Assistant Professor of Engineering

In Situ Hydrating Polymer Coatings for Neural Devices *September 2022—Present*
Designed a self-hydrating, non-fouling polymer coating to increase implanted neural device longevity. Optimized polymer synthesis, solvent system, and industrial fabrication techniques for coating. Characterized polymer coating chemo-mechanical properties and evaluated biological interactions of the coating in simulated *in vivo* conditions.

Cellulose-Derived Hydrogels to Present Chemo-mechanical Stimuli for Glial Regulation *May 2022 — Present*
Synthesized hydroxyethyl cellulose-derived materials to present chemo-mechanical stimuli such as variation of stiffness, surface charge, and presentation of bioactive molecules for the regulation of glial responses *in vivo*.

Trehalose-Guanosine Glycopolymer Hydrogels *June 2022 — November 2022*
Engineered trehalose-guanosine copolymers to form hydrogels to regulate glial interactions in the central nervous system. Evaluated glycopolymer synthesis, hydrogel forming capacity, and regulation of glial responses after injection of the material. Glycopolymer materials that demonstrated clear glial regulation were tested in murine models of ischemic stroke and benchmarked against methylcellulose, a gold standard biomaterial.

SKILLS

Laboratory Techniques: Rheology, Goniometry, Fourier Transform Infrared Spectroscopy (FTIR), Dynamic Light Scattering (DLS), Surface Tensiometry, Tensile Testing (Instron), Fluorescent Microscopy, Raman Microscopy, Differential Scanning Calorimetry (DSC), Thermogravimetric Analysis (TGA), Immunocytochemistry and Immunohistochemistry Techniques, Experimental Design
Software and Programming Languages: Microsoft Office, Adobe Illustrator, Adobe InDesign, Adobe XD, ImageJ, ChemDraw Professional, GraphPad Prism, MestreNova, MATLAB, C, C++, Python

PUBLICATIONS

DuBois, EM; Adewumi, HO; **O'Connor, PR**; Labovitz, JE; O'Shea, TM. Trehalose-guanosine glycopolymer hydrogels regulate adaptive glia responses in CNS injury. *Advanced Healthcare Materials*. (In Submission).

WORK AND LEADERSHIP EXPERIENCE

Peer Tutor Mentor *September 2022 — Present*
Educational Resource Center, Boston University, MA
Trained, observed, and mentored a group ~100 peer tutors and aided in administrative work while continuing to hold tutoring appointments

Peer Tutor (General Chemistry I&II) *October 2021 — Present*
Educational Resource Center, Boston University, MA
Developed tailored sessions and study plans to address specific questions and problem areas for individual tutees in both one-on-one and group settings, completed 150+ appointments to date

Technology Innovation Scholars Program *October 2021 — May 2022*
College of Engineering, Boston University, MA
Led high schoolers through engineering design challenge and educate about the role of engineers in daily life

Learning Assistant (General Chemistry I&II) *September 2020 — May 2021*
College of Arts and Sciences, Boston University, MA
Led weekly discussion sections, presented practice problems in a lecture of ~100 students twice weekly, and hosted office hours and review sessions to provide extra support to students

Nicole Ostrovsky

nostrov@bu.edu | (978) 340-3068 | Boston, MA 01776 | www.linkedin.com/in/nicoleostrovsky/

EDUCATION

Boston University, **College of Engineering,** Boston, MA — Expected May 2023
Bachelor of Science in Biomedical Engineering

University of Massachusetts Amherst, College of Engineering, Amherst, MA — September 2019 - May 2020
Bachelor of Science in Biomedical Engineering, Dean's List

COURSEWORK

Thermodynamics, Tissue Engineering, Biomechanics, Biomaterials, Molecular Cell Biology, Signals and Controls**,** Physiology

WORK EXPERIENCE

Researcher
Boston University, Primary Investigator: Diane Joseph-McCarthy — May 2021 - Present

- Research on the development of COVID-19 prophylactics and early treatments in collaboration with Fractal Therapeutics, a drug development company
- Engineering cyclic peptides to block SARS-CoV-2 spike protein from binding to its receptor
- Implementing computational modeling and molecular docking, and using molecular dynamics software (including Chimera, PyMol, FTMap, Maestro, Glide, Desmond) for analysis of proteins
- Developed non-standard protein-protein docking protocol for cyclic peptides

BE428 Teaching Assistant
Boston University — January 2023 - May 2023

- Assisted lecture delivery and course organization in a device and diagnostics design class with 40 students

ACADEMIC PROJECTS

Computational Investigation of Peptide Docking to Fibrin for Molecular Imaging of Post-Surgical Abdominal Adhesions
Boston University, Primary Investigators: Joyce Wong, Diane Joseph-McCarthy — September 2022 - Present

- Defined specific aims, research strategy, expected outcomes, and timeline for project
- Engineered optimized peptides that bind to fibrin for molecular imaging of early post-surgical abdominal adhesions using computational modeling software
- Performed *in silico* protein-protein docking using Schrödinger's Glide docking software

BIOX 3D Printing Project — Spring 2021

- Created bioink for 3D printer and tested various printing parameters to find ideal printer specifications
- Printed small 3D shapes using developed bioink
- Wrote a research paper and presented results to a group of 20 people

SKILLS

Computer: MATLAB, Java, Schrödinger Software Package (Maestro, Glide), Chimera, PyMol, FTMap, Fusion 360, OnShape, MAC OS, some familiarity with UNIX
Laboratory: Experience with gel electrophoresis, qPCR, and chromatography, 3D bioprinting, Arduino circuit design
Languages: Russian

HONORS AND AWARDS

- Undergraduate Student Researcher Award (UROP) — Summer 2021, Fall 2021, Spring 2022, Summer 2022
- UROP poster presentation — Fall 2021, Fall 2022
- The Stanley Z. Koplik Certificate of Mastery Award — Fall 2019

Kevin M. Panaro

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EDUCATION

Boston University College of Engineering Boston, MA
B.S. in Biomedical Engineering, Concentration in Nanotechnology **May 2023**

RELEVANT COURSEWORK

Molecular Bioengineering	Introduction to Nanotechnology	Nanometer Scale Processes in Living Systems
Biomedical Signals & Controls	Thermodynamics & Statistical Mechanics	Transport Phenomenon in Living Systems

EXPERIENCE

Virtual Intern Summer 2021
Virtual Internship in Biomedical Engineering Worcester Polytechnic Institute

- Completed a virtual 8-week internship program consisting of professional development workshops & focus groups, which culminated in a design competition
- Fabricated an easy to produce, cheap to manufacture lead filtering device made out of household items using CAD software
- Presented on how two plastic buckets, a coffee filter, and a shower mesh can be assembled so contaminated water drains through a mesh lining into an empty cylinder

SELECTED PROJECTS

Senior Project: "Software Generation for Visual Analysis of Multiomic Data," *C4 Therapeutics*

- Architected a user-friendly Shiny application in RStudio to visualize correlation between mRNA transcript and protein fold changes after targeted protein degradation of cancer cells
- Merged R scripts into Shiny to allow user to input Excel files from their device, select desired columns, adjust cutoff values, and output chosen visualization(s) as a downloadable printout (heat map, dot plot, Venn diagram)
- Eliminated need for manual analysis by automating data compilation process, which provides C4T researchers a fuller picture of biological pathways responsible for observed phenotype after degradation

"Novel Tracking Method for Anti-Cancer Drug Delivery"

- Identified a novel technique to track delivery of anti-cancer drug doxorubicin (DOX) to regions of the cancer human colorectal carcinoma in vivo, which stands to improve diagnosis, treatment, and overall management
- Proposed that multiwalled carbon nanotubes containing drug can be modified with equatorial pyridine to attach iron oxide coated, gold nanoparticles
- Discussed how micro-CT cross section scans of computational operations measuring noise emitted by the particles could be employed to track success of nanotubes in neutralizing cancer

"Maximal Sustained Grip Strength by Gender"

- Conducted a scientific study measuring the effect of gender and time in a sustained grip strength test of one minute using ECG, a longer period than previous literature studies
- Found a statistically significant difference between initial and final grip strength for males versus females
- Irrespective of gender, found a statistically significant decrease in grip strength over 60 seconds

Additional Projects: Pulse Oximeter Device, Truss Design, Prosthetic Fabrication

SKILLS

Computer: Data Analysis, MATLAB, RStudio, CAD, Arduino IDE, Microsoft Office Suite
Laboratory: Microscopes, ECG, Pipetting, Spectrophotometers, Oscilloscopes

LEADERSHIP & ACTIVITIES

Vice President, Slow Children at Play Sketch Comedy
Vice President, Kol Echad A Cappella
Member, Biomedical Engineering Society

Nancy Leslie Perez

nlperez@bu.edu • (832) 889-4416 • Houston, Texas, 77092

EDUCATION

Boston University, Boston, MA — Expected May 2023
Bachelor of Science in Biomedical Engineering
GPA: 3.69/4.0, Cum Laude
Dean's List: Fall 2019, Fall 2021, Fall 2022
Relevant Coursework: Biomedical Engineering Senior Project | Quantitative Neuroscience | Clinical Applications of Biomedical Design | Introduction to Biomedical Optics | Transport Phenomena in Living Systems | Thermodynamics | Systems Physiology | Biomedical Measurements | Engineering Mechanics

EXPERIENCE

Mugar Memorial Library, Boston, MA — Sep 2019 - Present
Library Assistant

- Organizing, reshelving, shifting, and general maintenance of Library collection for 4 years for continual and functional use of library for students, professors, and staff to accurately obtain documents
- Preparing digital scans of ILL and Faculty of library materials to aid professors with course materials and/or projects and facilitate graduate students with research for 2 years

PetSmart- Mutts and Meows Rescue, Houston, TX — Apr 2019
Volunteer

- Cooperated in 10 dog and cat adoptions to ensure a safe home and quality of life
- Tended to 6 dogs to support a friendly environment for a higher chance of adoption
- Cleaned and arranged cages, supplies, and paperwork after adoption fair was finished to guarantee another future event and keep area in top conditions

PROJECTS

Multiplexed SNP Detection for Rapid Drug Resistance Analysis — Sep 2022 - Present

- Collaborated with a team of 3 to develop new chip designs, probe designs, and protocols for detection of resistant tuberculosis with use of iRiS Kinetics system to reduce bacterial resistance across the country

Pulse Oximeter Project — Jan - May 2021

- Generated a design for a pulse oximeter in a team of 3 to understand inherent flaws of commercial pulse oximeters
- Managed meeting schedules and achieved weekly deadlines in order to efficiently finish the product
- Revised and drafted script for data collection of pulse oximeter to certify readings were accurate and consistent for 80% of trials

Truss Project — Sep - Dec 2020

- Created truss analysis script in MATLAB for team of 3 to validate truss design and satisfy every requirement
- Assembled and constructed truss to test with 3 different loads to verify maximum loading capacity

Machine Learning Project — Nov - Dec 2019

- Proposed a project and solution focused on analyzing an extensive data set by using machine learning in MATLAB in a team of 2
- Developed meaningful data points reflecting relationship between GNI, private sector percentage, and life expectancy across different countries to determine environmental causes of life expectancy

SKILLS

Coding: Proficient in MATLAB
Languages: Basic Spanish, Fluent English

Alec Perliss

aperliss@bu.edu · 415 741-6530 · www.linkedin.com/in/alec-perliss · San Francisco, CA

EDUCATION

Boston University College of Engineering | Boston, MA Expected May 2023

B.S. in Biomedical Engineering, Minor in Innovation/Entrepreneurship

- Dean's List Fall 2019, Fall 2020, Spring 2021, Fall 2022
- GPA: 3.27

Relevant Coursework: MATLAB, Engineering Design, Circuits, Signals & Controls, BME Measures, Device Design

RELEVANT EXPERIENCE

Associate Clinical Specialist Intern | Chand Lab | Boston, MA November 2021 – Present

Working in MATLAB and Python, concerning data collected from the dorsal premotor cortex in monkeys which records neuronal activity based on decision making by these monkeys. Using Solid works, Simulink and other applications to create parts to set new tasks and collect data.

Co-Founder of Startup | Fighting Irish Coffee Shop October 2018– Present

Co-Founded a coffee shop that sells to students and teachers before school. The shop was created through an innovation pathway for high school students, and still runs today.

Advanced Sales Representative | Vector Marketing | San Francisco, CA May 2020 – September 2021

Worked in teams to complete projects for management. Sold products in-person as well as through zoom, while learning how to connect with customers and work through company issues.

Intern | Corona Net Project | Boston, MA May 2021 – Aug 2021

Worked in teams to complete projects and code for the project, specifically coding policies that were put in place by governments into a database. Also trained other interns and research assistants to ensure the fulfillment of the database for the United States.

SELECT PROJECTS

Understanding the Microcircuit in Monkey Primary Visual Cortex Aug 2022 – Present

Created a graphical user interface to manually curate waveforms from primate primary visual cortex for unsupervised Machine Learning. Co-Author on the paper, which is currently under review.

Primate Grasping Task Aug 2022 – Dec 2022

Created a system of programs through Simulink, MATLAB, and State flow. Modeled novel turntable with Solid works. Program is designed to take primate inputs to queue an experiment, all while collecting data from the subjects' brains with neuropixels to further understand neural dynamics.

Subacromial Spacer Jan 2021 – May 2021

Working to design, test and implement a device to restore the subacromial space for those with irreparable rotator cuff tears.

LEADERSHIP & COMMUNITY SERVICE

Boston University Children's Glaucoma Fundraiser| Boston, MA Aug 2019 – Present

Coordinated an event which raised over one hundred thousand dollars.

Sophomore Engineering Mentoring Program, Mentor | Boston, MA Aug 2021 – present

Mentor group of 25 sophomore Biomedical Engineering students.

SKILLS

SolidWorks, MATLAB, C, Arduino, Simulink, Java, Microsoft: Excel, PowerPoint, 3D printing.

Data Analysis with MATLAB

- Collaborated with team of three to scrub a large data set using MATLAB script.
- Identified relationship between counties and cancer death rates using Machine Learning.

