Rafik B. Hariri Institute for Computing
and Computational Science & Engineering

FY24 Annual Report

HARIRI INSTITUTE
FOR COMPUTING

CONTENTS

LETTER FROM THE DIRECTOR

Dear Colleagues and Friends,

The Rafik B. Hariri Institute for Computing and Computational Science & Engineering at Boston University was founded over 10 years ago to initiate, catalyze, and propel collaborative interdisciplinary research for the betterment of society through the use of computational and data-driven approaches. Since then, the Institute has established itself as a leading multidisciplinary research institute, driving discoveries and groundbreaking innovations with transformative impact locally, nationally, and globally.

Today, the Institute comprises over 10 affiliated centers and initiatives, and a diverse research community that includes 400+ faculty research affiliates and their graduate students and postdoctoral advisees, as well as undergraduate students engaged in research from 66 departments across 13 schools and colleges. Through high-impact collaborative research, our community of thought leaders, problem solvers, scholars, and pioneers are addressing important societal problems that cannot be addressed in silos built around individual disciplines.

From creating long-memory vaccines to bolster immunity, and novel AI methods that broaden access to Alzheimer's disease detection and prognosis, to making cyber-physical systems safer, and assessing climate change's impact on human health, to bolstering the country's biopreparedness and helping close gender and racial wage disparities, and to advancing the science of autonomous systems and reducing AI's carbon footprint through cloud computing and data center innovations, our faculty and researchers are advancing groundbreaking multidisciplinary research to address many of society's most pressing challenges.

Internationally recognized for seminal contributions in their fields, our faculty received numerous awards this year. Notably, Lucy Hutyra (CAS, Earth & Environment) received a 2023 "MacArthur Genius" award for her extraordinarily original work investigating the impacts of urbanization on environmental carbon cycle dynamic; Vivek Goyal (ENG) was named a 2024 Guggenheim Fellow for his trailblazing work in computational imaging; Rhoda Au (Chobanian & Avedisian SOM) was presented with the 2023 Melvin R. Goodes Prize for Excellence in Alzheimer's Drug Development by the Alzheimer's Drug Discovery Foundation; Elaine Nsoesie (SPH) was named a Change Agent for Cultivating Inclusive AI by Mozilla; and Marshall Van Alstyne (Questrom) was named one of Thinker50's Most Influential Management Thinkers in the World. Three faculty were also elected into peer-reviewed fellowships: Daniel Segrè (CAS, Biology) and Siddharth Ramachandran (ENG) were named AAAS Fellows, and Cara Stepp (Sargent) was named an AIMBE Fellow. Seven junior faculty were also recognized with early career awards, including NSF CAREER awards to Ana Fiszbein (CAS, Biology), Jonathan Huggins (CAS, Mathematics & Statistics), Wenchao Li (ENG), Andrew Sabelhaus (ENG), and Rabia Yazicigil (ENG); an ACM SIGBED Early Researcher Career Award to Renato Mancuso (CAS, Computer Science); and a Blackwell-Rosenbluth Award to Jonathan Huggins (CAS, Statistics).

To advance high-impact multidisciplinary research, the Institute continued to invest in our people, programs, and partnerships.

To recognize and support the development of outstanding faculty and doctoral students, the Institute funded seven junior faculty fellowships and six graduate student fellowships spanning diverse disciplines including astronomy, biostatistics, computer science, computing and data science, engineering, economics, neurology, speech, and sociology. Through the Institute's AI and Education Initiative, four doctoral students were also awarded fellowships.

To catalyze multidisciplinary research collaborations, the Institute funded five FY25 Focused Research Programs, providing 'scaffolding' for multidisciplinary groups to coalesce in sustainable ways, with the goal of accelerating research for future funding and broader impact. Since its inception in 2021, our FRP program has demonstrated an impressive return on investment, seeding new collaborations, opening new avenues for research, and resulting in $34 in sponsored research for every $1 invested.

To promote opportunities for cross-disciplinary networking and collaboration across our network of faculty, postdoc, and student researchers, the Institute organized over 215 events, drawing over 9,000 attendees. We held four Focused Research Program events with 400+ attendees, featuring prominent industry and academic leaders discussing topics ranging from reinforcement learning, to medical diagnostics, to life on Mars.

Increasing industry partners was a focus for us this past year. One of FY24's major milestones was the grand opening and ribbon cutting of the Robotics and Autonomous Systems Teaching and Innovation Center (RASTIC), led by the Institute's Center for Information & Systems Engineering (CISE). BU's $9 million flagship center for AI and robotics partners with industry to ensure students acquire hands-on, applied skills beyond the classroom and are ready to make an immediate impact in the workplace. Supported by Massachusetts Technology Collaborative (MassTech) and BU, the event hosted over 200 guests, including industry leaders, state dignitaries, and BU leadership.

Another significant industry-faculty collaborative event was the two-day 2024 MOC Alliance Workshop, convening approximately 250 researchers and users from higher education, medical research centers, government, and industry with talks centered on research, development, and operations involving AI, computing, and the open cloud. This past December, the MOC Alliance joined, as a founding member, the AI Alliance. Established by IBM and Meta in collaboration with over 50 industry, academic, research, and government organizations globally, the AI Alliance's mission is to accelerate responsible open-source innovation in AI while ensuring scientific rigor, trust, safety, security, diversity, and economic competitiveness.

This year, we also established an Industry Advisory Board. The board has worked with us to identify opportunities for collaboration, provide internship and employment opportunities for our students, and guide initiation of research engagements with faculty and their research teams.

Responding to the exciting opportunities and challenges of generative AI in education and research, the Institute took a leadership role in an AI Task Force convened by the Provost. The AI Task Force is a multidisciplinary team of faculty from across the University that developed recommendations and resources on how generative AI can be "critically embraced" in education and research, as well as policies and best practices regarding the responsible use of AI by students and faculty to help prevent its misuse and mitigate any negative impact.

The investments that the Hariri Institute has made over the past year have furthered its growth and success. In FY24, we welcomed 40 new faculty affiliates and our community published 3200+ peer reviewed publications. Over 40 faculty and student researchers received honorific awards, and four were recognized among the world's most influential researchers in Clarivate's 2023 list of highly cited researchers.

Looking ahead, we aim to continue pushing the boundaries of multidisciplinary research at the intersection of computing, AI, and data science research, deepening our collaborations, and expanding our impact.

In closing, I want to express my deep appreciation for the dedication and hard work of our research affiliates, staff and partners. The success of the Hariri Institute is a testament to the commitment of our community to advance our common goals toward advancing science and research to better society.

Ioannis (Yannis) Paschalidis

Director, Rafik B. Hariri Institute for Computing and Computational Science & Engineering

Distinguished Professor of Engineering, Department of Electrical and Computer Engineering, Division of Systems Engineering, and Department of Biomedical Engineering

Founding Professor, Faculty of Computing & Data Sciences

MISSION STATEMENT

Our Mission: Catalyze cross-disciplinary collaborations among researchers, enabling them to address important problems, make ground-breaking advances, build self-sustained research programs, and have lasting societal impact.

The Hariri Institute is a federation of 10 centers and initiatives spanning artificial intelligence (AI), computational science and engineering, computer systems and cloud computing, information and cyber security, and digital health.

Our community of research scientists and engineers from academia, industry, national laboratories, hospitals, and other sectors is making fundamental methodological contributions and driving scientific progress and innovation to solve complex problems in healthcare, cyber security, robotics and autonomous systems, energy systems, cloud computing, quantum computing, and more. To advance our goal, the Institute invests in people, programs, and partnerships, supporting our research community with direct funding, opportunities for collaboration, state-of-the-art facilities, pre- and post-award grant administration, marketing and event support, as well as other administrative services.

HARIRI INSTITUTE

CONVERGE

COMPUTE

TRANSFORM

HARIRI INSTITUTE AT A GLANCE

400+
Faculty Affiliates

66
Departments

13
Schools

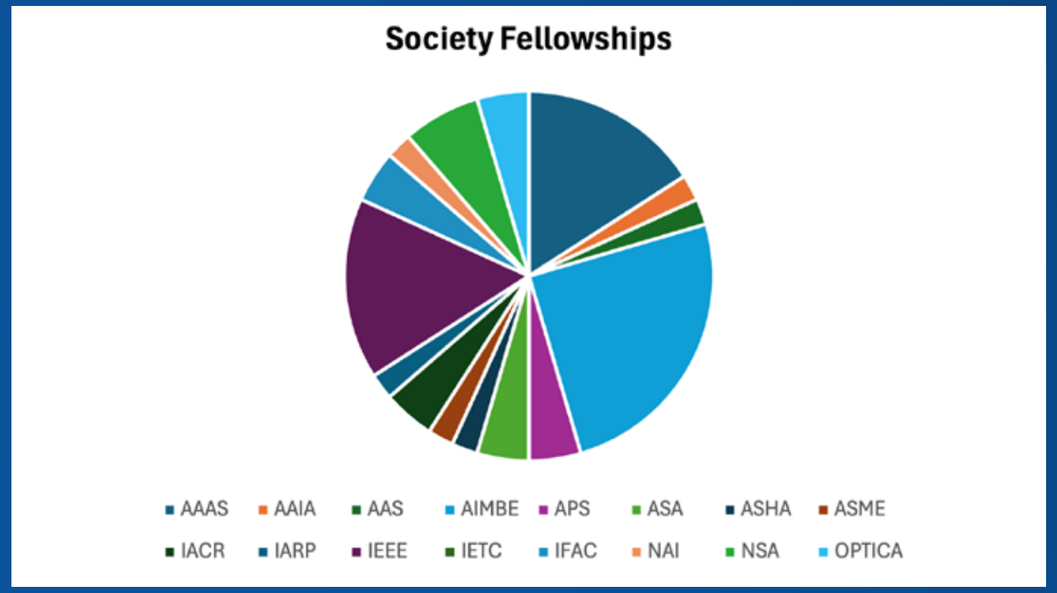
3,200+
FY24 Publications

300
Student Employees

13
Distinguished Professors

44+
Society Fellowships

4
Clarivate 2023 World's Influential Researchers



AWARDS AND ACHIEVEMENTS

43 NEW AWARDS

$21 MILLION AWARDED

110 NEW PROPOSALS

$105+ MILLION

$24 MILLION

FY24 Hariri-Led Expenditure

$47 MILLION

FY24 Hariri-Led and Catalyzed Expenditure

Programs Funded (Hariri Institute Investments)

$527,112

Awarded to BU Faculty and Graduate Students

$80,000

Awarded to Junior Faculty Fellows

$417,112

Awarded Across Four Focused Research Programs

$30,000

Awarded to Graduate Student Fellows

Grant Highlights

"Accelerating the Expansion of the New England Research Cloud (NERC)." Massachusetts Technology Collaborative. $1.34 Million. Led by Orran Krieger (ENG), Director, MOC Alliance, Co-director Red Hat Collaboratory

"A Randomized Controlled Trial to Access the Efficacy of the Numbershire Level K Gaming Intervention for Improving Math Outcomes for Students with or at Risk of Mathematics Learning Disabilities." US Department of Education. $703K. Led by Nancy Nelson (Wheelock)

"CPS: Medium: Federated Learning for Predicting Electricity Consumption with Mixed Global/Local." National Science Foundation (NSF). $1.2 Million. Led by Alexander Olshevsky (ENG), FY24 FRP Leader

FY24 HIGHLIGHTS

Red Hat Collaboratory - Awards & Success

The Red Hat Collaboratory is a partnership between Red Hat and Boston University aimed at advancing the state-of-the-art in cloud computing, AI and machine learning, and operating systems. This year, the Red Hat Collaboratory awarded 12 incubation awards to BU-Red Hat collaborative projects totaling nearly $2 million, with machine learning, energy efficiency, and secure data sharing as major research themes. Additionally, 11 undergraduates received funding for open-source research projects totaling $122,000. Notably, seven new NSF awards totaling $1.8 Million were awarded to projects funded by Red Hat Collaboratory Research Awards, and two projects received industry awards for research excellence.

New England Research Cloud (NERC)—Expansion & Funding

The New England Research Cloud (NERC) became available to general research and education users this year. NERC also installed 64 NVIDIA A100 GPUs in its data center to amp up real-time parallel processing and analysis of huge datasets and received significant funds to advance its mission to be a regional resource with world-class cloud computing services. The Massachusetts Technology Collaborative (MassTech), building on its $875,000 pilot endowment, provided an additional $1.3 million to accelerate expansion of NERC capabilities. Additionally, Red Hat Collaboratory funded the Software & Application Innovation Lab (SAIL) with $330,000 to enable the software development and integration required to support new NERC projects.

Mass Open Cloud (MOC) Alliance—Collaboration & Outreach

In December, the MOC Alliance became a founding member of the AI Alliance, launched by IBM and Meta. Composed of an international community of leading technology developers, researchers, and adopters, the AI alliance aims to foster an open community to advance open, safe, responsible AI. The MOC Alliance also hosted a two-day workshop in March, convening over 250 in-person attendees and hundreds of virtual attendees from academia, industry, healthcare, and government. Featuring 35 speakers, session topics spanned AI and the AI Alliance, the Marriage of Data and Compute, the Open Cloud and Governance and Partnerships, Education, Support for System Research, and User Outreach Facilitation.

FY24 HIGHLIGHTS

AI and Education Initiative—Inaugural Funding Programs Launched

The AI and Education Initiative launched two new competitive funding opportunities this year to advance innovative research at the intersection of AI and education. The AI and Education Faculty Research Grants Program was launched to support faculty-driven research, accelerating future funding and broader impact; the program awarded $60,000 to four projects. The Initiative also launched the inaugural AI and Education Initiative Graduate Student Fellows Program; $20,000 was awarded to four doctoral students to support their research focus in this critical area.

BU Hariri Institute for Computing
AI and Education Initiative

RASTIC—Launched with Grand Opening

The Robotics and Autonomous Systems Teaching and Innovation Center (RASTIC) held a grand opening in March. With a $9M capital investment from Mass Tech and BU, and ongoing support from robotics industry partners, RASTIC brings together academia and industry to develop the next-generation competitive robotics and autonomous systems workforce. Located on BU's Charles River campus, the 2,000 ft2 facility provides a neutral space for companies to engage directly with faculty and students to design, prototype, and test new robotic innovations. The grand opening included talks from state, industry and university leadership; facility tours; and 16 student demonstrations of robotic projects spanning smart cities, medical robotics, drones, autonomous driving, smart home applications, and more.

BU AI Task Force—Formed and Findings Reported

In September, the BU Provost formed a multidisciplinary BU team of faculty and staff and charged them with examining the impact of generative AI (Gen AI) tools on education and research, and reviewing existing policies adopted by BU schools, colleges, and other academic institutions. Led by Hariri Institute faculty, the task force met throughout the fall and spring, consulted with AI experts, and published its "Report on Generative AI in Education and Research" in April. The data offers insights into the most effective university practices related to generative AI. Additionally, it makes use of natural language processing to foster a deeper understanding of the applications and ethical considerations surrounding this transformative technology.

BU AI Research & Teaching Taskforce

HARIRI INSTITUTE FOCUSED RESEARCH PROGRAM

The mission of the Hariri Institute's Focused Research Programs (FRPs) is to evolve and advance Boston University's research in computing and data science around areas of strategic importance and emerging opportunity. The programs are designed to facilitate research convergence by providing 'scaffolding' for groups to coalesce in sustainable ways, with the goal of accelerating research for future funding and broader impact.

$975K
FRP Investment

$32.9M
Sponsored Research

$34 for every **$1**
In Sponsored Research for every $1 In FRP Investment

3,400%
Return on Investment

794 FRP PUBLICATIONS

FY21–FY23 FRPs

Continuous Analysis of Mobile Health Data among Medically Vulnerable Populations
Data and Misinformation in an Era of Sustainability and Climate Change Crises
Leveraging AI to Examine Disparities and Bias in Health Care
Machine Learning for Chemistry and Materials Science
Quantum Convergence
Simulation Modeling for Population Health
Teaching Machines Human-Like Intelligence

HARIRI INSTITUTE FOCUSED RESEARCH PROGRAMS

FY24 Focused Research Programs

The Novel Data Science and AI approaches for Brain Health and Brain Disease FRP

The Novel Data Science and AI approaches for Brain Health and Brain Disease FRP is led by Professors Swathi Kiran (Sargent), David Boas (ENG), Margrit Betke (CAS, Computer Science), and Prakash Ishwar (ENG). It aims to bring together researchers and faculty from across BU to focus on research in continuous brain monitoring, brain fingerprinting, and digital health. The FRP is cosponsored by the Hariri Institute, the School of Public Health and the Clinical & Translational Science Institute (CTSI).

In FY24, the FRP engaged in interdisciplinary, data driven research collaborations aimed at increasing understanding of brain health and improving treatment of brain disease. One project was initiated that aims to use machine learning to create personalized recovery plans for individuals with neurological disorders; preliminary study findings were published (Hantian Liu, Claire Cordella, Prakash Ishwar, Margrit Betke, Swathi Kiran, "Consistent long-term practice leads to consistent improvement: Benefits of self-managed therapy for language and cognitive deficits using a digital therapeutic," Frontiers in Digital Health, Vol 5, 2023. DOI=10.3389/fdgth.2023.1095110.) This project resulted in a web-based therapy calculator application and a number of papers are currently in preparation.

Additionally, the FRP facilitated collaboration with the Neurophotonics Center to develop noninvasive neuroimaging technology that continuously tracks human brain function and behavior in real time built on the an NIH grant titled "The Neuroscience of Everyday World" - A novel wearable system for continuous measurement of brain function. Additional collaborations with the FRP team have extended this work to participants with dementia and a grant proposal submitted to the NIH brain health initiative.

Several events were also organized. An industry panel titled "What can Digital Diagnosis and Digital Therapeutics tell us about the Brain" was held on April 25th. There, digital-health industry leaders discussed advances in commercial digital diagnoses and digital therapeutic solutions in the neurological disorder space. Speakers included Veera Anantha, CEO & Co-Founder Constant Health Therapy; David Bates, CEO & Cofounder, Linus Health; Geoffrey Gill, CEO, Verisense Health; Shaun Patel, CEO & Co-Founder, REACT Neuro; and Jennifer Lavanture, Vice President of Business Development and Corporate Strategy, MedRhythms.

April 25th, 2024: FRP industry panel on "What can Digital Diagnosis and Digital Therapeutics tell us about the Brain."

On October 18th, a student-led workshop on "Machine Learning and Brain Behavior Data" was organized and featured the work of current postdocs and graduate students specializing in machine

HARIRI INSTITUTE FOCUSED RESEARCH PROGRAMS

learning, brain health, behavior data, aphasia, neuroscience, and related fields. Swathi Kiran and David Boas also contributed significant energy into hosting the Neuroscience of the Everyday World Conference held August 26th-27th, 2024. The two-day event brought together leaders in the fields of computer science, biomedical engineering, cognitive science, neurology, and clinical neuroscience to present state-of-the-art research, all focused on the study of human brain function and continuous brain measurement in real-world activities.

Optimal Bio-Inspired Design of Holistic Rehabilitation Systems FRP

The goal of the Optimal Bio-Inspired Design of Holistic Rehabilitation Systems FRP is to develop optimal bio-inspired methods and hardware design for seamlessly integrated human-robot systems, particularly for supporting rehabilitation and individuals with physical impairments. The FRP is led by Eshed Ohn-Bar (ENG) and Alexander Olshevsky (ENG) and funded by the Hariri Institute.

FRP leaders organized the Reinforcement Learning (RL) Symposium on May 10. RL is a field in AI inspired by learning mechanisms in biological systems that has emerged as a powerful generalized paradigm for a diverse set of applications, particularly those requiring adaptive reasoning, such as large language model training (e.g., chatGPT), education and rehabilitation technologies, transportation and energy-grid optimization, robotics, and more.

Reinforcement Learning (RL) Symposium hosted on the 17th floor of the BU Center for Computing & Data Sciences.

The day-long symposium featured eight renowned speakers and sought to uncover fundamental challenges in reinforcement learning frameworks and directions toward addressing them, particularly toward closing the current gap between theory, AI model training, and real-world applications and users. Over 200 researchers from academia, healthcare and industry attended the in-person symposium.

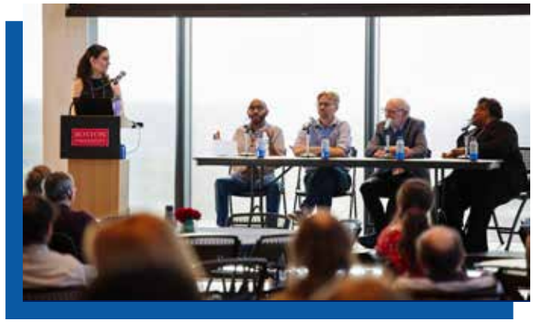
Event speakers included: Bahman Gharesifard, Professor, Electrical & Computer Engineering, University of California, Los Angeles; Amin Karbasi, Associate Professor, Electrical Engineering & Computer Science, Yale University & Staff Research Scientist at Google; Alec Koppel, AI Research Lead/VP in the Multiagent Learning and Simulation Group within Artificial Intelligence Research, JPMorganChase; Na Li, Winokur Family Professor, Electrical Engineering and Applied Mathematics, Harvard John A. Paulson School of Engineering and Applied Sciences; Antonin Raffin, Research Engineer, Robotics and Machine Learning, German Aerospace Center; Alejandro Ribeiro, Professor, Electrical and Systems Engineering, University of Pennsylvania; Daniel Russo, Associate Professor, Decisions, Risk, and Operations Division, Columbia Business School; and Kaiqing Zhang, Assistant Professor, Electrical and Computer Engineering, Institute for Systems Research, University of Maryland.

First Trip to Mars: How to Pack Light FRP

The First Trip to Mars: How to Pack Light FRP aims to support NASA's plans to safely land humans on Mars in the 2030s by producing novel software based on data from Mars orbiters and rovers. This software will model the ionosphere and its impact on navigation systems, and engineer microbial communities capable of carbon sequestration and nutrient production. The FRP is led by Marianna Felici (Center for Space Physics) and Paul Withers (CAS, Astronomy) and funded by the Hariri Institute.