Aug 2019 – present Aug 2021 – present

Felicia Pinto

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EDUCATION

Boston University College of Engineering Boston, MA
Bachelor of Science Biomedical Engineering *Minor: Materials Science* May 2023
Relevant Coursework: Programming, Engineering Design, Materials Science, Thermodynamics, Signals and Controls, Systems Physiology, Polymers, Fluid Mechanics, Biomaterials

SKILLS

Lab: Experimental planning, dissection, animal handling, cell culture, tissue culture, biochemical assays, radiolabeling, confocal microscopy, data analysis, cell therapies device handling
Computer: MATLAB, Arduino IDE, CAD, Microsoft Office, Chrome Suite
Languages: English (Native), French (Upper Intermediate)

WORK EXPERIENCE

Undergraduate Researcher, Connizzo Lab, Boston, MA June 2021 – Present

- Conducted more than seven independent studies to contribute to lab knowledge in tendon research with intent to publish

Takeda Cell Therapies Intern, Automation, Cambridge, MA May 2022 – Aug 2022

- Supported two projects driving further automation for Takeda's Cell Therapies processes and products
- Evaluated 3D suspension-based bioreactors for cell therapies products over eight experiments
- Developed and executed testing protocol on Water-Free Cryovial Thawing Platform Project

PROJECTS

BU Senior Design at Draper: Development of a Burst Pressure/Leak Testing System for Surgical Adhesives

- Iterated on existing system design with two prototypes to improve testing efficiency
- Conducted over twenty burst pressure trials and compared results to industry reported burst pressures to aid in development of a novel microstructured tissue adhesive and validate testing system

Takeda: Water-Free Cryovial Thawing Platform

- Designed and executed four *in vitro* experiments and engineering tests to evaluate effect of thawing platform on cell biology relative to a traditional water bath
- Interpreted experimental results and presented project progress to Cell Therapies leadership team and colleagues

BU UROP: The Role of Glutamine Supplementation in Protein Synthesis of Murine Tendon Explants

- Designed four experimental studies with guidance of faculty mentor
- Ran four biochemical assays on radiolabeled tendons after culture and performed statistical analysis on data
- Presented results at 2021 UROP poster symposium for BU faculty and students
- Presented poster at 2022 Biomedical Engineering Society (BMES) Annual Meeting

Truss Design Project

- Collaborated with a partner to model building process of a truss and wrote MATLAB code to assess designs
- Analyzed materials and prepared final design through physical testing correlating to code output

Arduino Pulse Oximeter

- Built Arduino circuit and wrote code for pulse oximeter sensor to display blood oxygen and heart rate on LCD
- Created 3D printed packaging with CAD for circuit and powered circuit with battery attached to switch
- Wrote engineering report for product and created product presentation video

LEADERSHIP & ACTIVITIES

Boston University Society of Women Engineers (SWE) – Executive Board, Networking Chair Sep 2019 – Present

- Communicate with industry representatives and other campus organizations to foster relationships and plan events to enrich experiences of women in engineering

Biomedical Engineering Society – Member Sep 2019 – Present
Boston University HUB Advisory Board – Member, College of Engineering Representative Sep 2020 – Sep 2022

Christo Alex Pulickal

914-704-7024 | cpulicka@bu.edu | linkedin.com/in/cpulickal

EDUCATION

Boston University | Boston, MA **Expected Jan. 2024**
B.S. in Biomedical Engineering **| GPA:** 3.69/4.00 **Engineering Dean's List:** Fall 2020 - Fall 2022

SKILLS

JIRA, JAMA, MATLAB, C, Arduino, Python, Google Suite, MS Word, MS Excel, CREO, Sketchup, Microscopy, Pipetting, Assay Preparation, Good Laboratory Practice, ELISA, Mentoring

EXPERIENCE

Albro Lab, Undergraduate Researcher | Boston University **Oct. 2022 – Present**

- Investigated TGF-β's transport-diffusion properties to treat osteoarthritis in the synovial joint
- Completed ELISA, GAG assays, DIC experiments, and mechanical testing to evaluate engineered musculoskeletal tissue development in order to optimize growth factor delivery strategies

NYS Emergency Medical Technician | Eastchester Volunteer Ambulance Corps **June 2020 – Present**

- Provided basic life support and emergency treatment for patients with traumatic or medical issues and completed patient care reports post-transfer of care
- Transported patients within EVAC's area of coverage to appropriate healthcare facilities

Technology Innovation Scholars Program Ambassador | Boston University **Sep. 2020 – Present**

- Led a team of college mentors during a weekly FIRST Lego League preparatory program for low-income 4th and 5th-grade students at Gardner Pilot Academy
- Guided a weekly program for 100+ Boston elementary students to teach mechanics using LEGOs

NYS Contact Tracer/Case Investigator | Public Consulting Group **Nov. 2020 – Jan. 2022**

- Contacted 300+ individuals exposed to COVID-19 cases in Dutchess, Orange, Putnam, Rockland, Suffolk, Ulster, and Westchester counties
- Trained new contact tracers with contact tracing workflow, guidelines, and databases utilized by NYS

Surgical Robotics R&D Validation Co-op | Medtronic **July 2021 – Dec. 2021**

- Evaluated the Hugo™ RAS System in 20+ preclinical procedures with KOLs and end users
- Functioned as a circulator nurse during surgical operations to ensure a sterile OR environment
- Designed an abdominal surgical trainer using CREO/Sketchup for usage in various surgical setups

PROJECTS

Project Javelin: Titania Nanorods **Oct. 2022 – Present**

- Led a senior design team to establish a hydrothermal approach for creating titania nanorods on a biologically inert metal substrate for use in orthopedic implants
- Coordinated with DePuy Synthes and Boston University contacts to order reagents, secure lab equipment, identify experimental issues, and review results

Arduino-Based Microfluidics Heater **Feb. 2022 – May 2022**

- Constructed a parallel resistor heater for the CIDAR Lab's various microfluidics projects
- Coded an Arduino program to control temperature output and notify users when at undesired levels

MATLAB Viral Pandemic Simulation **May 2020 – Dec. 2021**

- Employed game theory principles in MATLAB to simulate human interactions during a pandemic
- Determined a theoretical human strategy to minimize the viral spread through payoff matrices

CO-CURRICULARS

BU Rocket Propulsion Group (BURPG) | IREC ECE Telemetry Department **2020 – 2022**
BU Robotics and Ambient Intelligence Labs (RAILS) | Operations Supervisor **2020 – 2021**

Nicholas Rabines

nrabines@bu.edu • (617) 599-8628 • LinkedIn

EDUCATION:

Boston University, College of Engineering **Boston, MA**
B.S. in Biomedical Engineering Expected: May 2023
Concentration in Technology Innovation & Machine Learning
Relevant Coursework: GPA: 3.65/4.00

Biomedical Measurements I & II	*Device Diagnostics and Design*	*Engineering Design*
Biomedical Signals & Controls	*Probability, Statistics & Data Science*	*Deep Learning*
Programming for Engineers	*CAD and Machine Components*	*Computational Biology*

EXPERIENCE:

ARAMCO **Dhahran, Saudi Arabia**
Data Management Intern Jun 2022 - Aug 2022

- Enhanced data quality by correcting data discrepancies in corporate databases via Oracle SQL and PowerBI
- Aided in master data management (MDM) project to distribute golden record data into an MDM software, reducing time employers spend searching for data and allowing employers to devote more time on data analysis
- Documented PoC for EnergyIQ & IHS Markit MDM software, detailing software connectivity to corporate databases and functionality in streamlining data distribution and improved company analytical efficiency
- Presented PoC findings to management for potential contract between company and MDM software

BTEC (Bioengineering Technology & Entrepreneurship Center) Boston University **Boston, MA**
Engineering Laboratory Assistant Jan 2022 - Present

- Supervise operations and safety in laboratory, catalog and maintain lab equipment and supplies, assist students working on Capstone and/or individual engineering projects
- Prepare demos and presentations for professors and university visitors on numerous biomedical devices, including iBright Gel Imagers, Cell Imaging Systems, and 3D bioprinters
- Created demos include: gel electrophoresis for DNA gel image analysis, 3D-modeling sample ligament for bioprinting, and Celleste Imaging Software for image deconvolution on the EVOS M7000

TUMI Medical Mission **Iquitos, Peru**
Public Health Service Volunteer & Translator Jun 2018 - Aug 2019

- Volunteered in medical mission organized by MSU's College of Osteopathic Medicine as a translator, collaborating with doctors and medical students involved in clinical practice and supporting logistics of the clinic

PROJECTS:

Boston University, College of Engineering **Boston, MA**
Basement Monitor Project Oct 2021 - Dec 2021

- Designed prototype basement monitor which measured temperature and humidity, informing client once their desired threshold temperature and humidity values had been reached via email notification
- Programmed prototype with C++ language, utilized Arduino Uno and ESP32 microcontrollers to power circuit and send email notifications via Wi-Fi connectivity, modeled and 3D printed prototype cover with SolidWorks

Machine Learning Pet Classification Project Apr 2021 - May 2021

- Developed an image classifier to distinguish between cat and dog images from a large data set using machine learning algorithms and a binary classification function in MATLAB programming language

LEADERSHIP & ACTIVITIES:

Member of: LATAM BU, Society of Hispanic Professional Engineers, Biomedical Engineering Society, BU Soccer

- Organized events allowing Latin American and Hispanic students to integrate and adapt faster to the university's community while providing networking opportunities for academic and professional development

SKILLS

MATLAB • C • C++ • Python • SQL • PowerBI • CAD • 3D Printing • Data Analysis • Medical Devices • Problem Solving • Teamwork • Google Office Suite • Microsoft Office Suite • English • Spanish

HONORS & AWARDS:

- Dean's List Award: Spring 2020, Fall 2021, Spring 2021

SAIF ELDEEN RAGAB

sragab@bu.edu ● 857.971.0693 ● Boston, MA

Education

Boston University, College of Engineering Boston, MA
B.S. in Biomedical Engineering (GPA: 3.64/4.00) Expected May 2023

Research Experience

Undergraduate Research Assistant and Intern - **Roblyer Lab** Jun 2022 - Present
Project 1: **Dynamic Multilayered and Shortwave Infrared Optical Phantoms** Senior Design Class Project

- Outlined and engineered robust tissue-mimicking optical phantoms for imaging system calibration and testing
- Experimented different techniques to create multilayered silicone phantoms with changeable optical properties
- Administered the use of LCDs to dynamically change optical properties of phantoms to mimic living tissue
- Tested different dyes to develop phantoms with specified scattering and absorption coefficients in the SWIR wavelength region

Undergraduate Research and Teaching Assistant - **Vardar-Ulu Research Group** Jan 2021 - Present
Project 2: **Bringing Biochemistry Visualization Tools to Classrooms** Research in Chemistry Education

- Created augmented reality objects of chemical molecules by utilizing chemistry applications like Chemdraw and Mol* to assemble a library of 180+ molecules for 250+ students
- Collected and analyzed student usage data of this library to gain insight into chemical education research
- Mentored students in how to use molecular visualization to create professional figures, as a part of their study techniques in peer hours and information sessions

Skills

Laboratory: Dry Lab: SWIR spectroscopy, Laser tuning, Optical phantom synthesis, NMR, FTIR, Wet Lab: Dialysis, Thin layer chromatography, Ion-Exchange chromatography, Protein purification, Enzyme Kinetics
Computer: Languages: MATLAB, Software: Mol*, PyMOL, ChemDraw, Mestrenova, Microsoft Office Suite
Languages: Arabic – Native, English – Fluent

Conferences and Symposiums

S. Ragab, D. Suciu, D. Roblyer, *"Porcine Desiccation for Water-Content Analysis Experiment"*, KUH Summer Undergraduate Symposium, Webinar, August 2022, Oral Presentation.
S. Ragab, D. Vardar-Ulu, *"Bringing Biochemistry Visualization Tools to Classrooms"*, Undergraduate Chemistry Research Symposium, Boston, Massachusetts, Expected April 2023, Poster presentation.

Leadership

Peer Tutoring Boston University Education Resource Center
Tutor Oct 2020 - Jan 2022

- Held one-on-one tutoring sessions for Calculus and Organic Chemistry, completed 60+ sessions
- Collaborated with students in reviewing class material and created tailored study solutions
- Compiled student progress reports and reviewed with students to provide guidance and areas for improvement

Summer Organic Chemistry Prep Course (OrgoPrep) Boston University Chemistry Education
Cohort Leader Jun 2021 - Aug 2021

- Headed three distinct Cohorts of ~21 students each through discussion worksheets on a weekly basis
- Arranged three weekly office hours focused on deeper discussions about Organic Chemistry
- Formed study guides with students during Orgoprep discussion for later Organic Chemistry classes

Activities:

Boston University Arabs Club, Member Sep 2021 - Present
Boston University Gaming Club, Member Sep 2019 - Present
Biomedical Engineering Society, Member Sep 2019 - Present

Alisha Katherine Ragatz

aragatz@bu.edu | 203-470-8190 | www.linkedin.com/in/alisha-ragatz

Education

Boston University College of Engineering Boston, MA
Bachelor of Science in Biomedical Engineering, GPA: 3.85/4.00 (Dean's List). Expected May 2023

Relevant Coursework

Solid Biomechanics | Biomaterials & Tissue Engineering | Biophysics | Programming | Systems Physiology | Design

Skills

Computer: MATLAB, Python, C, Arduino; Schrödinger Software Package (Maestro, Glide), FTMap; Image filtering, cross correlation for image registration and movie manipulation.
Laboratory: Miniprep, gel electrophoresis, qPCR, and chromatography; Compound microscopes, micro-pipettes, and spectrometers; Soldering, constructing filters, circuit design and analysis.

Professional Experience

ENG BE 428 Teaching Assistant Jan 2023 - Present
Boston University College of Engineering Boston, MA

- Assisted lecture delivery and course organization in the Device Diagnostics and Design course for 40 students.

ENG BE 403 Grader Sep - Dec 2022
Boston University College of Engineering Boston, MA

- Graded weekly homework assignments for 100+ students taking the Biomedical Signals and Controls course.

Research Intern Summer 2021, 2022
Oden Institute for Computational Engineering and Sciences**,** University of Texas at Austin Austin, TX

- Researched metrics of limb-core dynamics during weight transfer activities using a portable, inexpensive motion capture system to better understand human balance.
- Wrote IRB proposal, solicited feedback from principal investigators, and got approval with minor changes.
- Developed motion capture setup using multiple temporally synchronized Azure Kinect cameras to allow for complete and accurate data collection.
- Standardized data collection process in Python and implemented data stitching and filtering to simplify data acquisition, increase speed, and minimize data transfer errors.
- Coded MATLAB program to verify motion capture accuracy and refined camera setup to improve data collection and extraction based on analysis of trial data.
- Collaborated with first-year intern to research specific factors to investigate during analysis of weight transfer data. Determined correlated variables and coded MATLAB programs in preparation for data collection.

Select Projects

Computational Investigation of Peptide docking to Fibrin, Senior Design Project Sep 2022 - Present

- Defined specific aims, research strategy, expected outcomes, and timeline for project.
- Conducted search of literature and the RCSB PDB to identify peptides that are known to bind fibrin.
- Integrated existing data to find binding sites on fibrin using Schrödinger's Maestro software and FTMap.
- Performed *in silico* protein-protein docking using Schrödinger's Glide docking software.
- Designed optimized peptides that bind to fibrin for tissue targeting and molecular imaging of early post-surgical abdominal adhesions.

Pulse Oximeter Design Project Mar - Apr 2021

- Designed low-cost, battery powered pulse oximeter intended for at home use using materials from the Arduino Starter Kit and 3D printer.
- Developed Arduino program and devised circuitry in collaboration with group of four.
- Created final prototype that quickly and accurately displays SpO2 values and heart rate.

Activities

BU Dance Theater Group, member Sep 2020 - Present
Bucknell Dance Company, member Aug 2019 - May 2020

Laura Raiff

lauraraiff14@gmail.com • (412) 553-9050 • www.linkedin.com/in/laura-raiff • Boston, MA

EDUCATION

Boston University, **College of Engineering** — Boston, MA
Bachelor of Science in Biomedical Engineering — Expected May 2023
Minor in Computer Engineering
GPA: 3.7/4.0, Dean's List for 3 semesters

RESEARCH EXPERIENCE

Han Lab, Boston, MA — Jan 2022 - Present
Research Assistant

- Performed *in vivo* voltage and calcium imaging on mice to investigate biological mechanisms of ultrasound neuromodulation
- Modeled mouse treadmill in CAD, built machined parts, and created circuitry with Teensy Arduino
- Investigated spatial correlation in modulated neuronal data, contributing figure and analysis to upcoming manuscript
- Wrote grant proposals to BU Undergraduate Research Opportunities Program to fund independent research

Stepp Lab for Sensorimotor Rehabilitation Engineering, Boston, MA — Sep 2020 - Aug 2021
Research Assistant

- Analyzed speech data for effects of cognitive load and communication modalities on diagnostic acoustic metrics
- Performed statistical tests, data pre-processing, and visualization in MATLAB, Excel, Pratt, and CorelDRAW
- Presented poster at 2021 BU Undergraduate Research Opportunities Program Symposium to peers and researchers

WORK EXPERIENCE

Boston University College of Engineering, Boston, MA — Sep 2021 - Present
Probability, Statistics, and Data Science Teaching Fellow

- Taught concepts of machine learning, probability, and statistics to 20 – 40 students in weekly office hours

Delsys, Inc., Natick, MA — May 2022 - Aug 2022
Research and Development Intern

- Led algorithm development for automated speech signal compliancy analysis using Python and Tensorflow
- Co-authored publication about an EMG-based silence speech interface

PROJECTS

Encrypted Genetic Signature Website

- Created software to encrypt personal information and translate into unique genetic sequence leading a team of 4
- Developed with PHP, Python, HTML, CSS, JavaScript to make a user-friendly and functional website

Custom Emacs IDE

- Transformed Emacs into a streamlined IDE: featuring customizable themes, multiple language support, simplified default key bindings with team of 5

Pulse Oximeter

- Developed Arduino software to calculate heart rate and oxygen saturation from a finger's absorption of light
- Designed Arduino circuitry to collect data with a photodiode, timed red and IR LEDs, and an LCD display
- Presented to class of 15 and 2 professors final design and performance analysis of prototype

Truss Design

- Prototyped a truss out of acrylic capable of holding 2 lbs in collaboration of 3 engineers
- Designed simulation of stress tests in MATLAB to validate design
- Reported results and final design in a technical engineering report

SKILLS

Programming Languages: Python, MATLAB, C++, C, HTML, CSS, Java, JavaScript
Laboratory Skills: Handling lab animals, Microscopes, Pipetting, Soldering, Gel Electrophoresis, PCR
Computer Skills: Adobe Illustrator, Microsoft Excel, CORELDraw, Arduino

LEADERSHIP & ACTIVITIES

Member, Society of Women Engineers at Boston University — Jan 2020 - Present
Member, Environmental Student Organization at Boston University — Jan 2020 - Present
Engineering Student Advisor at Boston University — Aug 2021 - Dec 2021

ANUSHKA RATHI

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EDUCATION

Boston University (BU) College of Engineering — Boston, MA
Bachelor of Science in Biomedical Engineering — Expected May 2023

RESEARCH EXPERIENCE

Research Assistant — September 2022 - Present
Movement and Applied Imaging at BU (PI Dr. Deepak Kumar) — Boston, MA
- Testing novel music-based device for gait rehabilitation in patients with knee OA

Research Assistant — May 2021 - December 2022
Morphable Biorobotics Lab (MBL) at BU (PI Dr. Tommaso Ranzani) — Boston, MA
- Developed novel designs in wearable and surgical devices using soft materials

Research Assistant — May - August 2022
ESTAR at the University of Michigan Ann Arbor (PI Dr. Alex Shorter) — Ann Arbor, MI
- Evaluated effects of context on heart rate while walking in different settings

TEACHING EXPERIENCE

Learning Assistant — January 2022 - Present
Boston University College of Engineering — Boston, MA
- Advised during lectures and lead discussion sections for the ENG Static Mechanics course

Undergraduate Engineering Tutor — September 2020 - December 2021
Boston University College of Engineering — Boston, MA
- Tutored peers in prerequisite and high-level engineering courses

General Physics Learning Assistant — January - August 2021
Boston University College of Arts and Sciences — Boston, MA
- Led discussion sections of calculus-based physics and assisted during lectures

PROJECTS

Multi-Layer Additive Manufacturing Project (PI Dr. William Boley) — October 2021 - January 2022
- Engaged in educational research through an NSF-funded project regarding 3D printing

SKILLS

Programming: MATLAB, Arduino, C, C++
Software: AutoCAD, OnShape, SolidWorks, Adobe Illustrator, OceanView, LabView

HONORS & AWARDS

Dean's List — December 2019 - Present
Distinguished Scholars Research Fellowship — May - August 2021

LEADERSHIP

Ambassador, Technology Innovation Scholars Program, Boston University — September 2020 - Present
- Mentor for Boston Public Schools in teaching STEM to underrepresented groups

Sophomore Advising Coordinator, EK200, Boston University — February - December 2022
- Lead advising program for undergraduate sophomores at BU

Judicial Board, Theta Tau Psi Delta, Boston University — May 2020 - September 2022
- Member of a professional fraternity dedicated to service, profession, and brotherhood

Ann C. Rizos

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EDUCATION

Boston University — Expected Graduation May 2023

Bachelor of Science in Biomedical Engineering

Minor: Innovation and Entrepreneurship

Relevant Coursework: Web Programming, Computer Science (Java), Statistics and Machine Learning, Engineering Design, Biomedical Measurements, Device Diagnostics Design, Solid Biomechanics, Thermodynamics and Statistical Mechanics, The Business of Technology Innovation

PUBLICATIONS

"Qualifying a human Liver-Chip for predictive toxicology: Performance assessment and economic implications", Communications Medicine, December 2022, contributor Ann Rizos

EXPERIENCE

Emulate Inc. — ***Boston, MA***

BioProducts Intern — June 2021-August 2021

- Organized, carried out, and analyzed data for a large-scale experiment to validate organ-on-a-chip technology as predictive toxicology with a team
- Optimized workflow of a 4-cycle long experiment in which 780 liver chips were used to test the toxicity of a selection of 27 drugs at varying concentrations in order to evaluate the chip's effectiveness for use as predictive toxicology
- Created dosing concentrations for chips with drug compounds based on each compound's apeutic human C_{max} to accurately model the doses of these drugs in the human body when they reach the liver
- Contributed to seeding organ-chips with human hepatocytes utilizing sterile technique
- Performed biomedical assays for albumin and ALT of the chips' top channel outlet effluents utilizing the Hamilton Vantage liquid handling platform to manage dilutions
- Acquired fluorescent confocal images of both fixed and live stained chips using the Opera Phenix Plus
- Coordinated with Charles River Laboratories to outsource LC/MS data for analysis

PROJECTS

Titania Nanorod Manufacturing — September 2022-Present

- Works with a team of 4 to develop a method for producing a nanoscale coating on titanium substrates
- Uses SEM imaging to collect data and evaluate topology and morphology of nanostructures
- Iterates on methods by manipulating variables to achieve desired specifications
- Presents progress and results to manager and peers periodically and makes adjustments based on feedback

Blood pH Monitor and Calculation Software Prototype — March 2022-May 2022

- Designed and developed a working device prototype to be incorporated into a hemodialysis machine that measures the pH of a patient's blood and calculates [HCO_3^-] and [pCO_2] to determine and alert physicians of potential complications with a team of seven
- Reached out to stakeholders, including patients and medical professionals, to identify current issues and pains with at-home hemodialysis and created a needs statement based on findings
- Constructed an elevator pitch to articulate concept and value of device
- Determined value proposition to describe what gains the product will produce and made a performance specification sheet that defined device requirements
- Identified and carried out possible killer experiments to validate further development of prototype
- Received positive feedback from peers and industry professionals following device pitch

LEADERSHIP AND VOLUNTEERING

Biomedical Engineering Society — January 2021-Present

- Work with peers to develop and use engineering technology to advance human well-being

Society of Women Engineers — January 2021-Present

- Collaborate with women engineers to serve and empower women in STEM by promoting diversity in engineering

Captain, Cross-Country/Track & Field — September 2018-May 2019

SKILLS

JavaScript, HTML, CSS, MATLAB, Python, Autodesk Fusion 360, SolidWorks, Microsoft Excel, Microsoft Outlook, Microsoft SharePoint, Adobe, Miniprep, PCR, sterile technique, spectrometry, iBright 1500 gel imager

Justin Sadler

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(832)-257-3402
www.linkedin.com/in/justin-allen-sadler
Boston, MA, 02215

EDUCATION
Boston University — B.S. in Computer Engineering Magna Cum Laude(In Progress)
August 2019 - May 2023
Honors: Dean's List at the College of Engineering
Current GPA: 3.82 / 4.00

SKILLS
Programming Languages: C/C++, Java, Python, MATLAB, Javascript, Go
Software: Tensorflow, Git, MS Office, Arduino IDE, ESP32, Node.js, Object-Oriented Programming, Full-Stack Development, LINUX, IoT applications, machine learning
Other: Interpersonal skills, project management, AGILE software development, communication, data structures, and algorithms

EXPERIENCE
Cognitivo Consulting: Sydney, Australia — Intern
February 2022 - June 2022

Conducted in-depth research on Optical Character Recognition (OCR) software techniques. Experimented with Google's OCR library, Tesseract, to build an image recognition model for Australian Medicare cards.

Performance Energy Aware Computing Lab, — Student Researcher
June 2021 - August 2021
Assisted research for project Pythia: an automated instrumentation framework for diagnosing performance problems in distributed applications with machine learning.

PROJECTS
Autonomous Driving Buggy:
Collaborated with two other students to program an autonomous buggy with PID control. Connected several sensors to an ESP32 microcontroller to ensure precise control.

Backend Software Development for Android App:
Collaborated with 3 other students to program an android application. I was responsible for the software architecture and programming of the Android phone's sensors to detect the tilt of the phone in the user's hand.

Kyra Scott

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EDUCATION

Boston University College of Engineering | Boston, MA — Expected May 2023
Bachelor of Science in Electrical Engineering and Biomedical Engineering, GPA: 3.94/4.0 (Dean's List)

Relevant Course Work

Device & Diagnostic Design	Intro to Electronics	Systems Physiology
Signals & Controls Systems	Fundamentals of Biomaterials	Thermodynamics & Statistical Mechanic

SKILLS

Laboratory: Mini-Prep, qPCR, Gel Electrophoresis, Pipetting, Microscopes, BSL-II & Class 4 Laser Trained, Tissue Care and Disposal, Cell Media Changes, Imaging Techniques, Soldering
Computer: Python, MATLAB, C, C++, Swift, SwiftUI, Arduino, CAD, Microsoft Office

RELEVANT EXPERIENCE

Oliveira Lab | Boston, MA — September 2022 – December 2022
Undergraduate Research Assistant

- Implemented the automation of a machine learning algorithm to track cell segmentation of 100+ cells in 10 different regions of a microfluidic chip.
- Improved and increased training data & masks resulting in an increase in accuracy and speed.
- Streamlined image analysis by merging multiple experiments with 50-250 images captured over 3-7 days.

Precision Engineering Research Laboratory | Boston, MA — August 2021 – August 2022
Undergraduate Research Assistant

- Imaged 20+ synthetic cardiac tissues weekly to see their ability to pace with laser light pulses.
- Wrote and edited MATLAB code by changing various parameters (e.g., frequency or pulse width) to increase the likelihood of the tissues ability to pace.
- Examined birefringence of cardiac tissue by detecting the directionality of emitted light.

Pulse Oximetry Instrumentation – Engineering Design Project — September – December 2020

- Designed and prototyped a pulse oximeter to read a person's pulse, heart rate, and blood oxygen levels.
- Built a circuit to detect differences in O_2 absorption in blood and coded an Arduino to process results.
- Created multiple design options and pick the best design given time, budget, and material constraints.

ADDITIONAL EXPERIENCE

Boston University College of Engineering | Boston, MA — January 2021 – Present
Head Undergraduate Teaching Fellow – Probability, Statistics, and Data Science for Engineers

- Guided 20-30 students' understanding and assisted on homework at weekly office hours.
- Graded 200 students' homework assignments and assessed and debugged MATLAB coding projects.
- Coordinated with 10 other UTFs by creating schedules and ensuring grading is done properly.

Gekkoto Inc. | Cupertino, CA — May – September 2020, June – August 2021
Intern

- Implemented new features for an iOS application to allow users to create Widgets on their home screens.
- Localized the mobile app for international markets by refining the UI to work for multiple languages.

LEADERSHIP

Boston University's Edge Dance Company, President — August 2019 – May 2023

- Managed a team of 15-20 dancers and coordinated with other colleges to perform at 4-7 shows annually.

Riya Sen

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EDUCATION

Boston University September 2019 – May 2023
Bachelor of Science in Biomedical Engineering | GPA: 3.74 / 4.00
Honors and Awards: Cum Laude, Dean's List, Lutchen Distinguished Summer Research Fellow, Boston University UROP Recipient, National Merit Scholar, FM Global Scholar

RESEARCH PROJECTS

Senior Design Project | Glia Engineering Lab | Boston University September 2022 - Present
Undergraduate Researcher

- Designing manufacturing processes for coating neural devices with cellulose-based polymer coating for improved device implantation and integration into host tissue
- Chemically characterizing and valuating coating quality and efficacy in biological applications via *in vitro* studies and cytotoxicity assays

Glia Engineering Lab | Boston University May 2021 - Present
Undergraduate Researcher

- Synthesizing trehalose-based coacervates of A_2 + B_3 branched polymers complexed with enzymes for stable, long term, local delivery of debriding enzymes to lesion environment of spinal cord injury
- Optimizing coacervate formation for *in vivo* studies in mouse models and *in vitro* cytotoxicity studies with neural progenitor cells via protein release assays

Redox Systems Biology Lab | Georgia Institute of Technology & Emory University May 2022 - August 2022
NSF Cell Manufacturing Technologies REU Trainee

- Computationally optimized system-wide metabolic activity to improve iPSC- cardiomyocyte differentiation using Flux Balance Analysis
- Developed preliminary cell culture protocols and imaging experiments to validate computational results using BioSpa Plate Reader and Mito Tracker Red fluorescent dye

WORK/VOLUNTEERING EXPERIENCE

Teaching Assistant and Grader | Boston University September 2020 - Present

- Managed and graded EK307 Electric Circuits labs
- Collaborated with professors to create course content and academic support resources

Peer Tutor | Boston University Educational Resource Center January 2020 - Present

- Tutored 3-4 students weekly for MA124 Calculus II and CH101 General Chemistry
- Created personalized study plans for students

EK100 Engineering Freshman Seminar Student Advisor | Boston University September 2021 - Present

- Facilitated discussions about course planning, engineering ethics, and diversity and inclusion
- Connected students with on campus resources and supervisors

SKILLS

Laboratory Techniques: NMR, FTIR, DLS, GPC, Flash Column Chromatography, TLC, Contact Angle, TGA/DSC, Rheology, Raman Spectroscopy, Rotary Evaporation, iPSC Cell Culture, iPSC-Derived Cardiomyocyte Differentiation, Immunohistochemistry, Mouse Dissection, Experimental Design
Programming Languages/Software: MATLAB, C, JavaScript, Arduino, ChemDraw Professional, MestReNova, Escher, SolidWorks, Prism GraphPad, SnapGene, Adobe Illustrator, Adobe Photoshop
Other Techniques: Flux Balance Analysis, Electronics (Breadboarding, Circuit Design, Soldering)

LEADERSHIP & ACTIVITIES

Boston University Jalwa | Captain, Manager, Secretary/Treasurer, E-board Member 2019-2022

- Choreograph, manage team finances and scheduling, organize travel, communicate with BU and national dance competition boards, perform at cultural events and national competitions