On November 17, FRP leaders organized a workshop in which the interdisciplinary researchers met and presented high-level research, and strategized to build team cohesiveness. The "Space Travel with Earth Wisdom" research symposium was held on May 24. The event brought together researchers at the intersection of ecology, botany, biology, bioinformatics, data-science, and space science to look at how humans can approach space travel ethically and sustainability and use the wisdom of this planet to bring life to Mars. The symposium featured 15 invited speakers, including BU faculty and students, and industry leaders. BU faculty speakers included: Ilija Dukovski, Research Associate Professor (CDS, Bioinformatics); Marianna Felici, Research Scientist, Center for Space Physics; Yannis Paschalidis, Director, Hariri Institute for Computing, Professor (ENG, CDS); Joshua Semeter, Director of Center for Space Physics, Professor (ENG); and William Tomlinson, Director, Software & Applications Innovation Lab (SAIL). Industry speakers included: Thomas Green, Indigenous Historian; Louvere Walker-Hannon, Application Engineering Senior Team Lead, MathWorks, and Programs Chair of NSBE Boston Professionals; Phil Hattis, Laboratory Fellow, Draper; Chris Moore, Astrophysicist, Center for Astrophysics; Ann Raiho, Head of Data Science, Funga; Kenn Sebesta, Executive Director, RASTIC; and Judith Sumner, Ethnobotanist and Author. Student speakers included: Dylan Mankel, PhD Student (CAS, Biology); Brackney Pickett, Graduate Student (CAS, Astronomy); and Zoey Werbin, PhD Candidate (CAS, Biology). Over 200 faculty, students, and industry researchers attended.

The FRP researchers have also drafted four manuscripts, submitted three foundation proposals, and are developing a website to produce results. Additionally, Marianna Felici will be presenting results this December at the American Geophysical Union's annual meeting.



Space Travel with Earth Wisdom FRP Symposium held on the 17th floor of the BU Center for Computing & Data Sciences

Health Equity in the Wake of Continued Climate Change: Leveraging Big Data to Inform Action FRP

The goal of the Health Equity in the Wake of Continued Climate Change: Leveraging Big Data to Inform Action FRP is to solidify BU's early leadership on climate and health research that drives solutions and champions equity. The researchers are developing infrastructure and shared resources to foster and reinforce collaboration across BU; seed innovative new research; accelerate the pace of research and translation; and collectively position BU investigators to be even more competitive for future funding opportunities that address this pressing global challenge. This FRP is led by Gregory Wellenius (SPH) and Lucy Hutyra (CAS, Earth and Environment) and is funded by the Hariri Institute and the Institute of Global Sustainability (IGS). In FY24, FRP leaders held several planning sessions and have organized a full-day research symposium to be held in November 2024.

HARIRI INSTITUTE FY25 FOCUSED RESEARCH PROGRAM AWARDS

Multimodal Transformer Architectures for Neuropathology Study of Alzheimer's Disease

The goal of the Multimodal Transformer Architectures for Neuropathology Study of Alzheimer's Disease Focused Research Program is to improve premortem diagnosis of neuropathologic processes underlying cognitive impairment (mild cognitive impairment and dementia) utilizing a machine learning approach to definite patterns in MRI scans and neuropsychological data that predict underlying neuropathology and then understand these patterns through latent space analysis. The proposed work is highly interdisciplinary and requires expertise from five different departments across the Charles River Campus and the Medical Campus (both from the School of Medicine and the School of Public Health). This Focused Research Program is led by Xin Zhang (ENG) and Chad Farris (Chobanian & Avedisian SOM) and is co-sponsored by the Digital Health Initiative at the Hariri Institute for Computing, the School of Public Health Population Health Data Science Program, the Clinical and Translational Science Institute, and the Evans Center for Interdisciplinary Bio

From Self-Driving Labs to Community-Driven Labs

The goals of the From Self-Driving Labs (SDLs) to Community-Driven Labs Focused Research Program are to develop the digital infrastructure and basic science to transform SDLs into community-driven laboratories by establishing facile, safe, and efficient methods for external researchers to run experiments on autonomous systems. This work will convert isolated instruments into shared community resources akin to High Performance Computing that allows diverse materials researchers to address important societal challenges. This Focused Research Program is led by Keith Brown (ENG) and is sponsored by the Hariri Institute for Computing.

HARIRI INSTITUTE FY25 FOCUSED RESEARCH PROGRAM AWARDS

Enhancing Models for Breast Cancer Risk Prediction and Bias Mitigation through Clinician AI Collaboration

The Enhancing Models for Breast Cancer Risk Prediction and Bias Mitigation through Clinician-AI Collaboration Focused Research Program aims to identify the hidden sources of biological and demographic biases of AI in breast cancer risk prediction based on mammography images. Using recent progress in Large Language Models (LLMs), this framework enables clinicians to interact with the AI model at a level impossible with the current AI framework. This Focused Research Program is led by Clare Poynton (Chobanian & Avedisian SOM) and Kayhan Batmanghelich (ENG) and is co-sponsored by the Digital Health Initiative at the Hariri Institute for Computing, the School of Public Health Population Health Data Science Program, the Clinical and Translational Science Institute, and the Evans Center for Interdisciplinary Biomedical Research.

Privacy Preserving Energy Analytics for Data Centers

The goal of the Privacy Preserving Energy Analytics for Data Centers Focused Research Program is to demonstrate, for the first time, that large-scale computer systems will achieve cost reduction and energy efficiency improvements via a novel privacy-preserving, collaborative, and scalable analytics and optimization framework. The researchers aim to achieve this goal through a specific high-impact application of their privacy-preserving analytics framework: collaborative data center demand response, where data centers interact and jointly optimize for achieving better electricity cost tradeoffs and energy efficiency in the grid. This research is only possible with a convergent research team and approach, spanning expertise and solutions across energy (power systems and grid), computing design automation, optimization, privacy, computer systems, and hardware. This Focused Research Program is led by Ayse Coskun (ENG), Adam Smith (CAS, Computer Science), and Ajay Joshi (ENG) and is sponsored by the Hariri Institute for Computing, and the Center for Reliable Information Systems & Cyber Security (RISCS).

HARIRI INSTITUTE FY25 FOCUSED RESEARCH PROGRAM AWARDS

AI for Understanding Earthquakes

The goals of the AI for Understanding Earthquakes Focused Research Program are to apply AI to explore promising research directions and to build a foundation for further research in this area. Bringing together interdisciplinary AI and earth science experts from Boston University, Los Alamos National Laboratory (LANL), and Harvard University, this FRP will explore optimal deep learning architectures for seismic data, investigate use of video-surveillance infrastructure as an alternative to costly Earthquake Early Warning (EEW) systems, and employ machine learning to advance our understanding of earthquakes. This Focused Research Program is led by Brian Kulis (ENG) and is sponsored by the Hariri Institute for Computing.

2024 GRADUATE STUDENT FELLOWS

Fatih Acun, PhD student, ENG, Computer Engineering. Acun is currently researching intelligent methods for sustainable and energy-efficient high-performance computing.

Sarah Bald, PhD student, CDS, Bioinformatics. Bald's work seeks to understand how the complex metabolic functions of microbial communities are organized, determined, and distributed with applications in health benefits and climate solutions.

Taylor Beauvais, PhD student, CAS, Sociology. Beauvais leverages a background in public opinion research and data analysis to discover the impact of AI on economic, social, and governmental systems.

Xinyi Hu, PhD student, CDS, Computing & Data Sciences. Hu's research focuses on machine learning algorithms and their applications in neuroscience and image analysis, as well as machine and research modeling.

Masha Lazou, PhD student, ENG, Biomedical Engineering. Lazou is developing computational methods to enhance the understanding of protein-protein and protein-ligand interactions by concentrating on protein structural ensembles and their implications in drug discovery and development.

Ryan Senne, PhD student, Chobanian & Avedisian SOM, Neuroscience. Senne's work combines machine learning, statistical modeling, and the neuroscience of decision-making to understand how neuromodulatory systems alter local neuronal network dynamics.

Fatih Acun
Electrical and Computer Engineering, ENG

Sarah Bald
Bioinformatics, Interdisciplinary Program, CDS

Taylor Beauvais
Sociology, GRS

Xinyi Hu
Algorithmic and Statistical Modeling, Machine Learning, CDS

Masha Lazou
Biomedical Engineering, ENG

Ryan Senne
Neuroscience, GPN

2024 Graduate Student Fellows at the Hariri Institute Community Recognition Awards Ceremony on May 30, 2024.

Our Graduate Student Fellows program recognizes outstanding PhD students who are pursuing computing and data-driven research at Boston University. These fellows have a a three-year appointment.

Graduate Student Fellow Experiences

"This experience broadened my horizons as far as the scope and applications of computational and data-driven science and how this intersects with my work in speech and language sciences. This funding allowed me to travel to some of the most important conferences in my field, which broadened my professional networks and provided a platform to hone my oral presentation skills."

—Hilary Miller (Sargent, GSF 2021)

"The Hariri Institute provided a robust platform for both personal and professional growth. The recognition and resources afforded by the award also opened up numerous opportunities for professional development and academic collaborations, which have been crucial in advancing my career prospects and research capabilities."

—Chen Ling (ENG, GSF 2021)

2024 JUNIOR FACULTY FELLOWS

Dillon Brout, Assistant Professor, CAS, Astronomy. Brout currently leads several major cosmological experiments which employ machine learning, statistical, data processing, and modeling techniques to catalog the universe's dark energy, dark matter, ordinary matter, and Einstein's general relativity.

Jacob Brown, Assistant Professor, CAS, Political Science. Brown's research focuses on where people live, and how where they live influences their politics by examining new methods for measuring political geography, including the causes and consequences of political segregation in the United States.

James Chapman, Assistant Professor, ENG, Mechanical Engineering. Chapman's work includes fusion of physics-driven simulations and machine learning to discover and design new materials for energy, corrosion, and pollution mitigation technologies.

Huimin Cheng, Assistant Professor, SPH, Biostatistics. Cheng's methodological research focuses on statistical network analysis, graph deep learning, causal inference, machine learning, and Riemannian geometry.

Kimberly Crespo, Assistant Professor, Wheelock, Department of Speech, Language, & Hearing Sciences. Crespo directs the Bilingual Learning Lab, where she researches how child-environment interactions influence language acquisition using a variety of experiment methods.

Brian DePasquale, Assistant Professor, ENG, Biomedical Engineering. DePasquale conducts research in theoretical neuroscience and machine learning, where his research uses mathematical models to characterize and explain how populations of neurons perform computations to produce behavior.

Masao Fukui, Assistant Professor, CAS, Economics. Fukui is currently conducting research which focuses on the theoretical and empirical aspects of macroeconomics and international economics.

Charlene Ong, Assistant Professor, Chobanian & Avedisian SOM, Neurology. Ong's research develops and validates data-driven tools to support clinical decision making in patients with catastrophic neurologic injury including ischemic and hemorrhagic stroke, traumatic brain injury and anoxic brain injury.

Dillon Brout
Astronomy,
CAS

Jacob Brown
Political Science,
CAS

James Chapman
Mechanical Engineering,
ENG

Huimin Cheng
Biostatistics,
SPH

Kimberly Crespo
Speech, Language, &
Hearing Sciences,
SAR

Brian DePasquale
Biomedical Engineering,
ENG

Masao Fukui
Economics,
CAS

Charlene Ong
Neurology,
Chobanian and Avedesian
School of Medicine

2024 Junior Faculty Fellows at the Hariri Institute Community Recognition Awards Ceremony on May 30, 2024.

Our Junior Faculty Fellows program aims to both recognize outstanding early-career computing and data-driven researchers at Boston University and support their continued development by connecting them with one another and with the Institute community at large through various mechanisms and activities. Junior Faculty Fellows are early-career faculty researchers who are selected for a three-year appointment.

Junior Faculty Fellow Experiences

"Receiving the Hariri Institute fellowship positively impacted my experience by providing the resources needed to advance my research. The award facilitated collaborations with industry partners, enhancing the practical relevance and reach of my work."

—Garrett Johnson (Questrom, JFF 2021)

"The fellowship helped me develop a sense of community with other scholars in the Institute and across Boston University who have different backgrounds but with common interests in computations. I would highly encourage other junior faculty to seek this opportunity."