Boston University India Club | Outreach Chair, E-board Member 2019-2022

- Organize and host events to share South Asian culture to BU and Boston community

Yousuf Shehadi

yshehadi@bu.edu • 508-542-2677 • https://www.linkedin.com/in/yshehadi Boston, MA

EDUCATION

Boston University – Boston — Expected Jan 2024

Biomedical Engineering BS (A.B.E.T. accredited program)

EXPERIENCE

Research Assistant – Galagan Lab, Boston University — Dec 2022 – Present

- Conduct maintenance, autoclaving, and sterilization of equipment
- Run cloning, 96-well plate, and spectrophotometry experiments on different strains of E. Coli bacterium
- Performed data analysis on growth experiments, i.e., plotting and analyzing growth curves on MATLAB and Excel

Research Assistant – Hao Lab, Boston University — Dec 2022 – Present

- Responsible for inventory of lab equipment in a new CRISPR and AAV lab at BU
- Streamlined bookkeeping and ordering processes at Hao lab

Intern – Garuda Therapeutics — Sep 2022 – Nov 2022

- Identified genes causing disease and utilized the UCSD database to visualize human KLF4 gene
- Utilized software to design CRISPR-Cas9 gene knockout experiments and genotyping strategies to develop cells for regenerative medicine
- Demonstrated deliverables to project leader of designed gene knockout experiment

Intern – Dyno Therapeutics — Jun 2022 – Aug 2022

- Performed capsid genome mapping on Benchling of an AAV and strategized, in silico, the insertion of an oligonucleotide with methods such PCR and Golden Gate cloning into an AAV2 capsid
- Adapted, on a team of 2, a detailed methodology to identify highly differentiated insert sequences via barcoding for high-throughput techniques
- Presented, in detail, all necessary components for a comprehensive experiment such as primers, inserts, restriction enzymes, barcodes, and all intermediate products

PROJECTS

Project Manager - SyncoStrap, Device & Diagnostics Design, Boston University — Dec 2022

- Designed, built, and presented a functioning chest strap to monitor fainting precursor symptoms in POTS patients
- Conceptualized device monitor capabilities include: an accelerometer for seating position, heart rate with an ECG, and temperature and humidity using a DHT22 sensor
- Oversaw project management for a team of 5 and performed a cost analysis and conducted a pitch campaign

LEADERSHIP & AWARDS

Fundraising Chair, BU Arabs, Boston University — Jan 2022 – Present

- Fundraise and coordinate funds for events, philanthropic projects, scholarships

Chancellor's Scholarship (4 semesters) — Sep 2019 – May 2021

- Awarded to students maintaining a GPA of 3.8

Massachusetts High Demand Scholarship (4 semesters) — Sep 2019 - May 2021

- Awarded to students in a high-need field maintaining a GPA of 3.0

SKILLS

Lab techniques: Gel-electrophoresis, Mass-spectrometry, [Reverse transcription] Polymerase Chain Reaction (PCR, RT-PCR), SDS-Page, Cloning, Microplate Reading

Software skills: Java, MATLAB, SolidWorks, Arduino, LabScribe, Benchling

Medha Shekhar

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EDUCATION

Boston University, Boston MA **Expected May 2023**
B.S. in Biomedical Engineering
GPA: 3.63 on 4.0 scale; Dean's List: Fall 2020, Spring 2021, Fall 2022

University of Sydney, Sydney Australia
Study Abroad: Biomedical Engineering
Relevant coursework: The Business of Technology Innovation, Humanitarian Engineering, Probability Statistics and Data Science for Engineers, Clinical Applications of Biomedical Design, Foundations of Pharmacology

WORK EXPERIENCE

***In Vitro* Pharmacologist Intern, Internal Medicine Research, Pfizer, Cambridge MA** **Jun 2022 – Present**
- Performed literature searches to find potential targets of lipolysis to lower risk of developing type 2 diabetes
- Executed qPCR, lipolysis assays, and western blots to study gene expression and protein abundance
- Orchestrated experiments to explore different pathways of lipolysis
- Presented recommendations to lipolysis team based on results of experiment and data analysis

Consulting Intern, Me and My Wellness, Sydney AU **Mar 2022 – May 2022**
- Conducted research on relevant public health topics to create articles and podcasts for company website
- Aided with data analysis of clients' food diets
- Promoted company services to potential clients at networking meetings

Undergraduate Research Associate, Boston University Chen Tissue Microfabrication Lab **Feb 2021 – Dec 2021**
- Engineered an *in vitro* 2D co-culture of cardiomyocytes and cardiac fibroblasts to characterize fibrotic remodeling
- Collaborated on two PhD projects studying cardiac fibrosis via human 3D *in vitro* models of the heart
- Conducted literature reviews, quantified tissue forces on MATLAB and ImageJ, seeded tissues, performed proliferation assays, determined level of fibrotic gene expression through qPCR
- Trained incoming graduate student on in lab techniques
- Presented results to graduate and undergraduate members of lab

ACADEMIC PROJECTS

- Senior design project in Chen Tissue Microfabrication Lab aimed at completing a high throughput assessment of paracrine factors on fibrotic remodeling
- Devised the health sector of a refugee camp following guidelines from the SPHERE handbook and SDGs
- Designed and prototyped a commercial Pulse Oximeter using an Arduino Uno

CO-CURRICULARS/OTHER

Partnership for Quality Medical Donations Member (PQMD) **Aug 2022 – Present**
- Enhanced knowledge on public health by attending conferences related to global health polices, humanitarian assistance, and health system strengthening

Blood Drive Coordinator of Boston University Red Cross Club **Jun 2021 – Present**
- Partnered with American Red Cross to organize and conduct blood drives at Boston University

Boston University Undergraduate Research Opportunities Program **Jun 2021 – Aug 2021, Sep 2021 – Dec 2021**
- Received funding for independent 2D *in vitro* cardiac model research project, presented at school wide UROP symposium

Boston University Club Tennis Team **Aug 2019 – Aug 2021**

SKILLS

Laboratory: Pipetting, microscopic imaging, RNA extraction, making cDNA, qPCR, PCR primer design, iPSC and *in vitro* cell culture, cell proliferation and apoptosis assays, immunohistochemical staining, lipolysis assays, western blots
Computing: Intermediate MATLAB programming, Excel, ImageJ/FIJI, Statistical Analysis, Arduino, GraphPad Prism

Sarah Sheng

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EDUCATION

B.S. Biomedical Engineering, Boston University — Expected May 2023
GPA: 3.66; GPA in Biomedical Engineering: 3.73
Recipient of the Distinguished Summer Research Fellowship (DSRF) — 2022

SKILLS

Computer: MATLAB, C, Python, Raspberry Pi, Arduino, CAD Solidworks, OnShape, Microsoft Office, MacOS
Engineering: Oscilloscopes, Optical Spectrometer, Arduino Circuits, ELISA, Liquid/Gel Phantoms

PROJECTS

Panoramic Camera Design for the Detection of Colorectal Cancer (Bigio Lab), Boston Univ. Sep 2022 - Present
- Design a multispectral illumination and imaging device for identifying and diagnosing rectal cancer
- Stitch multi-wavelength images together to develop a panoramic image of rectal canal through Python
- Validate device on silicone phantoms mimicking healthy and abnormal tissues in rectal canal

Oxygen Saturation Mapping 2D Imaging Device (Bigio Lab), Boston Univ. 2022
- Construct a 2D imaging device for tumor detection via oxygen saturation via Python & Matlab
- Compute the SO2 based on absorption and scattering of wavelengths of light on biological tissue
- Present research to Boston University's Dean of the College of Engineering, Kenneth R. Lutchen

Novel Evaluative Probe for Real-Time Hydration Observation (NEPHRO) (Roblyer Lab), Boston Univ. 2022
- Cooperate with 3 engineers to develop a SWIR probe for hydration level monitoring during hemodialysis
- Develop gel phantoms modeling different lipid concentrations with varying amounts of heavy cream
- Measure scattering of light collected from probe & analyze electrical signal

Pulse Oximeter Design Project (EK 210 - Design Class), Boston Univ. 2021
- Collaborate with 3 engineers to create a pulse oximeter for COVID diagnostic testing
- Model structure of a pulse oximeter utilizing CAD Solidworks and a 3D printer
- Compute spO2 with different wavelengths (NIR and red light) operating an Arduino Uno

Infant Anti-Rolling Medical Design Device Project (BE 428 - Design Class), Boston Univ. 2021
- Partner with 3 engineers to develop an anti-rolling device to reduce Sudden Infant Death Syndrome
- Test torque infants at different age groups can produce in a Solidworks simulation
- Model structure of device utilizing CAD Solidworks, 1-D hinges, and wires

Artificial Heart Valve Poster Project (BME 101), Univ. of Rochester 2019
- Model effectiveness of mitral valve replacements in patients with stenosis in excel
- Modeled a bi-cupid mechanical heart valve using OnShape and built a 3D-printed prototype

SELECT EXPERIENCE

Emergency Medical Technician — Jan 2017 - Oct 2021
Basking Ridge Fire Company - (Liberty Corner, NJ)
- Respond to emergency calls provide immediate care to patients and transport to medical facilities
- Maintain ambulances and medical devices (EKG, defibrillators, pulse oximeters, etc…)

OTHER EXPERIENCE

Biology Financial Assistant — Sep 2021 - Present
Biology Office - (Boston, MA)
- Enter financial data into management system & organize and file work-study employment forms
- Transfer financial tracking system from The Grant Management System (GMS) to Excel

Member Services Associate — May 2021 - Aug 2021
Lifetime Fitness Athletic Center - (Berkeley Heights, NJ)
- Direct members checking in, answer phone, change membership accounts, enter sales transactions

Front Desk Office Assistant — Sep 2020 - Oct 2021
Instructional Biology Office - (Boston, MA)
- Administer biology makeup exams & distribute biology lab kits, lab room keys, graduation materials

LEADERSHIP

Treasurer of BU Knitting Club, Gold Award Recipient and Ambassador of Girl Scouts of Northern New Jersey, Alpha Sigma Kappa - Women in Technical Studies, Society of Women Engineers (SWE), Volunteer and Student Manager at Memorial Sloan Kettering Cancer Center

Maria Shevchuk

maria410@bu.edu • (857) 972-0811 • https://www.linkedin.com/in/maria-shevchuk • Boston, MA

EDUCATION

Boston University, Boston, MA May 2023
Dual Degree: *Bachelor of Science in Biomedical Engineering | Bachelor of Arts in Computer Science*
Activities: Girls Who Code (Secretary), ProductVision, Women's Water Polo, Hack4Impact, Third Culture Club
Awards: Dean's List, 1st place Device Design competition

WORK EXPERIENCE

Red Hat, Boston, MA

Data Scientist*, BU Collaboratory* September 2022 – Present

- Developing a model to quantitatively describe open-source project health for Project Aspen.
- Conducting experiments and analyzing repository data from 500,000+ open-source projects to optimize feature selection and improve model accuracy.
- Participating in weekly team meetings, presenting findings, and providing feedback.

Software Engineer*, Internship* May 2022 – August 2022

- Worked with product managers to define and start an open-source project, compiled easy-to-follow documentation to enable contribution.
- Developed a demo application using Python, Streamlit, and Nvidia's Project MONAI with goal of promoting Red Hat OpenShift Data Science services.
- Volunteered at DevConf.US 2022 and created documentation for demo workshops.

Machine Learning Researcher*, BU Collaboratory* September 2021 – May 2022

- Developed Machine Learning algorithms using frameworks such as TensorFlow and PyTorch, investigated ways to improve model performance and accuracy.
- Published a series of articles and contributed to open-source research via platforms such as GitHub.
- Delivered weekly 20-minute lectures on newly learned material to keep team updated and document on-boarding process for future members.

Boston University, Boston, MA

Teaching Assistant*, College of Engineering* August 2021 – January 2022

- Coordinated lab and discussion sections for 40+ students, lectured on important concepts and tools in MATLAB and C programming languages.
- Provided in-class feedback and answered questions to help strengthen students' programming technique and efficiency.
- Facilitated 2-hour weekly office hours to provide students with guidance on homework and lab assignments.

Data Annotator, *AI Research Initiative* February 2021 − September 2021

- Collaborated with a team of engineers to design a recycling robot with goal of creating a more efficient, profitable recycling system.
- Applied knowledge of CVAT (Computer Vision Annotation Tool) to annotate 200+ data frames weekly.
- Delivered weekly progress reports to ensure organizational success and keep team members updated.

Program Manager*, Dean of Students Office* March 2020 – August 2021

- Assisted, triaged, and found solutions to a variety of university-related concerns from students, parents, and faculty.
- Facilitated implementation of COVID compliance procedures for operation processes on campus.
- Managed a team of 8 student employees to collect and distribute weekly content on behalf of the University.

SKILLS

Languages: English (fluent), Russian (native/fluent), Spanish (conversational)
Technical skills: Python, NumPy, Pytorch, Sci-kit learn, Go, SQL, C/C++, Java, MATLAB, Agile, Spark
Interests: Water Polo, Weightlifting, Crochet, Road trips, Pets, Boardgames, Card games

Samuel A. Smith Malizia

Smalizia@bu.edu • (954) 330-1115 • linkedin.com/in/samuel-smith-malizia • Boston, MA.

Education

BOSTON UNIVERSITY Boston, MA
Bachelor of Science in Biomedical Engineering. May 2023

Experience

BOSTON CHILDREN'S HOSPITAL Boston, MA
Research Intern – Internship. October 2021 - Present

- Led assembly of an Ophthalmic Photosensitive Analyzer (OPA) at the Brain and Eye Pain Imaging (BEPI) Lab, after receiving 8-hour on-site training at Bascom Palmer Eye Institute at the University of Miami.
- Recorded data from 60 participants to Excel worksheets with extreme detail attention.
- Analyzed Magnetic Resonance Imaging (MRI) raw data, after obtaining training of Functional Magnetic Resonance Imaging of the Brain (FMRIB) Software Library (FSL).
- Presented monthly medical journals with an estimated length of 20 to 30 minutes to all members of BEPI.

BOSTON UNIVERSITY Boston, MA
IT Support Specialist/ Desktop Support Assistance. May 2022 - Present

- Identified, diagnosed, and addressed 500+ customer technical issues concerning computer hardware and software, achieving a satisfaction rating of 95%.
- Experienced in deploying over 100 laptops, desktop computers and Apple devices after imaging or re-imaging for faculty, staff, and members of Boston University.
- Delivered customer service in person and over phone related to any IT related issue.
- Maintained 1000+ technical documents for the IT support team through ServiceNow incident creation method.

Learning Assistant. January 2022 - May 2022

- Provided help to professor in teaching SolidWorks software to a group of 50 students in the Spring semester.
- Provided guidance and support to students while projects were developed, achieving a 90% satisfaction rate.
- Gave extra help to students over weekly office hours or inquiries via email.

Projects

Lung Acoustics Potential Diagnostic Biomarker, Senior Design Capstone – Nia Laboratory

- Designed and prototyped a negative pressure chamber to inflate and deflate a pig lung looking for its resonance.
- Collaborated with four engineers on a multidisciplinary project, combining hardware, software, and data analysis.
- Created a standardized method of detecting pulmonary diseases using acoustics.
- Conducted a literature review and synthesized results into a technical report.

At Home Method to Test for Cavities, Engineering Design class.