—Jihye Jeon (CAS, Economics, JFF 2021)

DATA SCIENCE MENTORSHIP CIRCLES (DSMC)

Data Science Mentorship Circles (DSMC) is a Hariri Institute program that connects BU alumni who are working in the data science field with BU graduate students from diverse fields spanning astronomy, biostatistics, computer science, data science, engineering, and math and statistics. DSMC selects mentors through a call for applicants done annually in September. Throughout the year, DSMC organizes workshops for professional development and networking, and student mentees meet with mentors monthly. In FY24, DSMC enrolled 62 student mentees from an applicant pool of 82, and 17 mentors. It organized six events drawing 185 attendees. Four workshops were held, covering topics such as the art of networking, tips and tricks for resume crafting, nailing interviews, and assessing a company's financial health. Two events were organized to connect all mentors and mentees: a speed networking event (online) and a program farewell panel discussion and networking session (in-person).

Hear from DSMC Past Participants

"I was impressed by the program format shared during the mentee info session, prompting me to apply to become a mentee. I believed they could provide me with valuable resources, but to my surprise, the experience has exceeded my expectations, providing valuable guidance in transitioning from a fresh grad to an early career professional. I've acquired techniques, networking skills, and timeless wisdom. Conversations with mentors from different industries have been enlightening. With my mentor's support, I improved my resume, interview skills, and networking, leading to a successful job offer. I'm grateful for the rapid growth and continuous support. Even after the official event ended, the support and feedback from different mentors have been a constant source of inspiration and guidance."

—Ranfei Xu, M.S. Statistical Practice, Class of 2023

"The Data Science Mentorship Circles program has been one of the most beneficial experiences I have had in graduate school. Receiving mentorship from BU (Bio)Statistics alumnus ensured that career advice and guidance was tailored precisely to my experiences and training. In this way, the interactions with my mentor consistently addressed challenges I was facing while beginning a career in Data Science. This program underscores BU's continued dedication to its students beyond the traditional classroom environment."

—Benjamin Draves, PhD Student in Statistics, Class of 2021

Photo from DSMC Event held on the 17th floor of the BU Center for Computing & Data Sciences

Hariri Institute

CENTERS AND INITIATIVES

MOC Alliance

Software & Application Innovation Lab (SAIL)

Center for Computational Science

Center for Reliable Information Systems and Cyber Security (RISCS)

AI Research Initiative (AIR)

Red Hat Collaboratory

AI and Education Initiative

Center for Information and Systems Engineering (CISE)

Boston Women's Workforce Council

Digital Health Initiative

AI AND EDUCATION INITIATIVE

The AI and Education Initiative facilitates research at the intersection of AI and learning for all people and backgrounds, and all the topics and contexts where learning happens. The Initiative transcends disciplinary boundaries, drawing on perspectives on learning spanning computing, education, design, social sciences, medicine, business, and beyond. It aims to use AI to inform human learning and teaching, take inspiration from human learning and teaching to advance AI, and build use-inspired AI technologies learners can use to transform themselves and the world. The Initiative is led by Naomi Caselli, Associate Professor of Deaf Education and Director of the Deaf Center at Wheelock College of Education & Human Development.

The AI and Education Initiative continued to thrive in the 2023-2024 academic year. Following a successful faculty search, Michael Chang was hired as an Assistant Professor in AI and Education; Chang's research focuses on enhancing personalized learning experiences through AI and examining its ethical implications in classrooms. Additionally, the Initiative welcomed Ola Ozernov-Palchik as a Research Assistant Professor to the AI and Education core faculty. Her interdisciplinary research utilizes quantitative, neuroimaging, and AI approaches to study language development and improve children's literacy outcomes. The group now includes 56 affiliated faculty from 17 departments across the university, fostering a diverse and collaborative environment.

Facilitating the professional growth of our community, the Initiative hosted multiple events, including a workshop on using ChatGPT in educational contexts, and a symposium on AI and Education featuring an international lineup of presenters. Wheelock Clinical Associate Professor Nermeen Dashoush shared her work developing Lyla in the Loop, a new PBS show to promote AI literacy in early childhood. Presenters also shared open science practices to spur innovation in AI and Education, such as how Boston Public Schools are adapting to AI, and how teachers might implement AI in the classroom. Wheelock faculty Ashley Moore and Andrea Bien led a workshop on academic integrity and the use of generative AI.

To support innovative research, the Initiative funded four faculty research grants for a total of $80,000, and four doctoral fellowships for a total of $20,000. These awards will further research on diverse topics, including technologies to support math instruction, enhancing language comprehension and second language proficiency, and improving reinforcement learning models and student exercise outcome predictions.

The impact of the AI and Education Initiative this year has been remarkable. Core and affiliated faculty published 76 groundbreaking scholarly articles and secured more than $6,000,000 in grant funding. Strategic collaborations were forged with key partners including school districts in the greater Boston Area. Reflecting on BU's commitment to the critical embrace of AI, the Initiative has begun drafting a proposal for a new degree in AI and Learning, aiming to formalize and expand BU's academic offerings in this innovative field. These accomplishments highlight the Initiative's dedication to advancing research, enhancing educational practices, and building a robust network of partnerships that drive innovation and excellence in the field of AI and education.

Selected Grant Highlights

Naomi Caselli was awarded a subcontract (BU $605,529) from the National Institute on Disability, Independent Living, and Rehabilitation Research to develop metrics to evaluate automatic sign language translation technology. She was also awarded a NIH R01 subcontract (BU $1,175,080) on a project documenting language acquisition in every deaf and hard of hearing child in the state of California. Machine learning techniques will be used to identify patterns in language experiences that lead to successful outcomes. She also won an NIH supplement to a project entitled "Effects of input quality on ASL vocabulary acquisition in deaf children" designed to increase mentorship capacity and data science education for deaf scholars through NIH NIDCD ($360,594).

Ola Ozernov-Palchik led a collaborative project with colleagues at MIT, securing an $80,000 grant aimed at closing equity gaps in vocabulary knowledge using AI. The project will develop and evaluate a speech-based, LLM-empowered conversational tutor to enhance vocabulary knowledge in 3rd grade children from diverse socio-demographic backgrounds. Additionally, as a co-PI, she received a $75,000 Red Hat Collaboratory grant to develop an open-source, AI-integrated data repository for educational data.

Selected Publication Highlights

Xu, Paiheng, Liu Jing, Jones, Nathan, Cohen, Julie & Ai, Wei. (2024). The Promises and Pitfalls of Using Language Models to Measure Instruction Quality in Education. Proceedings of the 2024 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies. (Vol 1: Long Papers) 4375-4389. DOI:10.18653/v1/2024.naacl-long.246.

Yu, H., Allessio, D. A., Lee, W., Rebelsky, W., Sylvia, F., Murray, T., ... & Betke, M. (2023, October). COVES: A Cognitive-Affective Deep Model that Personalizes Math Problem Difficulty in Real Time and Improves Student Engagement with an Online Tutor. In Proceedings of the 31st ACM International Conference on Multimedia (pp. 6152-6160). DOI:10.1145/3581783.3613965.

Cui, C., Abdalla, A., Wijaya, D., Solberg, S., Bargal, S.A. (2024). Large Language Models for Career Readiness Prediction. In: Olney, A.M., Chounta, IA., Liu, Z., Santos, O.C., Bittencourt, I.I. (eds) Artificial Intelligence in Education. Proceedings of the 25th International Conference on Artificial Intelligence in Education (AIED 2024). Communications in Computer and Information Science, vol 2150. Springer, Cham. doi.org/10.1007/978-3-031-64315-6_26.

Kim, K., Chen, X., & Liu, X. Automating spoken data analysis with commercial NLP support: A tutorial of accuracy scoring of elicited imitation. Research Methods in Applied Linguistics. Vol 3, Issue 3. 2024, doi.org/10.1016/j.rmal.2024.10012

2024 AI and Education Initiative Faculty Research Grant Awards

"BLAST (Benefits and Limitations of AI in Supporting Teachers of Mathematics)" PI: Leslie Dietiker, Associate Dean for Research (Wheelock)

"First Language-Second Language Proficiency with MultiAutoEIT: An Open Access Measure of Oral Language Proficiency" PI: Kathy MinHye Kim (Wheelock)

"Giving the Gift of Time: An AI Trained Curriculum Coach for K-12 Teachers" PI: TJ McKenna (Wheelock)

"Triangulating Translation: An Inquiry into the Use of Generative AI to Bridge Language and Comprehension" PI: Zachary Rossetti (Wheelock)

2024 AI and Education Initiative Doctoral Fellowship Awards

Erin Barno, PhD candidate (Wheelock)

Erning (Henry) Chen, PhD candidate (Wheelock)

Zhongkai Shangguan, PhD candidate (ENG)

Hao Yu, PhD candidate, (CAS, Computer Science)

AI and Education Initiative Doctoral Fellowship Award recipients at the Hariri Community Recognition Awards Ceremony

ARTIFICIAL INTELLIGENCE RESEARCH INITIATIVE (AIR)

The Artificial Intelligence Research (AIR) Initiative brings together researchers from diverse disciplines to advance research in machine intelligence. Their work aims to create intelligent systems that reliably make decisions, reason about data, and communicate with humans. The Initiative is co-led by Computer Science Professors Margrit Betke and Kate Saenko. AIR Core Faculty members include Computer Science Professors Iddo Drori, Bryan Plummer, Stan Sclaroff, and Derry Wijaya, and Engineering Professors Brian Kulis, and Venkatesh Saligrama. AIR researchers include 12 affiliated faculty from various disciplines, including biomedical engineering, computer science, electrical and computer engineering, computing and data sciences, linguistics, mathematics and statistics, management, and physics.

This year, AIR faculty were recognized for their groundbreaking work. AIR faculty received five new grants (from NSF, NIGMS, Sandia National Laboratories, and Hariri Institute), and won two awards (a Best Poster Award from 2023 IEEE International Joint Conference on Biometrics (IJCB), and a Best Paper Runner Up Award at 2023 AI for Content Creation Workshop, IEEE Computer Vision and Pattern Recognition Conference.)

AIR faculty collaborated across BU Charles River and Medical campuses to advance AI research in healthcare and medicine, resulting in numerous papers. Margrit Betke with AIR faculty affiliates Prakash Ishwar (ENG) and Janusz Konrad (ENG) collaborated with Swathi Kiran (Sargent) and Archana Venkataraman (ENG) to develop AI models that predict a patient's responsiveness to aphasia rehabilitation. Supported by a Hariri Institute internal grant, their work resulted in two NIH proposal submissions and several publications. Additionally, with Christopher Gill (SPH) and BMC clinicians Bindu Setty and Ilse Castro-Aragon, AIR faculty presented a pediatric lung US dataset in the influential journal Radiology: Artificial Intelligence, "Curated and Annotated Dataset of Lung US Images in Zambian Children with Clinical Pneumonia" https://doi.org/10.1148/ryai.230147). A collaboration between Margrit Betke and Vijaya Kolachalama (Chobanian & Avedisian SOM) also yielded several publications for AI solutions in digital pathology.

The AI and Emerging Media (AIEM) team, co-led by Margrit Betke and Derry Wijaya, published papers related to AI and communication scholarship, including "The Affective Nature of AI-Generated News Images: Impact on Visual Journalism," in 2023 11th International Conference on Affective Computing and Intelligent Interaction (ACII), doi: 10.1109/ACII59096.2023.10388166; and "Enhancing Emotion Prediction in News Headlines: Insights from ChatGPT and Seq2Seq Models for Free-Text Generation," Proceedings of the 2024 Joint International Conference on Computational Linguistics, Language Resources and Evaluation (LREC-COLING 2024), pages 5944–5955.

AIR remains active in statistical machine learning. Mark Kon and collaborators published a solution for data imputation in large medical datasets: W. Li, et al.,"Multilevel Stochastic Optimization for Imputation in Massive Medical Data Records," in IEEE Transactions on Big Data, vol. 10, no. 02, pp. 122-131, 2024. doi: 10.1109/TBDATA.2023.3328433.

This year, six AIR students defended their PhD theses, including: Dina Bashkirova, "Domain Invariance for Semantically Consistent Image Manipulation," advised by Kate Saenko; Andrea Burns, "Learning and Evaluating Multimodal Representations for Digital Domains," co-advised by Kate Saenko and Bryan Plummer; Vitali Petsiuk, "Neural Network Interpretations as Means for Model Analysis and Improvement," advised by Kate Saenko; Ximeng Sun, "Efficient Deep Learning for Image and Video Understanding," advised by Kate Saenko; Reuben Tan, "Grounding Language in Image, Video, and Audio Modalities," co-advised by Kate Saenko and Bryan Plummer; and Yi Zheng, "Context-aware Digital Pathology: Enhancing Whole Slide Image Analysis through Global-Local Feature Learning," co-advised by Margrit Betke and Vijaya Kolachalama.

Professional services included leadership roles for the influential NeurIPS 2023: Kate Saenko served as program co-chair, Bryan Plummer as area chair, and Brian Kulis as co-organizer of the "ML for Audio" workshop. Bryan Plummer was also area chair for several computer vision and machine learning conferences, including CVPR'23 and ACL'23.

Kate Saenko and Bryan Plummer, as program co-directors, also led outreach efforts in the AI4All summer program, promoting greater diversity and inclusion in the field of AI. Margrit Betke served as a panelist on "Experiences as a Woman in STEM," which was organized by the Women in Science and Engineering for Warren Towers, a student group at Boston University. She also gave an invited lecture at the Weston High School on "Artificial Intelligence for Healthcare, Conservation, and News Analysis."

AIR research seminars and talks were held throughout the year and attended by over 2,100+ faculty, students, staff and guests. Seven Distinguished Speaker events were held, featuring speakers renowned around the world for their contributions to the field of AI. Weekly AIR meetings and "coffee hours" with faculty and students were also held, providing opportunities for research presentations and the sharing of ideas.

AIR Faculty Selected Grant Highlights

Collaborative Research: "NeTS: Medium: Large Scale Analysis of Configurations and Management Practices in the Domain Name System." NSF. $525,000. PI: Mark Crovella (CAS, CS)

"ATD - Anomaly detection and functional data analysis with applications to threat detection for multimodal satellite data," NSF DMS. $250,000. PI: Julio Castrillon (CAS, Mathematics & Statistics). Co-PI: Mark Kon (CAS, Mathematics & Statistics).

"Multilevel stochastic orthogonal subspace transformations for robust machine learning with applications to biomedical data and Alzheimer's disease subtyping," NSFDMS/NIGMS. $600,000. PI: Julio Castrillon. Co-PI: Mark Kon.

Adobe Systems. $20,000 gift to Bryan Plummer.

Awards

2023 IEEE International Joint Conference on Biometrics (IJCB) Best Poster Award: "Age-constrained Ear Recognition: The EICZA Dataset and SASE Baseline Model." (Margrit Betke with CS PhD student Wenda Qin and collaborators)

2023 AI for Content Creation Workshop, IEEE Computer Vision and Pattern Recognition Conference Best Paper Runner Up: "Text-to-image Editing by Image Information Removal." (Bryan Plummer with CS PhD student Zhongping Zhang and collaborators)

BOSTON WOMEN'S WORKFORCE COUNCIL (BWWC)

BWWC is a public-private partnership between the Boston Mayor's Office and Greater Boston employers dedicated to closing gender and racial wage gaps. Employers sign the 100% Talent Compact pledging to assess if their organization has wage gaps and, if so, work toward closing them with our help. Kim Borman, BWWC Executive Director, leads the Council.

Every two years the BWWC, in partnership with the Hariri Institute, collects and analyzes payroll data anonymously from its members to show a snapshot of the progress being made to close wage gaps. BWWC now covers 17% of the Greater Boston demographic in their wage gap research. New metrics will be available in December 2025.

In 2023, the BWWC found that the gender wage gap in Greater Boston declined by 30% – from 30¢ to 21¢. This is the first measured progress since the BWWC started reporting in 2016. The BWWC attributes this increase in salaries to two factors, the first being women's advancement into highly paid senior positions. Women in the C-Suite, or the executive-level managers within a company, rose by 3% this year. In addition, women in the level right below C-Suite, first/mid-level officials, saw a 2% increase this year as well. The second factor was the intentionality paid to the issue since the pandemic. Many of the policies put in place due to COVID like schedule flexibility and hybrid work could be helping retain women which is needed for eventual promotion. While this 30% decline in the gender wage gap is significant, it looks only at base compensation, or most often known as an hourly rate, monthly income, or annual salary. When looking at total compensation, which includes both base compensation and performance pay, the gender wage gap increased to 30¢. The BWWC's research proved that on average, men earned over 3x the amount of performance pay as women.

The BWWC analyzes wage gaps beyond just gender, and emphasizes that a prevalent wage gap also exists when you look at the payroll data based on race/ethnicity. White workers earned more in 2023 than non-white workers, with a 27¢ wage gap in base compensation – a 3¢ increase from the 2021 measurement. Looking at total compensation, the racial wage gap increased to 31¢ in 2023 – up from 28¢ in 2021.

In FY24, the BWWC held four quarterly briefings for its members highlighting academic experts and practitioners in the field of gender and racial equity as it relates to pay gaps. The events drew nearly 400 attendees.

Garry Straker, VP of Compensation and Consulting at Salary.com and BWWC Co-Chair Evelyn Murphy discussed pay transparency laws with moderator Tizana Dearing, host of WBUR's Radio Boston.

At our 9th Annual Effective Practices Conference, Megan Ann Greenfield, Partner at McKinsey and Company who leads diversity and inclusion initiatives, discussed the company's recent findings and research. We also released our 2023 data results and hosted a conversation with Beth Chandler, President and CEO of YW Boston and BWWC Council Member.

Ian Matthew-Clayton, VP and Chief Inclusion, Diversity, and Equity Officer for Dana-Farber Cancer Institute, Shirley Leung, Boston Globe Columnist and Editor and Host of the "Say More" podcast, and Eric Nguyen, Director of InclusionBoston at YW Boston had a 60 minute panel discussion about ways to enhance and reshape DEI efforts, moderated by BWWC Executive Director Kim Borman.

Our spring event was our biennial awards ceremony where the BWWC recognizes employers who led the charge on wage equity in Greater Boston by implementing successful policies aimed at closing gender and racial wage gaps, now called the Wage Equity Impact Awards. We had six winners this year who engaged in a panel discussion about their initiatives, moderated by Crystal Haynes, Emmy-winning journalist, Senior Communications Director of United Way of Massachusetts Bay, and former host of GBH's Greater Boston and Basic Black. Winners included: The Bulfinch Companies Inc., Charlestown Nursery School, DiMella Shaffer, State Street, Sun Life, and Trillium Asset Management.

> **FOUR QUARTERLY BRIEFINGS WITH ACADEMIC EXPERTS AND PRACTITIONERS IN THE FIELD OF GENDER AND RACIAL EQUITY AS IT RELATES TO PAY GAPS.**

BWWC Executive Director Kim Borman

> **13 NEW ORGANIZATIONS SIGNED THE 100% TALENT COMPACT IN FY24 MAKING THE TOTAL NUMBER OF EMPLOYEES COVERED IN THE GREATER BOSTON AREA OVER 200,000.**

New Compact Signers

- New England Aquarium
- Racepoint Global
- Benchmark Strategies
- Franklin Cummings Tech
- Acentech
- Perry Dean Rogers Partners Architects
- Rapid7
- MDS/Miller Dyer Spears architects
- FlexProfessionals
- Franklin Templeton
- PwC
- Gale Associates

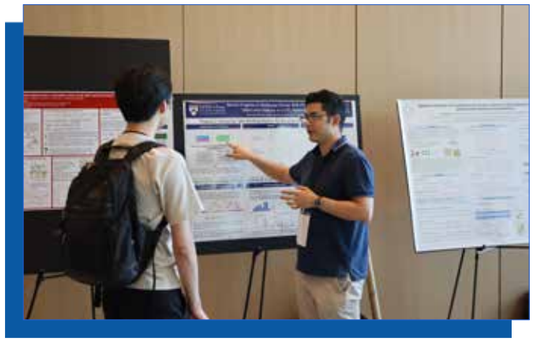
New Anchor Signer

- Beth Israel Lahey Health/BIDMC

CENTER FOR COMPUTATIONAL SCIENCE (CCS)

The Center for Computational Science (CCS) connects BU computational scientists to support collaborations across departments and colleges. Enabling the cross-fertilization of new computational ideas and methodologies, the CCS serves as a conduit for collaborations between experimental researchers who are synthesizing and collecting real-world data and computational researchers and expertise in model building, simulation, and analysis. The Center is led by David Coker, Professor of Chemistry and Materials Science and Engineering.

This year, CCS participated in diverse research and community activities. CCS hosted the 36th annual Workshop on Recent Developments in Electronic Structure (ES24) at BU on June 2nd-5th, 2024. This national conference brought together 20 invited speakers and 180 graduate students, postdocs, and faculty from around the world. The workshop featured hands-on tutorials and discussions of new methods for computing, breakthroughs in computational efficiency and accuracy, and novel applications of these approaches to the study of molecules, liquids, and solids. The event was led by Sahar Sharifzadeh (ENG) and a BU organizing committee of affiliated faculty from the departments of physics and chemistry.



Poster session for ES24 held at the BU Center for Computing & Data Sciences

To develop and extend international research collaborations, CSS hosted a Computational Biophysics and Chemistry Symposium in September featuring presentations by six leading researchers from Kyoto University, Kyushu University, Nagoya University (NU), Japan, and from BU ENG, Mary Dunlop and John Ngo. Additionally a poster session followed the event, highlighting research by CSS affiliated students and postdoctoral associates from the departments of chemistry, computational chemistry and physics.

CCS also hosted three research visitors who gave hour-long seminars on various thematic areas, including simulating quantum dynamical processes, strong coupling light matter interactions, and quantum thermodynamics. These events drew over 100 faculty, students and staff. Speakers included:

Prof. Suggy Jang, Queens College CUNY, “Fermi’s Golden Rule, Master Equation, and Magnus Expansion for Quantum Transitions and Dynamical Processes,” April 25th, 2024

Prof. Abraham Nitzan, UPenn, “Collective response in light-matter interactions: The Interplay between strong coupling, local dynamics, and disorder,” April 29th, 2024

Prof. Yoshitaka Tanimura, Kyoto University, “Classical and quantum thermodynamic theory described by a system–baths model: The minimum work and exothermic principles”, February 21st, 2024

CCS visiting researches at BU’s Marsh Plaza

CSS continued its strong engagement initiated with the FY23 Quantum Convergence FRP. Promoting development of quantum computing applications in high energy and condensed matter physics and quantum chemical applications, CCS researchers developed a collaboration with researchers at Northeastern, UMass Boston, the Massachusetts Green High Performance Computing Center (MGHPCC) and the neutral atom quantum computer company, QuEra. The team submitted a proposal to NSF’s National Quantum Virtual Laboratory (NQVL) initiative to develop the New England Quantum Advantage Institute (NEQAI). This ambitious project includes development of fundamental research in quantum computing applications, workforce development training, and co-design and development of next generation quantum hardware, among other tasks. The project aims to launch our team on a significantly funded long-term research and development program and establishment of a regional center for quantum computing. Future plans include partnering with MassTech and other collaborators to develop an NSF Engine proposal around quantum computing technology development.