- Constructed a prototype to identify cavities from home to promote oral health.
- Employed a blue laser with a camera to a 3-D printed case with a Raspberry Pi to monitor fluorescence of demineralized teeth versus healthy ones.
- Coordinated with a team of three peers to collaborate on project and lead design process.
- Managed a $100 budget and resources to model a prototype within a 3-month timeline.

Pulse Oximeter, Engineering Design class.

- Devised and built a Pulse Oximeter utilizing Arduino, 3D printing, and machining to measure oxygenation levels and heart rate.
- Analyzed and synthesized data of 10 participants to establish solutions to engineering-related problems.
- Programmed an Arduino microcontroller to accurately display the results of the data analysis on an LCD display, such as oxygen saturation.

Skills

Technical: Data Analysis, Wet Lab, Dry Lab, Microscopes, Microsoft Office, FSL, COMSOL, SolidWorks, 3D Printing, OceanView and MATLAB.
Organizational: Time Management, Workflow Development, Project Planning and Implementation, and Teamwork.
Languages: Spanish (native speaker), English (fluent), and Italian (working proficiency).

Leadership & Activities

Member, National Society of Leadership and Success October 2019 - Present
Member, Biomedical Engineering Society February 2021 - Present
Member, Medical Ethics Society February 2021 - Present

Caroline Leilani Manuatu Stevenson

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EDUCATION

Boston University, Boston, MA — Expected May 2023

B.S. in Electrical Engineering

- *Activities:* Society of Women Engineers (SWE), IEEE student chapter.

Interdisciplinary Design Project: Boston University BME

- Using data collected by the Boston University Morphable Bio robotics Lab to develop a soft robotic biomedical device for active resistance hand rehabilitation.

Massachusetts Institute of Technology, Cambridge, MA — Summer 2018

MITES Summer

- Minority Introduction to Engineering and Science, is a rigorous and highly selective six-week program for rising high school seniors from underexposed and underrepresented backgrounds.

WORK EXPERIENCE

Ameresco, Boston, MA — Mar 2023 - present

Electrical Engineering Intern

- Assists with the design, management, and implementation of Solar PV Power projects for industrial, commercial, utility, and institutional customers.
- Developed detailed construction drawing sets in AutoCAD, including solar array layouts, Battery Energy Storage Systems (BESS), electrical one-line and three-line diagrams.

Ameresco, Framingham, MA — Summer 2022

Project Development Intern

- Contributed to the engineering, procurement, and construction of distributed energy systems.
- Engaged in legal contract review, project proposal review, preliminary pro forma and financial calculations.
- Worked on solar array design, simulation, and data analysis of PV systems, and high-level Electrical single line diagrams.

Honolua Surf Company, Paia, Hawai'i — Summer 2021

Store Manager

- Managed a local surf shop location and handled the ordering and relocation of merchandise to other stores across Hawai'i.

KUPU, Honolulu, Hawai'i — Summer 2019

Conservation Team Member

- Volunteered alongside a team, working on environmental restoration, planting and protecting native plants, and the removal and management of invasive species. AmeriCorps Education Award recipient.

University of Hawai'i, Maui, Hawai'i — 2018 - 2019

Engineering Project

- Refurbished and distributed 10 computers among low-income high school students for home use.

TECHNICAL SKILLS

Operating Systems: Mac OSX | Microsoft Windows | Linux
Hardware: FPGA Design | Arduino
Software: Excel | Vivado ML | STK | Sketchup Pro | LTspice | AutoCad | PVSyst | Helioscope
Languages: Assembly | Matlab | C | Verilog
Licensure: OSHA 30-hour training

Abdulaziz Sulimani

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EDUCATION

Bachelor of Science in Biomedical Engineering **September 2019- present**

- *Boston University*
- Relevant Coursework: *Calculus I, General Chemistry I & II, Programming, Biology, Physiology, Physics I & II, Circuits, Image and signal processing, BME device design, Thermodynamics.*

Certificate of Completion – Foundation Year Program **May 2019**

- *Boston University*
- Customized college preparatory program, designed to bridge the gap between high school and college, focusing on ESL coursework, test prep, and college-level classes.

RESEARCH EXPERIENCE

Intern; **KAUST Summer Internship Program** **2022**

- Involved in an 8-week internship in King Abdullah University for Science and technology on "Laboratory investigation of the effects of soil-amendments on evaporative loss from the top-soil" with Professor Himanshu Mishra, worked on image processing mostly using Matlab.

Lab Assistant; BOAS Lab at Boston university **2022**

- Working as a Lab Assistant in BOAS Lab at Boston University

Participant; Global Entrepreneurship and Innovation program **2021**

- Participated in a program by the university of Arizona to teach students to think in innovative and business-oriented ways, and to come up with a product by the end of the program.

PROJECTS

Building an Electric Guitar from Scratch(Engineering) **2020**

- Constructed an electric guitar from scratch for an introduction to engineering class.

Building a Low-Cost, High-Quality Drug Dispenser for Refugees" (Engineering, Arduino) **2020**

- Innovated a low-cost, high-quality, and user-friendly drug dispenser that aims to help refugees in camps who struggle to receive the right dose at the right time.
- Utilized the Arduino platform to design and develop the dispenser.

Creating a Truss that Can Support a Specific Load(Mechanical Engineering, Programming) **2021**

- Designed and built a truss that can support a specific weight.
- Developed a program to help calculate the optimal angles and lengths to maximize the load-carrying capacity of the truss.

Correlation between Heart Rate and Glucose Consumption(Biomedical Engineering) **2021**

- Conducted research on the correlation between heart rate and glucose consumption in different age groups.

Early Stage Imaging of Demyelination in the Cortex (Biomedical Engineering) **2022**

- Proposed the use of polarization-sensitive optical coherence tomography (PS-OCT) to detect demyelination in the cortex.

Investigating the Effect of 40Hz Light and 40Hz Sound on Cognitive Performance in AD Patients(Biomedical Engineering) **2022-23**

- Investigated the use of 40 Hz gamma light therapy to enhance brain cognitive ability in patients suffering from neurodegenerative diseases such as ADHD and AD.

Investigating Methods to Improve Brain-Computer Interfaces (Biomedical Engineering) **2022**

- Researched different approaches to overcome the challenge of connecting the nervous system to bionics.

HONORS & AWARDS

Recipient – *MAWHIBA GIFTED STUDENT* **2012-2018**

- Recognized as Top 1% in Saudi Arabia; chosen by multiple-cognitive Aptitude Test scores.

Recipient – *M AWHIBA Select Program* **2017-2018**

- Selected as one of 43 students chosen from Top 1% nationwide to participate in the American Leadership
- Development Program.

PARIDHI SURANA

psurana@bu.edu | (917) 348-3780
Boston, MA

EDUCATION

Boston University – College of Engineering, Boston, MA May 2023
Bachelor of Science: Biomedical Engineering, Minor: Innovation and Entrepreneurship, Concentration: Technology Innovation
- Activities: Director of Events at Boston University 180 Degrees Consulting, Biomedical Engineering Society

Courses – Intro to MATLAB and C, Engineering Design, Biomedical Signals and Controls, Business of Technology Innovation

RELEVANT EXPERIENCE

Dr Lei Liu's Lab, Brigham and Women's Hospital/Harvard Medical School - Department of Neurology July 2022 – Present
Research Assistant
- Designed tau detecting antibodies to visualize alzheimer progression in 65 patients alongside Dr Jean-Pierre
- Conducted densitometric analysis to compare abundance of tau protein in different areas of patient brain tissue in each alzheimer braak stage through ELISA and QuPath software

Boston University 180 Degrees Consulting, Boston, MA Sep 2021 – Present
Director of Events and Senior Consultant
- Analyzed donor profile and giving trends to derive overhead funding strategies leading to 3 deal closures worth $6000
- Applied PESTLE and VRIO analysis to identify issues with homeless youth's accessibility to transitional housing
- Deployed SEO changes and integrated low-barrier sign-up processes increasing transitional housing sign-ups by 23%
- Evaluated client's internal ecosystem against industry best practices and delivered findings

Aptacure Therapeutics Ltd, Hong Kong Science & Technology Park Mar 2021 – May 2021
Research Intern
- Investigated tumor-inducing properties of protein DKK1 and presented its vast potential in cancer aptamer-drug therapy
- Collaborated with a diverse 4-member team to test ability of different plasmids expressing DKK1 in bacteria and cells
- Conducted DNA library preparation and automated electrophoresis to sequence aptamers targeting DKK1

AI InnoBio, Hong Kong Jan 2021 – Feb 2021
Project Trainee
- Trained 4 spectral devices via classification and regression analysis resulting in models with 97.5% testing accuracy
- Deployed programmed functions to process spectral readings into comparative plots in MATLAB
- Transcribed scientific reports evaluating feasibility of devices for development of a low-cost, diagnostic COVID-19 kit

Professor Quan Hao's Lab, The University of Hong Kong June 2020 – Aug 2020
Research Assistant
- Planned and executed purification experiments on protein DLC1 to aid understanding of its role in melanoma growth
- Summarized SDS-PAGE gel results and implications of overexpressed regions to a 6-person research committee

PROJECTS

Self-Diagnostic Device for Leg Length Discrepancy (LLD) Sep 2022 – Dec 2022
- Constructed a non-invasive and instant results-providing device, in a team of 5, after in-depth assessment of existing products and gaps in market
- Interviewed 2 orthopedic surgeons and 3 industry leaders to innovate an economically and surgically viable product

Modeling Risk for Coronary Heart Disease (CHD) Sep 2020 – Dec 2020
- Applied MATLAB machine learning algorithms to create a predictive model evaluating an individual's risk for CHD
- Collected over 20,000 data points and coded a data scrubbing mechanism to obtain a logistic model with 85.2% accuracy

AFFILIATIONS

Touch A Life Foundation HK Ltd, Hong Kong Aug 2017 – Present
Digital Media Volunteer & Medical Bootcamp Project Manager
- Developed 3 portfolios of 550 photographs to provide complete coverage of service trips around Maharashtra, India
- Launched and managed a medical boot-camp project, providing annual health consultations to over 580 students
- Led development of an electronic medical record solution for over 5000 students

SKILLS

Technical Skills: *MATLAB, C, Microsoft Office Suites (Word, Excel, PowerPoint), Onshape, Adobe Illustrator/Photoshop*

Stephen Sweet

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ssweet@bu.edu /stephensweet

Education

Boston University Expected May 2023
Double Majoring in Computer and Biomedical Engineering with a concentration in Machine Learning *Boston, MA*

- Biomedical Engineering Society, Vice President of Club Soccer, SHPE

Experience

Stem Pathways May 2022 – Dec 2022
Engineering Researcher, iGEM Team Lead, CIDAR Lab *Boston, MA*

- Developed an automated aquatic synthetic biological system implementing biosensors and microfluidics
- Developed a kiosk web application to automate the device with a Raspberry Pi
- Manufactured custom-made machine parts and electronic PCBs for the device
- Touchscreen control panel and removable panels to access device interior
- Built and designed website to showcase research. Link: https://2022.igem.wiki/bostonu-hw/

Ultrafast Lab Feb 2022 – May 2022
Research Assistant *Boston, MA*

- Designed image registration algorithm for image overlap when using different microscopy techniques
- Implemented efficient subpixel image registration algorithms, DFTregistration

Harvard Medical School Feb 2021 – May 2021
Research Assistant *Boston, MA*

- Conducted Data Analysis for therapeutic agent to combat co-morbid Traumatic Brain Injury and Alcohol Use Disorder
- Various mice tests used, focused on Y-maze and DigiGait mice performance data

Projects

Bioinformatics RNA-seq Data Pipeline with Draper- Senior Design Project Sep 2022 - Current

- Processing Raw Sequencing Data, up to 5TB, from NIH and in-house (PREDICT96 Results)
- Performing Single-cell and bulk RNA-sequencing analysis, and further downstream analysis with DEGs
- Developing a Ranking system for top changes datasets
- Highlights: R, Cellranger, Seurat, NCBI GEO, t-SNE

Cloud Computing Project with Apple - Encrypted Search over FoundationDB Sep 2022 - Dec 2022

- Created a client side interface to the FoundationDB database to support encrypted search
- Modified Clusion and DORY Algorithms to read and write to FoundationDB's client library
- Highlights: Golang, Databases, End-to-End Encrypted File Sharing, IaaS

saSBOL Web Application

- Designed a web app to optimize SBOL Canvas Scar functionality
- Built with jQuery, Flask, MySQL, Bootstrap, Deployed with Docker and Heroku PaaS
- Highlights: SynBio, Parsing Massive XML Files, DevOps skill development

Genetic Circuit Optimized Designer

- Python API that implements Cello v2 to allow for user customization in designing a genetic circuit with a bacterial library
- Highlights: Docker, JSON files, GUI, Verilog

Skills

Traits Hardworking, Leader, Creative, Problem-Solving, Persistent, Oral Communication
Training Bio-safety Level 2, Blood-borne Pathogen and Coronaviruses, Recombinant DNA/IBC Policies
Software Python, Matlab, C++, C Sharp, Java, Go, Shell Scripting, R, Cloud Computing, Data Pipelines, HTML, CSS, Docker, GIT, Linux, SQL, SOLIDWORKS, AutoCAD, REST API

KSENIJA TASICH
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EDUCATION

Boston University College of Engineering | Boston, MA Expected May 2023
B.S. in Biomedical Engineering; GPA: 3.85/4.00 (Dean's List)
Relevant Coursework: Quantitative Neuroscience; Computational Biology; Biomaterials; Device/Diagnostic Design
Commitments: Treasurer, Tau Beta Pi Engineering Honors Society; Member, Biomedical Engineering Society (BMES); Captain, BU Club Tennis

WORK EXPERIENCE

U.S. Dept. of Veterans Affairs Diversity, Equity, & Inclusion Initiative | Boston, MA
Clinical Research Intern May 2022 - Sep 2022

- Designed and built a novel multispectral illumination device using super luminescent diodes with wavelengths in visible and near infrared to deliver light through fiber optic bundle into the biopsy channel of an endoscope.
- Developed GUI for end users using Python to save instrument settings and sequentially alternate diode output for video data collection from colonoscopies for image analysis and AI pattern recognition.
- Presented work at 2022 Annual Biomedical Research Conference for Minoritized Scientists in Anaheim, CA.

Boston University Biomedical Optics Lab | Boston, MA
Research Assistant Feb 2021 - Present

- Conduct direct research under a Senior Research Scientist for the development of a minimally invasive device that quantifies renal fibrosis and tubular atrophy using elastic scattering spectroscopy (ESS).
- Statistically modeled spectral signatures obtained with ESS and correlated data to pathology results to diagnose stages of Chronic Kidney Disease (CKD) in MATLAB.
- Coded in Arduino IDE to control different spectrometers; created custom printed circuit boards; built optical probes; wrote device assembly instructions and operation manual for physicians.
- Presented results at symposium for Undergraduate Research Opportunities Program in Summer & Fall '21.

Boston University | Boston, MA
Teaching Assistant – "Intro to Engineering Design" and "Hands on Engineering" Sep 2021 - Aug 2022

- Provided instruction and supervision with circuit wiring and projects in the machine shop operating laser cutters, mills, drill press, and 3D printers during class.
- Held weekly office hours to aid team project development, offer feedback on assignments, and grade quizzes.