CCS researchers also collaborated with faculty from BU Institute for Global Sustainability (IGS) on a submission for a $3 million NSF NRT training grant that looks promising. The proposed project would aim to create a new training program, unifying resources in engineering, chemistry, computer science, and data sciences, to prepare BU PhD students to undertake convergent research to tackle the urgent societal problem of developing sustainable energy conversion and storage.

Publication Highlights

Biswas, S., Zhao, R., Alowa, F. et al. “Exciton polaron formation and hot-carrier relaxation in rigid Dion–Jacobson-type two-dimensional perovskites.” Nat. Mater. 23, 937–943 (2024). https://doi.org/10.1038/s41563-024-01895-z.

Catrina P. Oberg, Leah C. Spangler, David F. Coker, and Gregory D. Scholes. “Chirped Laser Pulse Control of Vibronic Wavepackets and Energy Transfer in Phycocyanin 645,” The Journal of Physical Chemistry Letters 2024 15 (28), 7125-7132, DOI: 10.1021/acs.jpclett.4c01455.

THE CENTER FOR INFORMATION AND SYSTEMS ENGINEERING (CISE)

The Center for Information & Systems Engineering (CISE) is a university-wide research center whose mission is to deepen and broaden interdisciplinary research in the study and design of intelligent systems with broad societal applications. From concepts and algorithms to implementation in software systems and hardware, CISE researchers engage in interdisciplinary and convergent research to advance the science and societal impact of intelligent systems. CISE research has made seminal contributions and impacted a plethora of application areas, from robotics and autonomy, energy systems, computer systems, and communication networks, to medical imaging, computational medicine, video surveillance, and bioinformatics. The Center is led by Ayşe Coşkun, Professor of Engineering and Associate Dean for Research and Development, College of Engineering (July 1st, 2023-June 30th, 2024).

This past year, CISE invited three new faculty affiliates: Gianluca Stringhini (ENG), Tianyu Wang (ENG), and Sabrina Neuman (CAS, CS); the total of CISE affiliated faculty is now 53. CISE faculty published over 124 scholarly papers in FY24, and 14 of those papers were collaborations within the CISE community. Additionally, CISE affiliates received Red Hat Collaboratory Research Incubation Awards in the Small and Speculative Project categories. To raise awareness of affiliated faculty and student work, CISE wrote and promoted 23 faculty and student spotlight stories.

Throughout the year, CISE hosted seminars, workshops, and conferences that have brought together experts from academia, industry, and government to discuss the latest trends and challenges in systems engineering and computer science. On March 4th, CISE and Hariri Institute, in conjunction with BU Government and Community Affairs, co-organized and promoted the grand opening and ribbon cutting for the 2,000-square-foot BU Robotics and Autonomous Systems Teaching and Innovation Center (RASTIC), a $9 million project, supported by BU and the Massachusetts Technology Collaborative (MassTech). The opening event hosted over 200 guests, including Boston University leadership, state dignitaries, and industry leaders. The state-of-the-art facility provides students with hands-on training in robotics, autonomous systems, and AI.

RASTIC Grand Opening Ceremony on March 4th, 2024

On November 10th, CISE hosted the AI for Understanding Earthquakes workshop, in collaboration with La Sapienza Università di Roma. The event featured prominent experts in AI and seismology that highlighted research in AI applications for earthquake predictions and responses. As a result of this collaborative workshop, ENG Professors Brian Kulis, Janusz Konrad, and Prakash Ishwar were awarded a Hariri Institute Focused Research Program titled "AI for Understanding Earthquakes", further enabling interdisciplinary research alliances with major labs in this critical field.

Additionally, Ayşe Coşkun and Ajay Joshi (ENG) were awarded another Hariri Institute Focused Research Program entitled "Privacy Preserving Energy Analytics for Data Centers" with Adam Smith (CAS). Other CISE faculty involved in the project include ENG Professors Michael Caramanis, Alexander Olshevsky, Yannis Paschalidis.

CISE organized a total of 32 events this year, drawing over 1,650 attendees. To promote collaboration with external academic and industry researchers, CISE organized 27 seminars, including four co-sponsored Joint and Distinguished speakers with Hariri Institute. CISE also hosted two visiting researchers through the Resident Scholar Program.

To support student development, the Center organized a Student Best Paper Competition, promoting graduate student original research for which they are listed as the first author. The Center also held the 10th annual CISE Graduate Student Workshop (CGSW 10.0), a day-long symposium for PhD scholars from diverse disciplines to present their original research. This year's event was attended by over 100 faculty, students, and alumni.

CISE CGSW 10.0 held on January 26th, 2024

CISE showcased its innovative work at the AI Expo for National Competitiveness in Washington, DC, a leading robotics conference. The exhibition aimed to enhance visibility and foster relationships with federal and industry stakeholders. At the expo, CISE and Hariri Institute promoted the innovative research and events at BU, including RASTIC and other significant events and projects.

Grant Highlights

"Neuro-Autonomy: Neuroscience-Inspired Perception, Navigation, and Spatial Awareness for Autonomous Robots," Department of Defense and Office of Naval Research. $7.5M. PI: Yannis Paschalidis and Co-PIs: John Baillieul (ENG), Roberto Tron (ENG).

"EMERGE: ExaEpi for Elucidating Multiscale Ecosystem Complex for Robust Generalized Epidemiology," Department of Energy. $450K. Co-PI: Yannis Paschalidis.

"CPS: Medium: Federated Learning for Predicting Electricity Consumption with Mixed Global/Local," National Science Foundation. $1.2M. PI Alexander Olshevsky and Co-PIs Yannis Paschalidis, Michael Caramanis (ENG), Venkatesh Saligrama (ENG).

"AI-powered Performance Analytics for Heterogeneous HPC Systems," Sandia National Laboratories. $495K. PI: Ayşe Coşkun and Co-PIs: Manuel Egele (ENG) and Brian Kulis.

Publication Highlights

J. Hall, L. E. Beaver, C. G. Cassandras and S. B. Andersson, "A Bilevel Optimization Scheme for Persistent Monitoring," 2023 62nd IEEE Conference on Decision and Control (CDC), Singapore, Singapore, 2023, pp. 247-252, doi: 10.1109/CDC49753.2023.10383756.

B. Aksar, et al (A. Coşkun, M. Egele, B. Kulis, collab w Sandia Nat. Lab)., "Runtime Performance Anomaly Diagnosis in Production HPC Systems Using Active Learning," in IEEE Transactions on Parallel and Distributed Systems, vol. 35, no. 4, pp. 693-706, April 2024, doi: 10.1109/TPDS.2024.3365462.

Janusz Konrad, Mertcan Cokbas, Prakash Ishwar, Thomas D.C. Little, Michael Gevelber, "High-accuracy people counting in large spaces using overhead fisheye cameras," Energy and Buildings, Vol 307, 2024, doi.org/10.1016/j.enbuild.2024.113936.

Sarabeth Buckley, Catherine L. Connolly, Jonathan I. Levy, Pamela H. Templer, Jacqueline Ashmore, Luis Carvalho, Nathan Phillips, M. Patricia Fabian, "Carbon, indoor air, energy and financial benefits of coupled ventilation upgrade and enhanced rooftop garden installation: An interdisciplinary climate mitigation approach," Sustainable Cities and Society, Vol 97, 2023, doi.org/10.1016/j.scs.2023.104792.

Wilson, Daniel C. and Acun, Fatih and Jana, Siddhartha and Ardanaz, Federico and Eastep, Jonathan M. and Paschalidis, Ioannis Ch. and Coşkun, Ayşe K., "An End-to-End HPC Framework for Dynamic Power Objectives," 2023, doi.org/10.1145/3624062.3624262.

CENTER FOR RELIABLE INFORMATION SYSTEMS AND CYBER SECURITY (RISCS) AND CYBER ALLIANCE

The Center for Reliable Information Systems and Cyber Security (RISCS) promotes and coordinates high-impact multidisciplinary research and education focused on cybersecurity, cryptography, system reliability, and safe, trustworthy software, and algorithm development. The Center draws on the expertise of 22 faculty and over 100 graduate students from the College of Arts and Sciences, College of Engineering, Faculty of Computing & Data Sciences, Metropolitan College, and Questrom School of Business as well as industry, government, community and established partners. It spearheads the BU Cyber Security, Law, and Society Alliance (Cyber Alliance) — a collaboration between computer science, law, business, and social science researchers to position BU as a leader in the burgeoning global discussion on cybersecurity. RISCS also supports the BU Security Group, advancing research in cryptography and network Through RISCS, this year BU was re-certified as a National Center of Academic Excellence in Information Assurance Education and Research (NCAE-C). The Center is led by co-directors Ran Canetti, Professor of Computer Science, and Mayank Varia, Associate Professor of Computing and Data Sciences.

In FY24, RISCS organized 28 seminars drawing over 550+ attendees. Three Cyber Alliance seminars were organized; speakers included Professors of Law Gaia Bernstein (Seton Hall) and Haochen Sun (University of Hong Kong) and Datasphere Initiative Co-Founder Carolina Rossini. Moreover, RISCS sponsored, 19 RISCS-BUSec Cryptography Seminars, and six Practical Security Seminars.

CS& LAW
ComputerScienceAndLaw

RISCS was instrumental in hosting the Third Computer Science and Law Symposium at BU in March 2024. The symposium is a centerpiece for the burgeoning community of joint CS and law research, and placing it at BU underlines the prominence of BU faculty and students in this new field. Ran Canetti co-chaired the symposium's program committee; Stacey Dogan (LAW) served as a program committee member; and Mayank Varia chaired local arrangements.

Stacey Dogan with Hariri Institute also co-hosted the October 25th BU Research on Tap panel entitled "Towards Responsible AI: Privacy, Fairness, and Accountability.," Speakers included RISCS and other Hariri Institute faculty affiliates including Mark Crovella (CAS, Computer Science), Tesary Lin (Questrom), Yannis Paschalidis (ENG), Andrew Sellars (LAW), Adam Smith (CAS, Computer Science), Chris Chao Su (COM), and Marshall Van Alstyne (Questrom).

RISCS engaged in a number of high-impact research collaborations:

In a joint effort, RISCS researchers from CS and Law submitted a response to a request for comments by the National Telecommunications and Information Administration (NTIA) at the Department of Commerce regarding the regulation of AI systems. The opinion has been cited multiple times by the summary document issued by the NTIA.

In a culmination of a multi-year effort, the Israeli Ministry of Health published an anonymized dataset of all births in Israel on February 24th; this is one of the most significant applications of differential privacy by a government statistics organization outside the US and was designed and carried out by RISCS researchers.

RISCS hosted the preparation and the research leading to the NSF interdisciplinary, multi-institution GCR (growing convergence research) project led by BU Physics, CS and Mathematics faculty, with participation of Cornell University and the University of Southern Florida. This is a $2.5 million, five-year program that is bound to have significant impact on novel, physics-inspired design of cryptographic algorithms.

RISCS continued its contribution and participation in the Quantum Convergence Initiative (QCI). RISCS contributed a year of PhD student RAship to the QCI and hosted the preparation of a successful joint proposal for the NSF interdisciplinary GCR program. RISCS also enabled cross-disciplinary teaching and research across CS and Physics.

With the Questrom School of Business, RISCS initiated a collaboration with the Center for Research toward Advancing Financial Technologies (CRAFT) at Boston University led by Eran Tromer (CAS, CS).

Student Accolades

Ari Karchmer (CS PhD 2024, advised by Ran Canetti) was awarded the Best Student Paper award at the Innovations in Theoretical Computer Science Conference (ITCS 2024) for "Distributional PAC-Learning from Nisan's natural proofs."

Shlomi Hod was invited to Washington D.C. to present a workshop to congressional staff on the ethical, legal, and societal implications of AI with the goal of improving congressional staffers' Responsible AI literacy.

Shlomi Hod at the Capitol with his co-presenters of the Operationalizing Responsible AI Congressional Workshop

Publication Activity

RISCS researchers have published over 60 papers this year, in a variety of areas. A non-exhaustive list includes quantum computation, complexity, and cryptography; foundational and applied cryptography; system security; foundational and applied data privacy; trustworthy AI; public policy; mechanism design.

DIGITAL HEALTH INITIATIVE (DHI)

The Digital Health Initiative (DHI) focuses on the essential role digital technologies play in the health and wellness of populations, and the integration of these technologies into people's lives and health systems. DHI projects span AI, computing and data sciences, medical informatics, computational biology, healthcare technology and automation, health behavior change, and healthcare delivery. This year, a number of initiatives were organized that advanced DHI goals, including funding for research, research talks, and seminar series.

For the second year, the Institute issued a special funding call for proposals for the DHI initiative, which is cosponsored by the Hariri Institute, the BU School of Public Health Population Health Data Science Program, the Clinical and Translational Science Institute, and the Evans Center for Interdisciplinary Biomedical Research. On February 6th, 2024 an event was organized for researchers to learn about the proposal call and featured presentations from clinicians and faculty researchers from diverse disciplines spanning the scope of DHI disciplines and covering diverse medical applications such as gynecology, health equity, infectious diseases, medical imaging, neurological and psychiatric disorders, oncology, opioid use, urban firearm violence, cell biology, and tissue engineering. On May 15th, it was announced that DHI FRPs were awarded to: (1) Clare Poynton (Chobanian & Avedisian SOM) and Kayhan Batmanghelich (ENG), who will lead a project on "Enhancing Models for Breast Cancer Risk Prediction and Bias Mitigation through Clinician AI Collaboration", and (2) Xin Zhang (ENG), and Chad Farris (Chobanian & Avedisian SOM) who will lead a project on "Multimodal Transformer Architectures for Neuropathology Study of Alzheimer's Disease."

Health Data Science Focused Research Program Funding Event held at the BU Medical Campus on February 6th, 2024

The Institute cosponsored six Health Data Science Distinguished Speaker seminars with the BU School of Public Health Population Health Data Science Program, the BU School of Public Health Department of Biostatistics, and the Providence/Boston Center for AIDS Research (CFAR), attended by over 560+ faculty, students and staff.

Health Data Science Distinguished Speaker Tamara Broderick Event Graphic

The Institute continued collaborative work with the BU Center on Emerging Infectious Diseases (CEID), cosponsoring two events. A panel discussion on "Reflecting On One Year of MPOX Response" was held August 17th, 2023, to identify best practices from the MPOX response to future infectious diseases threats. Moderated by CEID Director Dr. Nahid Bhadelia, the event featured opening remarks from Dr. Ashish Jha, Dean of Brown University's School of Public Health, and panelists Dr. Nikki Romanik, Chief of Staff of the White House Office of Pandemic Preparedness and Response Policy; Dr. Demetre Daskalakis, Deputy Coordinator of the White House National Monkeypox Response Team; Dr. Céline Gounder, CBS News Medical Contributor, Senior Fellow and Editor-at-Large for Public Health at KFF and KFF Health News; and Adrianna Boulin, Director of Community Impact and Engagement at Fenway Health. The hybrid event drew over 194 attendees (54 in-person; 140 zoom). On April 8th, the Institute welcomed Melissa Fleming, United Nations Under Secretary General for Global Communications, for a lecture titled "Building Resilience: The Transformative Role of AI in Global Public Health Communication." Flemming shared insights into the United Nations' perspective on harnessing AI to build resilience in global communications. The hybrid event was attended by 133 (88 in-person; 45 zoom) faculty, students and staff.

This was the second year that DHI co-sponsored the Machine Learning in Medicine (MLxMed) Seminar Series. This multi-institutional series focuses on new algorithms, real-world deployment, and future trends in machine learning for supporting, enabling and improving medical discovery and clinical decision making in areas such as medical imaging, cancer diagnostics, precision medicine, clinical trials, and predictive modeling based on electronic health records. Series cosponsors include University of Pittsburgh, University of Pittsburgh Medical Center, and University of Toronto and is hosted at BU by Kayhan Batmanghelich (ENG). In FY24, 18 seminars were organized with an estimated 1,230+ number of attendees.

DHI affiliated faculty also received three new grants (from DoE, NSF, and Merck Research) and had multiple papers published.

MLxMED Seminar Series Saeed Hassanpour Event Graphic

Selected Publication Highlights

Yannis Paschalidis (ENG), Rhoda Au (Chobanian & Avedisian SOM) and Vijaya Kolachalama (Chobanian & Avedisian SOM) and collaborators published "Prediction of Alzheimer's disease progression within 6 years using speech: a novel approach leveraging language models" in Alzheimer's & Dementia: The Journal of the Alzheimer's Association. (doi.org/10.1002/alz.13886).

Kayhan Batmanghelich, with collaborators, published a paper that uses anatomy-aware generative AI and explainable AI methods to improve synthesizing 3D images with specific abnormalities. (Xu Y, Sun L, Peng W, Jia S, Morrison K, Perer A, Zandifar A, Visweswaran S, Eslami M, Batmanghelich K. MedSyn: Text-guided Anatomy-aware Synthesis of High-Fidelity 3D CT Images. IEEE Trans Med Imaging. 2024 Jun 20;PP. doi: 10.1109/TMI.2024.3415032.)

DHI faculty researchers published several papers as part of the NSF Predictive Intelligence for Pandemic Prevention (PIPP) grant, including: Jingmei Yang, Kenji C. Walker, Ayse A. Bekar-Cesaretli, Boran Hao, Nahid Bhadelia, Diane Joseph-McCarthy, Ioannis Ch. Paschalidis, "Automating biomedical literature review for rapid drug discovery: Leveraging GPT-4 to expedite pandemic response," International Journal of Medical Informatics, Volume 189, 2024, doi.org/10.1016/j.ijmedinf.2024.105500; and Eugenio Paglino Dielle J. Lundberg, Elizabeth Wrigley-Field, and Andrew C. Stokes, "Excess natural-cause mortality in US counties and its association with reported COVID-19 deaths," PNAS. February 1, 2024. 121 (6) e2313661121. doi.org/10.1073/pnas.2313661121.

MASS OPEN CLOUD (MOC) ALLIANCE

The Mass Open Cloud (MOC) Alliance, launched in 2013, has transformed into the MOC Alliance – a partnership between higher education, government, and industry to create an open production cloud which will provide domain researchers with predictable low-cost services while enabling innovation by a broad community of academic researchers and industry collaborators. The MOC Alliance supports and coordinates a set of interrelated projects, including production cloud services supported institutionally by BU and Harvard University, a national testbed for cloud researchers, the $20 million Red Hat Collaboratory at BU, and a planned national center on cloud and datacenter-scale computing. The MOC Alliance is led by Orran Krieger (ENG).

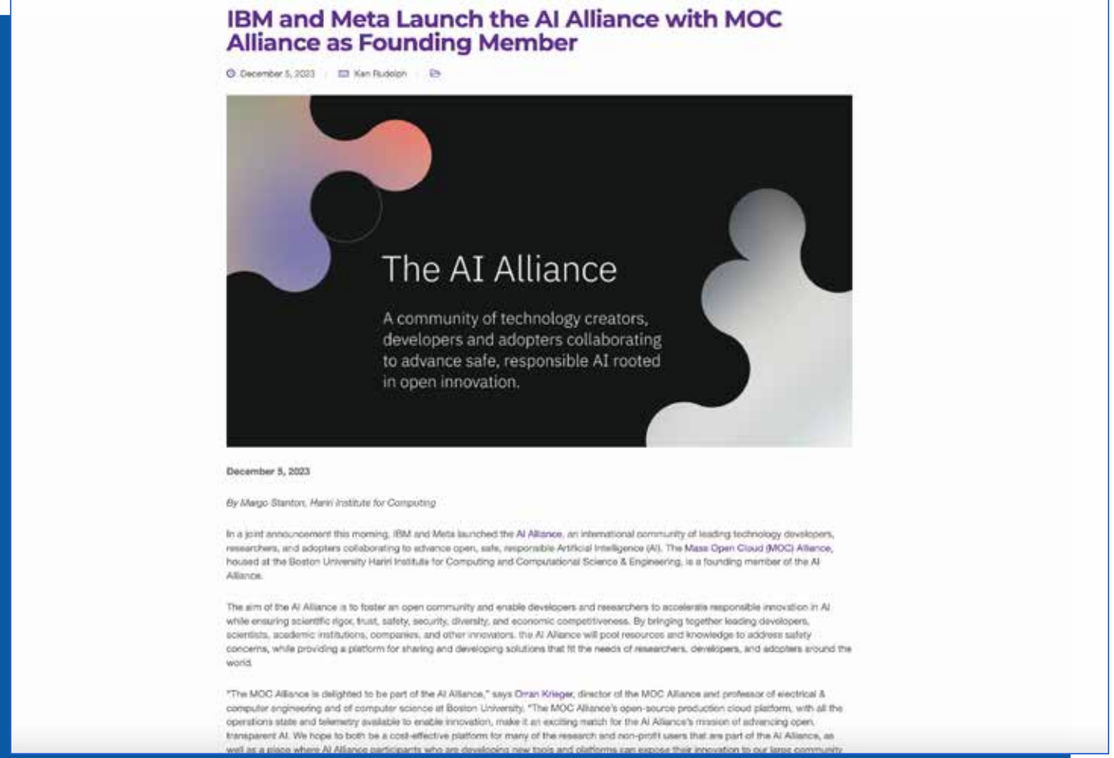
In March, the MOC Alliance hosted its annual workshop. The two-day hybrid event featured over 35 targeted speakers, 250 in-person attendees, hundreds of virtual attendees, including 34 companies, 16 institutions of higher education, and multiple government agencies. The workshop was divided into four sections: AI and the AI Alliance, the Marriage of Data and Compute, the Open Cloud and Governance and Partnerships, Education, Support for System Research, and User Outreach Facilitation.

2024 MOC Alliance Workshop

The MOC Alliance provides administrative management of the New England Research Cloud (NERC), an affordable production cloud powered by high-performance GPUs that is operated by BU and Harvard Research IT and was founded with a $875,000 award from the Massachusetts Technology Collaborative (MTC). This year, MOC Alliance Director Orran Krieger received a $1.3 million MTC award that will be used to accelerate the expansion of the NERC's capabilities. Additionally, with a unique consumption model with Lenovo, the NERC deployed 64A100 GPUs into the datacenter in Holyoke in March. This acquisition reduces the time to complete extensive training models, which attracts many AI researchers to the NERC. NERC production services were also made available to general research and education users this year; NERC services are currently used by the core MOC institutions, BU, Harvard, Northeastern, MIT, UMASS and Yale as well as Boston Children's Hospital, Code for Boston, Bentley, WPI, URI and several others.