Learning Assistant – "General Chemistry I" and "General Chemistry II" Sep 2020 - May 2021

- Led recitation sessions and supported collaborative group work with fellow graduate teaching assistants.
- Participated in weekly faculty meetings to review lesson material and optimize course quality.

PROJECTS

Senior Design Project: Panoramic Camera for the Detection of Colorectal Cancer Sep 2022 - May 2023

- Designing a biocompatible multispectral illumination and imaging device that rotates 360˚ to detect abnormal polyps along the rectal canal.
- Developing a software to sequence through wavelengths, acquire images, and display the stitched panoramas for automated polyp detection and classification.
- Modeling pigmented silicone and titanium dioxide based phantoms resembling rectal vasculature and structures simulating polyps to test device.

Neuropathy Aid Prototype Jan 2022 - May 2022

- Innovated compact, affordable, and comfortable device minimizing pain from peripheral neuropathy in feet.
- Included adjustable treatment levels and safety features of transcutaneous electrode stimulation, red light therapy, and heating pads controlled with a smartphone.
- Created CAD models with Solidworks; constructed physical and mathematical models to test performance.

Urea Detecting Sweat Patch for CKD | BU BMES Design-A-Thon Jul 2021

- Devised a wearable patch for patients with CKD in a team of four; developed gold nanoparticle strip to indicate urea volume in sweat through color change and be scanned for real time result analysis.
- Medical device category winner.

SKILLS & CERTIFICATIONS

Technical: MATLAB, Python, C++, ImageJ (FIJI), Solidworks, OnShape, EAGLE, Excel
Certifications: Privacy and Information Security; Tech Transfer; HIPAA; Government Ethics | U.S. Dept. of V.A. Human Research; Biosecurity | Collaborative Institutional Training Initiative (CITI) Program
Languages: Russian (proficient), Serbian (proficient)

Jeannine Tong

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EDUCATION

Boston University College of Engineering Boston, MA
Bachelor of Science in Biomedical Engineering May 2023
Minor in Mathematics
GPA: 3.53/4.00

Relevant Coursework: Molecular Bioengineering | Transport Phenomena in Living Systems | Principles of Molecular Cell Bio and Biotech | System Physiology | Biomedical Signals and Controls | Intro to Biomedical Materials Science | Biomedical Measurements II

WORK EXPERIENCE

Nia Lab Summer Research Volunteer May – August 2022

- Fabricated polystyrene plastic shells using vacuum-forming techniques and molded PDMS ring involving desiccation, degassing and oven-curing for use in lung surgeries.
- Traced and annotated chronic obstructive pulmonary disease (COPD) alveoli and capillary dimensions in confocal microscope images with ImageJ, and presented batch data in JMP software.
- Practiced cell culture techniques such as blood isolation, cell passing, and cancer cell media changing.

PROJECTS

Mechanical Mitral Heart Valve Prosthesis Design March – May 2022

- Executed a fatigue failure analysis of tilting-disc valves implemented in patients with rheumatic heart diseases to ascertain causes led to high rates of failure at welding points.
- Innovated a materials-based design to tackle problem of thrombosis due to failed struts.
- 3D modeled proposed prosthesis and conducted cost benefit analysis to ensure feasibility.

Microscope Image Capture Analysis February – March 2022

- Captured images with digital camera microscope to explore contrast mechanisms via light scattering and absorption, and referenced image scale with USAF resolution target.
- Classified RGB microscope images using MATLAB to detect and count red/white blood cells.
- Conducted 2D Fourier analysis and sharpened/blurred images with convolution filters.

Binary Classification Algorithm Model April – May 2021

- Categorized 2000 images into training and test data to produce error rates for binary classification models.
- Explored perceptron, nearest neighbor algorithm, principal component analysis, and linear discriminant analysis in MATLAB to perform object recognition.

Arduino-Based Pulse Oximeter Design September – December 2020

- Constructed an Arduino-based pulse oximeter prototype to employ wireless transmission and receiving of data to tackle overcrowding issues at medical facilities during the COVID-19 pandemic.
- Drafted detailed engineering sketches and prototyped casing of pulse ox with CAD for 3D printing.
- Presented mathematical models for power requirements, battery life, and response time.

Motor Vehicle Fatality Rate Analysis March – April 2020

- Employed MATLAB Machine Learning Toolbox to scrub and analyze a large data file which contains over 10,000 data points to determine environmental and human factors which contributed to accidents.
- Collaborated with team of three engineers to investigate a country-wise car accident dataset and proposed ways to reduce traffic fatality by analyzing plots graphed from datasets.

SKILLS

Tools: MATLAB, Python, C/C++, Microsoft Office, Fiji (ImageJ)
Laboratory: Molecular cloning techniques, Polymerase chain reaction, Chromatography, Light/Fluorescence Microscopes (EVOS), Optical/Fluorescence Spectroscopy

Dea Turashvili

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EDUCATION

Boston University College of Engineering Boston, MA
Masters of Engineering, Biomedical Engineering Expected May 2024

- GPA: 3.65/4.00, Dean's List Fall 2023
- Richard C. Cohen Scholarship Recipient

Relevant Coursework: Signals and Modern Controls, Biomechanics, Biomedical Materials, Device and Diagnostic Design, Thermodynamics, Systems Physiology, Clinical Applications to Biomedical Design

EXPERIENCE

BU STEPP Lab Boston, MA
Research Assistant Sep 2021 - Present

- Automated analysis of autonomic nervous system activity for varying anatomic locations.
- Liaised between the STEPP Lab and co-developed an effective team
- Collaborated on writing a research paper and conference paper that are waiting for peer review
- Analyzed human electrodermal activity with MATLAB by formulating a user-friendly automated software customized to the collection location: forehead, chest, fingertips, and shoulders
- Performed statistical, qualitative, and quantitative analysis using MATLAB and Praat to extract usable data
- Collaborated with 10 research participants to collect autonomic nervous system and speech data

SELECT PROJECTS

SyncoStrap Sep 2022 - Present

- Programmed an algorithm compatible with Arduino Uno, ECG transducers and leads, an accelerometer, temperature sensor, and humidity sensor to predict episodes of syncope in populations vulnerable to falls
- Fabricated a looks-like prototype of a chest strap from raw materials
- Led a team of 5 engineers to jumpstart needs finding and managed deliverables via G-suite
- Proposed a cost analysis and pitched a funding request for SyncoStrap

Pulse Oximeter Sep 2020 - Dec 2020

- Engineered a pulse oximeter prototype for triaging COVID-19 patients in an overworked hospital
- Designed a program employing C++ on Arduino to analyze photoplethysmographic data and produce a heart rate reading, oxygen saturation reading, and triage category

Additional Projects: Truss Bearing 12 lbs Weight, MetaData Analysis of Comorbidities of Mental Health Conditions in 100,000 participants, Machine Learning Algorithm to Categorize Images of Pets

SKILLS & CERTIFICATIONS

Lab: SpectraMAX Multimode Plate Reader, PCR Thermocycler, Centrifuge, Gel Electrophoresis, Micropipetting, Benchtop Compound Microscope, Band Saw, Miter Saw
Computer Skills: MATLAB, Autodesk AutoCAD (Certified), Arduino
Languages: Georgian, Russian

LEADERSHIP & COMMUNITY SERVICE

Board Secretary, Georgian-American Women's Association Oct 2020 - Present
Treasurer, Dancer, and Choreographer, BU EDGE Dance Company Sep 2021 - Present
EMT-B, Fallon Ambulance Sep 2020 - Oct 2021
Communications Volunteer, Hunger Free America May 2021 - Aug 2021
Food Pantry Volunteer, NYCares May 2021 - Aug 2021
VP of Marketing, BU Campus Activities Board Sep 2019 - Jan 2021

Esha Vaishnav

Interested in sharing knowledge in the engineering field and utilizing skills in machine learning and software engineering to provide solutions to medical issues and research.

Email: eshav@bu.edu
Mobile: (925) 725-5377

EDUCATION

Boston University – **College of Engineering** — Boston, MA
Bachelor of Science in Biomedical Engineering — *Expected May 2023*
Courses – Probability Statistics and Data Science, High-Performance Programming with Multicore/GPU, Digital Image Processing, Intro to Learning From Data (Machine Learning Algorithms), Biomedical Signals and Controls, Device Diagnostics and Design

EXPERIENCE

BITLab (Business Insights through Text) — Boston, MA
Machine Learning Research Assistant — *Jan 2023 - Present*

- Studied development of NLP to extract consumer behavior and market insights, specifically in medical device industry
- Developed in environments such as JupyterLab and Colab to implement TensorFlow algorithms to draw patterns from large text datasets
- Studied long-term impact of new machine learning technology (GANs, NLP, Deep Learning) on consumers and businesses and presented findings

iDTech — Boston, MA
MIT Camp Engineering Instructor — *Jun 2022 - Aug 2022*

- Applied background in computer programming to lead camps located in the Massachusetts Institute of Technology (MIT) as an instructor at iDTech
- Selected as lead instructor for pilot course known as Artificial Intelligence using MIT App Inventor to 20+ students
- Taught additional courses including Machine Learning with Python TensorFlow and Creative Design Studio with Adobe Animate

PROJECTS

Word Importance Classification in Debate Cards — Boston, MA, *Nov 2022*

- Employed NLP algorithms (BERT and Word2Vec) to develop classification algorithms to highlight word importance in debate articles, applying ML algorithms such as Stochastic Gradient Descent (SGD)
- Wrote paper with team of 3 and presented impact and outcomes of project

Smartphone-Detection of Skin Cancer — Boston, MA, *Oct 2022*

- Utilized Harvard-provided HAM-10000 dataset to train CNN model to create easy-to-use smartphone-based detector of skin cancer using Flutter
- Led programming team during application development
- Collaborated with a team to efficiently build working product in 24 hours

Born Global Competition Winner — Boston, MA, *May 2022*
Urban Planning with Modified Mycelium Bricks

- Awarded for making a creative engineering solution to a real world sustainability problem through strategic planning and brainstorming
- Project focused on implementation of mycelium brick walls for soundproofing structures to promote plant growth nearby

TECHNICAL SKILLS

Programming Experience: Python (TensorFlow), C, C++, Java, Javascript, SQL, MATLAB
Tools Experience: AutoCAD, Linux, Visual Studio, SolidWorks, Adobe Software (Photoshop, Premiere, Animate)

Ashraye Vallabhaneni

175 Freeman St Brookline MA| c: 847-902-5717 | avallab@bu.edu

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Education:

Boston University. B.Sc. in Biomedical Engineering **May 2023**

Coursework: Engineering Mechanics / Electric Circuits / Systems Physiology/ Signals and Controls/Photonics/Biomedical Measurements/Probability, Statistics, and Data Science/Biomedical Materials Science/Programming for Engineers/Transport Phenomena in Living Systems/Devise Diagnostics and Design/ Fluid Mechanics /Thermodynamics/ Quantitative Neuroscience/Biomedical Senior Design Project/Evolution/Animal Behavior/Global Health

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Projects:

- Designed and built pulse oximeter (measures oxygen saturation in blood) using CAD model/Arduino IDE software
- Constructed hardware for filters and Bode plots
- Created a Machine Learning-design classifier for cat and dog images
- Developed and tested Speech therapy app for autistic children

Adlai E. Stevenson High School, Lincolnshire, IL **May 2019**

- AP Scholar with Honor Award, Stevenson Honor Roll Award
- IHSA North Suburban Conference (NSC) Basketball Champion Award
- USA Powerlifting (USAPL) - Qualified for Nationals Men's Raw Novice Class

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Work Experience:

Henkel/Sonderhoff, Elgin, IL Technical Engineering Intern **June 2022 - August 2022**

- Collaborated with an engineering team to explore product applications, systems, process, and innovation in adhesives and FIP industry
- Researched customer needs and supported developing new product features to meet those needs
- Explored new materials and techniques for bonding and sealing
- Worked with colleagues with sales division to sample orders for companies looking to invest in Sonderhoff machinery

Cellorama, Milton, MA Biomedical Engineering Intern **March 2022 - June 2022**

- Designed new engineering drawings for new products, discussing best biomedical materials for current products, and creating other deliverables to present at Advanced Therapies Expo in London
- Supported studies related to developing graphs to visualize data for CellO-M
- Worked collaboratively with an R&D team researching on liver cancer stem cells in a lab setting

Kidnectivity, North Brook, IL Volunteer/Intern **August 2018 - May 2019**

- Interacted with children with functional limitations and assisted in improving endurance, motion, strength, and motor skills
- Assisted in formulating effective pediatric development, occupational and physical therapy
- Implemented personalized plans to enhance child's cognitive development, physical and therapeutic skills to be as independent as possible and reach full potential

AbbVie Pharmaceuticals, Abbott Park, IL Summer Intern Data Analyst **May 2018 - August 2018**

- Collaborated with group members to perform data analysis and validation using EXCEL task including cleaning and organizing date, creating charts and graphs, and statistical analysis for trend monitoring
- Presented project summary and conclusions of data analysis at management meetings

Sumner Warden

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EDUCATION

Boston University College of Engineering
Bachelors of Science in Biomedical Engineering
GPA: 3.67/4.00

RELEVANT COURSEWORK
Engineering Design | Mechanics | Computational Programming | Differential Equations | Linear Algebra | Circuits | Probability | Science Education | Software Engineering | Business of Technology Innovation

PROJECTS

Draper Laboratory September 2022 - Present
- Data Analysis and Bioinformatics for Predict96 project

Monroe Water Project, Community Engineering Corps, *Project Lead* August 2021 - June 2022
- Analyzed existing system and redesign water filtration system of hourly flow of gmp for town of Monroe, MA
- Managed a team of six engineers, coordinated with three major stakeholders, designed and documented feasibility of system and oversaw cost-management of design components

Pulse Oximeter, Engineering Design Class January 2021 - May 2021
- In a team of five, designed and developed a self use pulse-oximeter for COVID-19 patients removing the need for an administrator and freeing up hospital personnel

Temperature Monitor, Engineering Design Class September 2020 - December 2020
- Built, circuited, and coded a temperature monitor with 98% accuracy using computer aid design, 3D printing, and arduino uno board and software

EXPERIENCE

CNY Fertility Colorado Springs, CO
Clinical Assistant July 2022 - August 2022
- Oversaw embryonic fertilization and planned new medical device implementation

Boston University Boston, MA
Teaching Assistant August 2021 - August 2022
- Organized and taught discussion sections for general physics for three terms
- Developed lecture planning with head of department, implemented learning goals, communicated with and organized fellow teaching staff

Children's Hospital of Orange County Orange, CA
Medical Innovations Intern May 2021 - August 2021
- Planned and attended seminars on technology and artificial intelligence in medicine
- Created an abstract for a medical device utilizing AI and submitted to national conference
- Presented at grand rounds and multiple continuing medical education seminars

The Business Law Group Newport Beach, CA
Associate Consultant January 2015 - January 2020
- Monitored financial operations and liaison between partners and clients

RAND Sleep Research Newport Beach, CA
Intern May 2019 - August 2019
- Developed white paper and lit search and reports to assist in upcoming research

ACTIVITIES AND VOLUNTEER

Girls Who Code Boston, MA
Facilitator and Curriculum Development Chair September 2020 - June 2022
- Managed programming education for thirty 2nd-3rd grade students

BU Society of Women Engineers

SKILLS

Software: C++, MATLAB, CAD, Python, LabVIEW, Microsoft Office, Javascript, Arduino

Nicholas Wayhs

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EDUCATION:
College: Boston University

Expected January 2024
- Biomedical Engineering Major
- Relevant Coursework: Systems Physiology, Organic Chemistry, Thermodynamics & Statistical Mechanics, Device Diagnostics and Design, Biomedical Signals and Controls

EXPERIENCE:

June 2016-May 2018
Volunteer, Methodist Charlton Medical Center
- Help staff the front desk and information booth at the Cardiac Catheterization Lab, Main Admitting, and dealt in direct patient care on Nursing Floors A3, A4, and CDU

September 2021-May 2022
Volunteer, Massachusetts General Hospital
- Worked on outpatient documentation and aiding patients.

February 2022-September 2022
Intern, Cognitive Neuroimaging Lab at Kilachand Center for Integrated Life Science and Engineering
- Performed Data Analysis and Worked with Subjects During Testing

PROJECTS:

Senior Design
Dynamic Multilayered and Shortwave Infrared Range Optical Phantoms
- Worked to create multilayered optical phantoms to simulate human tissue.
- Programmed an Arduino and an LCD to create a more "dynamic" simulation.
- Engineered novel phantoms to be used in the SWIR range.

Probability, Statistics, and Data Science
Pet Classification Challenge
- Developed a machine learning algorithm to differentiate photos of cats and dogs and classify them appropriately.

WORK:
- **May-August 2019**
  Usher, Cinemark
- **June-Present 2022**
  Waiter, Gyu-Kaku

SKILLS:

Computer: MATLAB, SolidWorks, C, C++, Python, Arduino, Microsoft Word, Excel, and PowerPoint
Lab: Gel Electrophoresis, DNA extraction, Spectroscopy, Pipetting
Languages: English, Portuguese
Hobbies: Skiing, Chess, Writing

Grant David Winkey

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EDUCATION

Boston University College of Engineering **September 2019 - Present**
Bachelors in Biomedical Engineering Boston, Massachusetts
Pre-med; minor in biology

- **Current GPA**: 3.4
- **Relevant Coursework:** General Chemistry I/II, Calculus I/II, Multivariable, Physics I/II, Organic Chemistry I/II, Biochemistry, Systems Physiology, Thermodynamics, Fluid Mechanics, Nanotechnology, Probability and Statistics, Molecular Bioengineering, Developmental Biology, Development and Diagnostic Design, Biomedical Material Science

The Blake School **September 2015 - March 2019**
Diploma Minneapolis, Minnesota

- **Advance Placement / Honors:** AP Physics I, AP Physics C, AP Calculus, Honors Chemistry, Honors Pre-calculus, Economics CIS

WORK EXPERIENCE

Synthera Health **Fall 2022 - Present**
Product Design Intern Boston, Massachusetts

- Researched current advancements and procedures for synthesizing microneedle arrays.
- Collaborated with a team of four to construct hollow microneedle arrays for drawing blood.
- Tested multiple iterations of microneedle arrays through the application of research and design strategies.
- Synthesized and Tested microfluidic channels for the transferring of blood throughout a diagnostic device
- Adhered to FDA regulations for invasive medical devices.

Boston University, Bradham Lab **Spring 2022 - Present**
Undergraduate Researcher Boston, Massachusetts

- Managed multiple individual projects with focus on the microinjection of different morpholinos, mRNAs and DNAs in fertilized sea urchin embryos.
- Created retro viruses for controlled infection of embryos with mRNA of choice as a substitute for microinjection.
- Assisted PhD students with their projects in the areas of synthetic biology.
- Led and participated in weekly progress meetings regarding relevant and ongoing research. Skills include teamwork, collaboration, and problem-solving.

Atrius Health **Summer 2022**
Pre-med Student Shadowing Boston, Massachusetts

- In-person shadowing in the following clinical areas: Orthopedics, Pathology, Ears/Nose/Throat
- Shadowed health care doctors to learn their career paths and day to day responsibilities from notetaking, testing, diagnosing and treatment protocols.

PROJECT EXPERIENCE

RenUV: Surgical Tool Sterilization Project **Fall 2022 – Spring 2023**
Research and Development Boston, Massachusetts

- Conducted rigorous background research on the current methods and requirements for surgical tool sterilization.
- Designed a functional, sustainable, and self-sufficient Ultraviolet-C sterilization device for low resource environments requiring sterile surgical tools.

Heart Rate/Pulse Oximeter Engineer Project **Winter 2020 - Spring 2021**
Project Leader Boston, Massachusetts

- Managed a team of 4 BU students to design and build a functioning heart rate/blood O2 monitor.
- Actively participated and guided the team while reviewing their performance in the research, design, construction, and program writing process.

Shawn H. Xu

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Education

Boston University, *Boston, MA* *Expected May 2023*

- Bachelor's of Science degree in Biomedical Engineering, Started in September 2019.
- Overall GPA: 3.47/4.00 – Dean's List of Academic Honor.

University of Michigan Python Coursera Online Course

- "Python Basics" taught by University of Michigan Professor Paul Resnick, assistant professor Steve Oney, and lecturer Jaclyn Cohen.
- Course certificate received on September 2nd 2022.

Experience

Staidson BioPharma Internship, *Richmond, CA* *June 2018, June - Aug 2021*

- Assisted in researching about protein design: cultured cells, purified plasmids, purified other proteins, created solution buffers, helped program a robot intended for lab work and liquid solution handling.
- Assisted in plasmid digestion, ligation, and transfection.

Ebert Lab at Dana Farber Cancer Inst./Harvard Medical School, *Boston, MA* *May - July 2022*

- Cooperated and conducted experiments with Harvard PhD candidate Yender Li (MD), under principal investigator Benjamin L. Ebert's (MD, PhD) guidance.
- Studied structural functions of degraders through functional proteomics and genomics. Projects included profiling synthetic degraders on degradation and proteomics.
- Developed techniques such as Western Blotting, Western Blot Wet/Semi-dry Transfer, Plasmid Transfection and transformation, cell culturing, Co-Immunoprecipitation, Protein Imaging.
- Co-authored a publication on Nature in relation to my work. https://doi.org/10.1101/2023.02.14.528208.

Projects

Analytical Truss MATLAB Code

- Constructed a MATLAB program to analyze truss practicality and profiling mechanics of load bearings on different truss designs.
- Conducted, analyzed, and generated code in a team of three.

Public Health Data Science Project

- A project conducted during a "Data Science in R" (MA415) course in a team size of four classmates.
- Explored, analyzed, and evaluated many health outcomes of different demographics to find evidence for inequalities within American healthcare systems.
- Performed data cleaning, analytics, and visualizations/interactive.

Chaikof Lab at Harvard Medical School - *Biomedical Engineering Senior Design (Ongoing)*

- Redesigned blood vessel bio fabrication prototype. Streamlined its collagen sheet extrusion setup, automated rolling setup, and integration of endothelialization onto a user-friendly platform.
- Produced novel blood vessel grafts through modifications of fabrication parameters, tested for materials organization, bulk mechanical properties, and vascular cell distribution.
- Tested reproducibility, potency, and reliability of revised bio fabrication infrastructure.

Skills

MATLAB | Python | R programming | Wet Lab Work | Statistics | Arduino | Data Science | Excel | Biomedical Design | Microscopy | Leadership and Collaboration | Mandarin | ELISA

Chenkai Yao

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EDUCATION

Boston University | Boston, B.A. Expected May 2023
B.A. in Biomedical Engineering

- GPA: 3.69

Coursework

- Machine Learning
- Optical Spectroscopic Imaging
- Molecular and Cell Biology
- Data Science
- Thermodynamics
- System Physiology
- Control System
- Solid/Fluid Biomechanics
- Neuroscience

PROJECTS

Integrated Platform for Cell Analysis | Boston University Sep 2022 – present

- Design an interface integrating image analysis functions by programming with Python and Shell script.
- Collaborate with neuroscience lab researchers for collecting performance data and suggestions.

T-lymphocyte Activation Signal Effect | Imperial College of London Summer 2022

- Examine biomarkers CD3, CD25, CD69 by flow cytometry and cytokines IL-2, IL-15 by ELISA.

COURSEWORK

Data Application Spring 2022

- Lead project group in building and publishing an R web application about teenager's migration status.

Design Pulse Oximeter Spring 2021

- Design circuits, algorithms, and device schematic on MATLAB, Arduino, and CAD.
- Construct device with 3D printing.

EXPERIENCE

Teddy Clinical Research Lab | Shanghai, China Summer 2021
Research and Commercial Business Team Intern

- Coordinated with lab and business team to develop lab manual for vaccine clinical trial.

International Peace Maternal and Child Hospital | Shanghai, China Summer 2019
Clinical Lab Assistant

- Performed nucleic acid hybridization assay to detect Trichomonas, Gardnerella, and Candida.
- Reported patients' testing results on hospital system.

HONORS & AWARDS

Boston University | Boston, MA

- Deans' list (Fall 2020, Fall 2021, Spring 2021, Fall 2022).

LEADERSHIP & ACTIVITIES

Vision Academy| Shanghai, China
Academic Assistant Summer 2020

- Tutor over 10 high school students in high-level Calculus, Physics, and English.

Science Camp Volunteer| CA Summer 2019

- Collaborate with 20 volunteers to lead students from 2 elementary schools attending science camp.

SKILLS

Programming: MATLAB, Python, R, Java, Shell script (bash, batch), html.
Tools: ImageJ, CellProfiler, CAD, Office Tools (Words, Excel, PowerPoint), Photoshop, Illustrator Laser cutting, 3D printing, Circuits design.
Lab: Cell culture, ELISA, Flow cytometry, Microscopy.

Jin Yoon

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Education

Boston University, College of Engineering **Expected May 2023**
B.S.Computer Engineering & Biomedical Engineering with Concentration in Technology Innovation
Honors: Trustee Scholarship (Full Ride to Boston University)
GPA: 3.60/4.0
Coursework: Data Structures/Algorithms, Data Science, Machine Learning, Cloud Computing, Computer Networking
Activities: Resident Assistant, VR/AR club, Society of Asian Scientists and Engineers, BU Consulting Group
Certifications: AWS Certified Cloud Practitioner

Experience

Draper **Boston, MA**
Student Researcher Aug 2022 – Present
- Led a team of 4 Undergraduate researchers to create a Bioinformatics pipeline for RNA-seq data from high throughput organ-on-chip platform
- Devised R scripts to perform downstream bio-informatics analysis on the single and bulk cell RNA datasets
- Applied statistical methods such as regression analysis and other machine learning methods perform analysis on Drapers in house data sets

J.P Morgan & Chase Co. **Houston, TX**
Software Engineering Intern - Full Stack June 2022 – Aug 2022
- Developed and implemented data visualization features for the internal trading validation system, improving the accuracy and efficiency of data analysis
- Spearheaded the creation of a dynamic file reading API that efficiently loads and displays trading messages in the UI, resulting in faster decision-making
- Devised an API that seamlessly integrates with multiple UAT servers, enabling the extraction of log file paths with ease, optimizing system performance

Boston University Computational Imaging Systems Lab **Boston, MA**
Deep Learning Research Intern Aug 2021 – May 2022
- Led a team in the successful implementation of a deep learning algorithm based on the U-Net structure, which accurately identifies alveoli in OCT images of the lung
- Refined and optimized a denoising algorithm utilizing the U-Net Model and Noise2Void techniques, resulting in improved accuracy and clarity of medical images and contributing to advancements in the field of medical imaging

Korean Culture Based Safety **Seoul, South Korea**
Safety Strategy Intern May 2019 – July 2021
- Conducted comprehensive statistical analysis of workplace injuries across major conglomerates, identifying key trends and patterns to inform injury prevention strategies

Projects

Boston University Collaboration with iCloud **Boston, MA**
Encrypted Search over FoundationDB Aug 2022 – Present
- Designed a client side interface to the FoundationDB database to support encrypted search
- Developed a API describing queries that interact with the Clusion library contains containing several algorithms

Leadership

Boston University AR/VR Club **Boston, MA**
Vice President Aug 2022 – Present
Boston University College of Engineering **Boston, MA**
Course Assistant Probability, Statistics, and Data Science for Engineers (EK381) Jan 2022 – Present
Boston University Residence Life **Boston, MA**
Resident Assistant Aug 2021 – Present

Skills

Expert: C++, SQL, HTML, Git/Terminal, JavaScript (React), C, Java, Python, Matlab, Typescript
Proficient: Machine Learning, Tensor Flow, Data Analysis/Visualization, AWS, Linux

Amy Zeng

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Education

Boston University, College of Engineering Boston, MA
Bachelor of Science in Biomedical Engineering Expected August 2023

- Cumulative GPA: 3.55/4.0 (Dean's List: 3 Semesters)
- Relevant Coursework: Mechanics, Engineering Design, Physics, Programming, Physiology, Sociology

Projects

Senior Project: "Device to Assess Closed-loop Reaching in Children with Motor Disability" Sep 2022 – Present

- Coordinate with team of 4 engineers to develop a child-friendly device to measure contributions of proprioceptive deficits to reaching difficulties in children with cerebral palsy.
- Draft prototype using CAD and program device components using MATLAB and Arduino to synchronize data collection and device movement during arm reaching task.

Artificial Hip Implant Research Project Feb – May 2022

- Collaborated in team of 5 to propose potential implant materials for ACME Orthopedics Inc. to reduce total hip implant failure rate among patients.
- Hosted weekly team meetings; enabled members to make contributions to ensure completion by deadline.
- Created report outlining failure analysis, health impacts, and final recommendations.

Systems Physiology Research Paper Sep – Dec 2021

- Conducted a research study to identify relationship between music and heart rate on stress levels during college examinations, in team of 4.
- Collected ECG data from 40+ students and consulted with TAs to optimize data collection and analysis.
- Wrote MATLAB codes to plot and visualize collected data to determine trends.

Additional Projects: Pet Image Classification Model, Human-Powered Electricity Generator, Truss Design and Analyzation Program, Lightweight Airplane Wing Foil

Skills

- **Laboratory:** Experimental Design, Data Analysis, Microscopy, Pipetting, Specimen Handling, Assays
- **Software:** MATLAB, C++, Arduino, Computer Aided Design, Microsoft Office Suite, Google Suite
- **Languages:** French, Mandarin

Experience

Boston University, Mathematics & Statistics Department Boston, MA
Grader Sep 2022 – Present

- Grade weekly class quizzes and assignments for 100+ students over course of a semester.
- Communicate with faculty, teaching assistants, and students regarding regrade, exams, and course timelines.

Boston University, Center for Psychiatric Rehabilitation Boston, MA
Office Assistant Sep – Dec 2022

- Provided client support regarding rehabilitation programs both in person and over phone.
- Mediated timely communication between clients and staff through regular correspondence.

New England Aquarium, Rescue and Rehabilitation Department Quincy, MA
Volunteer Oct 2021 – Dec 2022

- Cooperate with biologists and interns in practicing sea turtle husbandry in a hospital setting.
- Assist veterinarians in administering medications and comforting turtles undergoing examination or treatment.
- Manage, input, and track animal feeding and health data for aquarium's database systems using Tracks Software.

Camila J. Zhan Jin

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EDUCATION

Boston University - College of Engineering *Expected May 2023*
Bachelor of Science in Biomedical Engineering | GPA: 3.53 / 4.00
Academic Coursework:

- Device Diagnostics and Design (Arduino, AutoCAD), Medical Imaging (Python), Neuroengineering, Software Engineering (C++, MATLAB), Research Fundamentals (IBM SPSS), Signals and Controls.

EXPERIENCES

Senior Design – *Department of Biomedical Engineering, Boston University* *Sep 2022 – Present*

- Developed and fabricated a laryngoscope attachment connecting to suction sources.
- Created a negative pressure environment in airway to reduce exhaled pathogen exposure.

Research Assistant – *Department of Ophthalmology, Boston University School of Medicine* *Jun 2022 – Present*

- Examined SBF-SEM images of Primary Open Angle Glaucoma eyes to inspect anatomical differences.
- Constructed cells, nucleus and vacuoles with Reconstruction and Amira software.
- Organized and backed up more than 40 terabytes of lab files and created a spreadsheet to track files.

Research Assistant – *Department of Chemistry, Stony Brook University* *Jan 2020 – Mar 2020*

- Studied nanocellulose samples for environmental applications with conductometric titration.
- Synthesized cellulose, wet membranes, and calculated densities and tensile to remove fluoride ions.

PROJECTS

Smart Shoe Insole *Sep 2022 – Dec 2022*

- Engineered a high-precision shoe insole instantly diagnosing leg length discrepancy.

Truss Design Project *Feb 2022 – May 2022*

- Programmed a MATLAB code to simulate truss designs to determine ideal critical buckling load.
- Built a truss capable of withstanding 40 ounces while satisfying given specifications.

Skiing Aid *Jan 2021 – May 2021*

- Constructed and devised a skiing aid minimizing discomfort and pain from arthritis.

Automated Anticoagulation Monitoring for ECMO *Sep 2020 – Dec 2020*

- Designed an upgraded ECMO reducing likelihood of major bleeding and thrombosis.
- Analyzed automated administrations of aPTT and TEG tests.

LEADERSHIP

Teaching Assistant in General Chemistry – *Stony Brook University* *Aug 2020 – May 2021*

- Led and planed two weekly recitation sessions and held office hours.
- Provided weekly constructive feedback based on assignments and quizzes.
- Volunteered to conduct review sessions to help students prepare for midterms and final.

Student Government President – *Emma Lazarus High School* *Sep 2018 – May 2019*

- Planned and led activities to form cultural recognition and fundraise for social events.
- Initiated and organized a petition leading to an increase in number of STEM courses.

SKILLS

Technical: Amira, Arduino, AutoCAD, C++, IBM SPSS, LaTEX, MATLAB, Python, Reconstruction.
Wet Lab: Gel-electrophoresis, Mass-spectrometry, Micropipetting, RT-PCR, tensile testing.
Languages: Spanish (Native), English (Fluent), Mandarin (Fluent), Catalan (Fluent), Portuguese (Elementary).

ZIYING ZHANG

zhangzy5@bu.edu 646-200-1882 Boston, MA

EDUCATION

Boston University | Boston, MA Expected May 2023
B.S. in Biomedical Engineering
- GPA 3.61
- Dean's list (four semesters)
- Tri-Alpha Honor Society

Related coursework:
Probability, Statistics, and Data Science *Programming for Engineers* *Molecular Cell Biology and Biotechnology*

Reading Memorial High School | Reading, MA June 2019
- National Honor Society

PUBLICATIONS

LEADERSHIP & ACTIVITIES

Massachusetts General Hospital | Boston, MA Oct 2020 - present
Volunteer
- Escorted patients on wheelchair and provided friendly companionship to patients in need. Trained new volunteers.

Boston University After School| Boston, MA Aug 2020 - present
Member

Boston University Medlife | Boston, MA Aug 2020 - present
Member

A World of Difference at Reading Memorial High School | Reading, MA Sep 2017 - Jun 2019
Peer leader
- Ran weekly meetings with other peer leaders to inform 30 member club about upcoming events.
- Organized events to promote an inclusive community for all.

ADDITIONAL EXPERIENCE

Massachusetts General Hospital | Boston, MA May 2021 - present
Research Intern
- Conducted cancer genomics research on osteosarcoma. Performed analysis using R, reviewed relevant scientific literatures and presented results to team.
- Worked 40 hours per week during summer and 5 hours per week during school year.

CVS Pharmacy | Reading, MA June - Dec 2019
Pharmacy technician
- Assembled prescriptions under pharmacist supervision, provide patients with customer services.
- Worked 28 hours per week.

Dunkin' Donuts | Reading, MA May 2017 - May 2018
Crew member
- Delivered friendly customer services, prepare and serve products in a clean and organized environment; praised for efficiency and great attitude by supervisor.
- Worked 30 hours per week during summer and 8 hours per week during school year.

SKILLS

Language: Chinese mandarin (native), English (fluent), French (intermediate)
Computer: MS Office (Word, Excel, PowerPoint) or Google (Docs, Sheets and Slides)
Programming: R, Matlab, C

ZEWEN ZHAO

Boston, MA 02134 | (857) 763-8710 | zhao0622@bu.edu

TOEFL: 105 | GRE: 323 (159+164+3.5)

EDUCATION

Expected May 2023

Boston University, Boston, MA

Bachelor of Biomedical Engineering, GPA: 3.22

RELEVANT COURSES:

- Principles of Molecular Cell Biology and Biotechnology
- Systems Physiology
- Biomedical Measurements
- Introduction to Programming for Engineers
- Thermodynamics and Statistical Mechanics
- Probability, Statistics, & Data Science for Engineers
- Introduction to Machine Learning
- Evolution Biology
- The Business of Technology Innovation
- Clinical Applications of Biomedical Design

ACADEMIC PROJECTS:

- Preliminary Design of a Pulse Oximeter
- Analysis of Influenza Hemagglutinin
- Truss Design Project
- Research on Solving Vertigo Syndrome with 3D Soundwave Levitation
- SpectraMax i3x Plate Reader Review
- Decreasing Occurrence of Breast Implant Associated - Anaplastic Large Cell Lymphoma (BIA-ALCL)

HONORS & AWARDS

- Member of the Cum Laude society receive at Senior year of high school.
- Biology scholarship award from University of Rochester.

Brian Y. Zhou

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EDUCATION

Boston University College of Engineering — **Boston, MA**
Bachelor of Science in Biomedical Engineering — May 2023

AWARDS

Undergraduate Research Opportunities Program (UROP) Funding Recipient — Summer 2020 - Present
Kenneth Lutchen Distinguished Summer Research Fellow — Summer 2021
Provost's Scholar Award — Spring 2021
College of Engineering Dean's List — Fall 2019 - Fall 2022
National Merit Boston University Scholarship — Sept 2019 - May 2023
Yawkey Nonprofit Internship Scholarship — Summer 2020
Stanford Institutes of Medicine Summer Research Program — Summer 2018

WORK EXPERIENCE

Deloitte GPS Business Technology Solutions Analyst — Summer 2023

Pfizer Research and Development Intern — Summer 2022
- Cultured human white blood cells and measured cytokine production using MesoScale Discovery biomarker assays
- Planned and wrote multi-step protocols for novel experimental methodologies using cell culture and assays

Undergraduate Researcher in Sgro Lab — Jan 2020 – Present
- Exploring secondary messenger protein c-di-GMP and its role in inhibition of flagellum function
- Analyzing gene expression of bacteria forming multicellular matrices by sequencing plasmids and DNA

Systems Physiology Lab Learning Assistant — Sept 2022 – Jan 2023
- Managing and led lab sections of over 400 students taking Physiology courses at Boston University
- Planning and implemented weekly and semester-long projects

Undergraduate Researcher in MGH Foot and Ankle Research and Innovation Lab (FARIL) — July 2021 – Aug 2022
- Conducted systemic reviews of studies of subtalar dislocations in the ankle
- Ran statistical tests like ANOVA, Tukey's Post-hoc, and correlations on large metadata sets using Python

Born Global Sustainability Innovation Intern — Summer 2020
- Developed a sustainable, economic energy model for a biomass power plant in Maine
- Tracked promising CO_2 to protein technologies and companies

Luma Therapeutics Summer Data Consultant — Summer 2019
- Mapped and organized around 1500 psoriasis plaque scores of over 50 patients from 3 rounds of clinical trials using Excel
- Devised a numeric, encoded naming system for 1200 pictures of psoriasis plaques of clinical trial patients
- Created 300 scatter-plots showing curves of distributions of psoriasis plaque scores

PROJECTS

Development of a Burst Pressure/Leak Testing System for Surgical Adhesives, *Draper* — Sept 2022 – Present
- Improved existing CAD model of system by adjusting dimensions, surface roughness, and inserting drainage systems
- Established a visual output of pressure vs. time through code and implemented data filtering for specific burst pressure values
- Optimized system through rigorous testing of 4 leading bioadhesives and comparing experimental data to literature values

Modeling System for Non-genetic Inheritance Demonstrates Modulation of Memory, *Sgro Lab* — Jan 2021 – Present
- Wrote and coded model in Python measuring production and degradation of signaling molecule over several generations
- Discovered binomial partitioning and presence of degradation enzyme modulates non-genetic inheritance of memory in cells

Synergy of Ligands on Production of Pro-Inflammatory Cytokines, *Pfizer* — Summer 2022
- Treated Human CD4+ T-cell culture with selected ligands meant to stimulate cytokine production
- Measured cytokine production through biomarker assays using the MesoScale Discovery system
- Analyzed data for synergy of pro-inflammatory cytokine production from specific ligands

LEADERSHIP & VOLUNTEER EXPERIENCE

Vice President, *BU Biomedical Engineering Society (BMES)* — Aug 2022 - Present
Awareness Committee Chair, *BU Campus Safety Advisory Group (CSAG)* — Jan 2021 - Present
MGH Volunteer, *Patient Transport Services* — Jan 2022 - Present
Fundraising Chair, *Theta Tau Psi Delta Chapter* — Sept 2019 – Present
Social Justice Chair, *BU Asian Student Union* — Sept 2020 – Dec 2021
Volunteer, *Heart and Vascular Institute of Wisconsin* — Summer 2020

SKILLS & RELEVANT COURSEWORK

- **Skills:** MSD, qPCR, Genetic Transformations, Cell Culture, Microscopy, Python, Matlab, C, Java, Statistics and Data Analysis
- **Relevant Coursework:** Deep Learning, Biochemistry, Programming, Engineering Design, Mechanics, Circuits, Statistics
- **Languages:** English, Spanish, Mandarin

Bo Zhou

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Education

Boston University (Boston, MA) **Expected May 2023**

- Bachelor of Science in Biomedical Engineering (cumulative GPA: 3.66)
- Minor in Chemistry, concentration in Nanotechnology

Technische Universität Dresden (Dresden, Germany) **Spring 2020**

- Boston University ENG study abroad program

Relevant Coursework: Matlab, probability and statistics, machine learning, molecular bioengineering, organic chemistry, biochemistry, systems physiology, electric circuits, signals and controls, transport phenomena, optical microscopy, thermodynamics, introduction to nanotechnology, and intro to biomaterials

Bishop Hendricken High School (Warwick, RI) **2016 – 2018**

Personal Skills

Software: Matlab, ImageJ, Arduino, MastRenova, Pymol, ChemDraw, Microsoft Office Series

Analytical skills: Adherent Cell Culture, spectroscopic analysis, organic-related chemical analysis (TLC, NMR, IR, LC/MS), Biochemistry lab techniques (DNA and protein gel electrophoresis, DNA preparation, protein activity assays, SDS-PAGE, UV/Vis spectrophotometer, western blot, and etc.)

Machine Learning: NN classifier, NCC, LDA, Linear Mapping, PCA, LLSR, Logistic Regression, Binary SVM, Kernel

Language: Mandarin (mother tongue), English (6 year taught in the US), Japanese (two years)

Experience

Intern, Research Institute **January – August 2021**

Institute of Science Translational Medicine, Shenzhen Second People's Hospital

- Led research on relevant information on recent developments of Tyrosine Kinase Inhibitors by May. 2021, drafted and published review on hepatocarcinoma
- Conducted control-experiment of H_2O_2-stimulated HUVEC cells in investigation of cell senescence
- Directed data analysis on Single-cell RNA sequencing data of Hepatocellular Carcinoma, and identified metastasis-related and Tyrosine-Kinase-related genes

Projects

Senior Project **September 2022 – May 2023**

Fluidic Device for Processing Sub-millimeter Tissue Samples for Electron Microscopy

Department of Pathology and Laboratory Medicine, Boston University School of Medicine

- Designed a device to facilitate processing steps from deparaffinization to embedding of sub-millimeter tissue samples for Electron Microscopy (EM) or Immuno-EM
- Executed experiments with team to ensure the feasibility of device with another teammate

Publications

Mou L, Tian X, Zhou B (Co-first authors), Zhan Y, Chen J, Lu Y, Deng J, Deng Y, Wu Z, Li Q, et al. Improving Outcomes of Tyrosine Kinase Inhibitors in Hepatocellular Carcinoma: New Data and Ongoing Trials. *Front Onco l* (2021) 11:4183. doi:10.3389/fonc.2021.752725

Honors & Awards

Earned Dean's List (3 semesters)

Activities

Volunteer at Peru, volunteer

- Built a pond for local family **and** visited orphanages

Boston University Chinese Traditional Clothing Club (CTCC), member

- Promote Chinese culture to international groups

Jarod Zizza

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EDUCATION

Boston University | Boston, MA — Expected May 2023
B.S. in Biomedical Engineering

PROJECTS

Senior Design Project — Fall 2023
- Created a proposal detailing my team's goals, preliminary research, and approach.
- In the process of developing code for a multiomics tool to integrate, analyze, and visualize data.

Truss Design, Solid Biomechanics — Spring 2022
- Designed efficient truss and accurately predicted failure point using code.
- Constructed basic model of the designed truss to test predictions.

ACME Dental Inc., Material Science — Spring 2022
- Researched and presented material science solutions for potential dental implant issues.

Physiology Lab, Systems Physiology — Fall 2021
- Designed and performed experiment on music's effect on grip strength.
- Collected and analyzed data from test subjects to determine significance.

ACTIVITIES

Boston University Biomedical Engineering Society | Boston, MA — Sep 2022 – May 2023
Member/Mentor
- Guide underclass students with making choices for their classes and path to graduation.
- Attend meetings with other biomedical engineering students to discuss career possibilities and topics related to biomedical engineering.

ADDITIONAL EXPERIENCE

International Hall of Fame | Newport, RI — Jun 2022 – Aug 2022
TeamFAME Tennis Coach
- Instructed underprivileged middle schoolers on technique and mindsets in group setting as well as one on one.
- Inspired students to challenge themselves by being a role model and using patience, creativity, and positivity.
- Created and organized enjoyable enrichment activities outside of sports to further students' development by coordinating with other coaches and understanding the interests of the students.

Roch's Fresh Foods | Narragansett, RI — Oct 2020 – Sep 2021
Deli
- Developed strong communication and interpersonal skills servicing customers.
- Worked under pressure in high-pace environment while multitasking and prioritizing.
- Collaborated as a team with coworkers to ensure quality, food safety, and efficiency.

SKILLS

Computer: MATLAB, MS Office (Word, Excel, PowerPoint), CAD design, R Project, several Adobe products, data analysis (statistics and measurements courses)
Lab: Laboratory and workshop safety training and skills: accurate measurements, microscopy, soldering/circuitry, using oscilloscope and generator, other skills involving design and construction

Boston University College of Engineering
Department of Biomedical Engineering