Krieger was also awarded a $750,000 National Science Foundation Collaborative Award with Northern University. The award will be used to establish The Center for Systems Innovation at Scale (i-Scale), an industry-university research partnership that will explore unique challenges of computing systems at large scale, across software, networking, and hardware layers, seeking answers to problems of pre-competitive research. Industry leads met in March to discuss research themes of the program and will convene in the fall to establish which faculty projects will be funded.

In December, the MOC Alliance became a founding member of the AI Alliance, launched by IBM and Meta. Comprised of an international community of leading technology developers, researchers, and adopters, the AI alliance aims to foster an open community to advance open, safe, responsible AI.



IBM and Meta Launch the AI Alliance with MOC Alliance as Founding Member

December 5, 2023 | Kan Rudolph

The AI Alliance

A community of technology creators, developers and adopters collaborating to advance safe, responsible AI rooted in open innovation.

December 5, 2023

By Margo Stanton, Hariri Institute for Computing

In a joint announcement this morning, IBM and Meta launched the AI Alliance, an international community of leading technology developers, researchers, and adopters collaborating to advance open, safe, responsible Artificial Intelligence (AI). The Mass Open Cloud (MOC) Alliance, housed at the Boston University Hariri Institute for Computing and Computational Science & Engineering, is a founding member of the AI Alliance.

The aim of the AI Alliance is to foster an open community and enable developers and researchers to accelerate responsible innovation in AI while ensuring scientific rigor, trust, safety, security, diversity, and economic competitiveness. By bringing together leading developers, scientists, academic institutions, companies, and other innovators, the AI Alliance will pool resources and knowledge to address safety concerns, while providing a platform for sharing and developing solutions that fit the needs of researchers, developers, and adopters around the world.

"The MOC Alliance is delighted to be part of the AI Alliance," says Orran Krieger, director of the MOC Alliance and professor of electrical & computer engineering and of computer science at Boston University. "The MOC Alliance's open-source production cloud platform, with all the operations state and telemetry available to enable innovation, make it an exciting match for the AI Alliance's mission of advancing open, transparent AI. We hope to both be a cost-effective platform for many of the research and non-profit users that are part of the AI Alliance, as well as a place where AI Alliance participants who are developing new tools and platforms can expose their innovations to our large community

The MOC Alliance announces the launch of the AI Alliance as a founding member

RED HAT COLLABORATORY

A partnership between Red Hat and Boston University, the Red Hat Collaboratory connects BU faculty and students with industry practitioners working in open-source software communities. Through BU and Red Hat's $20 million expanded partnership, announced in 2021, the Red Hat Collaboratory seeks to create more trustworthy, reliable, scalable, self-operating, distributed, heterogeneous compute platforms that stretch from edge devices to cloud datacenters.

The Red Hat Collaboratory also enables innovative partnerships between academic researchers and open source communities. Collaboration in systems research at this scale can have a profound impact on society. Projects funded through the Red Hat Collaboratory Research Incubation Award are open source and focus on problems of distributed, operating, security, or network systems whose solutions show promise for advancing their fields and impacting the tech industry.

This year, the Red Hat Collaboratory awarded 12 projects to BU faculty members and industry collaborators, totaling more than $1.8 million in funding. The Collaboratory also funded the Software & Application Innovation Lab (SAIL) at Boston University with $330,000 to enable software development and integration that is needed to support new New England Research Cloud (NERC) projects. SAIL collaborates with Red Hat engineers while actively introducing faculty to the NERC.

Speculative projects

- Jonathan Appavoo (CAS, Computer Science), Symbiotes: a new step in Linux's evolution
- Manuel Egele (ENG), Lock 'n load: deadlock detection in binary-only kernel modules
- Eshed Ohn-Bar, (ENG), Minimal mobile systems via cloud-based adaptive task processing

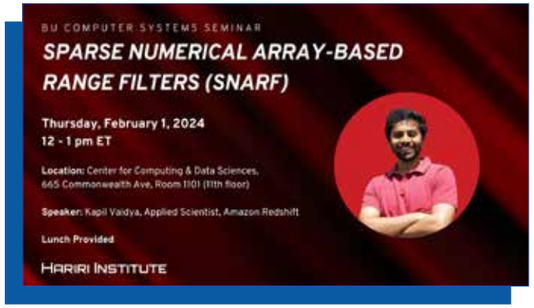
Small projects

- David Starobinski (ENG), Improving cybersecurity operations using knowledge graphs
- Jonathan Appavoo (CAS, Computer Science), Optimizing kernel paths for performance and energy
- Martin Herbordt (ENG), Practical programming of FPGAs with open source tools
- Vasia Kalavri (CAS, Computer Science), Towards high performance and energy efficiency in open source stream processing
- Ajay Joshi (ENG), CoFHE: compiler for fully homomorphic encryption
- Martin Herbordt (ENG), DISL: a dynamic infrastructure services layer for reconfigurable hardware
- Jonathan Appavoo, (CAS, Computer Science), Discovering opportunities for optimizing OpenShift energy consumption
- Manuel Egele (ENG), HySe: hypervisor security through component-wise fuzzing
- Eshed Ohn-Bar (CAS), Co-Ops: collaborative open source and privacy-preserving training for edge and automotive AI

The Red Hat Collaboratory funded Student Research Projects geared towards providing BU students with research and experiential learning opportunities that advance open source projects in cloud computing, systems engineering infrastructure, and security. Eleven undergraduates received funding for open-source projects, totaling $122,000, that aim to improve the security, efficiency, and intelligence of computing systems.

This year, project recipients of the Red Hat Collaboratory 2023 and 2024 Research Incubation Awards were recognized for excellence at preeminent research conferences, including "On-the-fly Data Transformation in Action," (https://disc.bu.edu/papers/vldb23-mun) which received the Best Demo Award at the 2023 Proceedings of the Very Large Data Bases (VLDB) Endowment, and "Optimal Control of Connected Automated Vehicles with Event-Triggered Control Barrier Functions: a Test Bed for Safe Optimal Merging," (doi: 10.1109/CCTA54093.2023.10253379), which was selected as the Outstanding Student Paper at the 2023 IEEE Conference on Control Technology and Applications (CCTA) . Project recipients also received seven grant awards including $1.8 million from five National Science Foundation (NSF) awards.

The Red Hat Collaboratory also supports the BU Computer Systems Seminar and Red Hat Colloquium Series which hosted 24 events throughout the year featuring BU faculty members, Red Hat engineers, student research presentations, and international researchers with expertise in systems engineering. The series attracted 960 attendees.



BU Computer Systems Seminar Graphic

The Red Hat Collaboratory has been co-led by Orran Krieger (ENG) and Hugh Brock (Red Hat) since its inception in 2016. In April, Hugh Brock transitioned to new opportunities as Senior Director, Product Software Architecture and Engineering at Equinix. We wish him success and look forward to ongoing research collaborations with him in his new role.

Hugh Brock at the 2024 MOC Alliance Workshop

SOFTWARE APPLICATION AND INNOVATION LAB (SAIL)

SAIL is the premier professional research, software engineering, and consulting lab within the Hariri Institute. SAIL acts as both a driver and a collaborative partner in the creation of cutting-edge solutions for the data-driven, computational, and software engineering aspects of research across the university and beyond. SAIL's range of services includes full-stack web and mobile application development, code base refactoring and maintenance, software best-practice consulting, project and product management guidance, and assistance with proposal and grant writing to secure extramural funding for research projects.

SAIL was awarded a $330,000 Red Hat Collaboratory grant to support research and development from many different domain science areas into the NERC. For David Boas (ENG), SAIL continued its contribution to adding features to a web user interface tool used to facilitate creating, managing, and sharing fNIRS neuroimaging datasets across the community. For BU's DAMP Lab, led by Douglas Densmore (ENG), SAIL is developing a web-based tool that improves workflow and information access for microbiological researchers and clinical services.

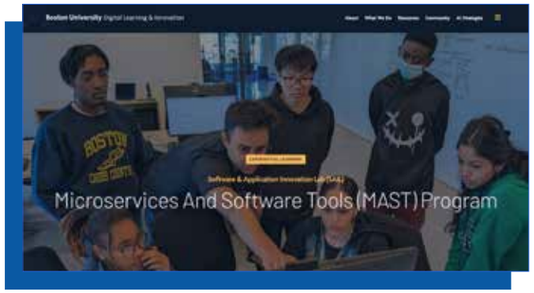
SAIL engaged in new multidisciplinary projects focused on improving healthcare and patient outcomes through technology advances. SAIL engaged with the Biomedical Innovation Technologies Affinity Research Collaborative (BIT-ARC), an initiative led by the Evans Center for Interdisciplinary Biomedical Research with collaborative support with the Clinical & Translational Science Institute and Office of Technology Development. For the project, SAIL developed a web-based application that houses a machine learning algorithm for a BIT-ARC project designed to automate measurement and analysis of kidney glomerular ultrastructure. The BIT-ARC project is led by Chobanian & Avedisian SOM Professors Weining Lu (MD), Chao Zhang (PhD), Joel Henderson (MD), and Vijaya Kolachalama (PhD) and SAIL Director William Tomlinson (PhD). SAIL also played a key role in the technical development of the Life Impact Burn Recovery Evaluation (LIBRE) Profile, collaborating with clinicians and researchers of the Spaulding Rehabilitation Center at Mass General Brigham and the LIBRE team at BU SPH. The LIBRE Profile is a mobile application designed to assess the social recovery of burn survivors. LIBRE Profile development was funded by The App Factory, which is supported by the National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR) within HHS.

SAIL is also collaborating on innovative research projects aimed at strengthening equity in and through education. For Naomi Caselli (Wheelock), SAIL is advancing development of the ASL-LEX, a database of lexical and phonological properties of American Sign Language signs designed to facilitate collaborative and/or independent research. In collaboration with TJ McKenna (Wheelock), SAIL is developing the STEM EquityCoach, a web application designed to address the critical need for culturally relevant and inclusive STEM education in K-12 settings.

SAIL initiated new collaborations with researchers of the Center for Space Physics. For Marianna Felici and Paul Withers, SAIL developed a web application that allows for the simulation of microbial communities. The SAIL-developed application utilizes the COMETS (Computation Of Microbial Ecosystems in Time and Space) tool to simulate the complex growth patterns of bacterial colonies. SAIL also helped develop refactor software for the NASA-sponsored Lunar Environment heliospheric X-ray Imager (LEXI), an x-ray telescope which will be going to the moon later this year. The project was led by Brian Walsh (ENG).

SAIL also engaged with the Global Development Policy Center on work for the China's Overseas Development Finance database. SAIL developed a web application that enables the scraping, language translation, consolidating, and generation of recommended content/article labels for information sourced from websites of interest.

A major area of expansion for SAIL was its software internship program, a pathway to enhanced experiential learning opportunities for undergraduate and graduate students and partnerships with larger research centers and organizations within BU. SAIL was awarded a Shipley Center for Digital Learning and Innovation award to pilot the SAIL Microservices And Software Tools (MAST) program for BU students interested in developing microservices and software tools for university research (under the supervision of a SAIL Engineer). Entering its second year, the MAST program has successfully generated outcomes for five research projects, while providing enhanced experiential learning opportunities for 15 students. Additionally, SAIL received a Massachusetts Life Science Center Grant that provides internships to computer science and data science students. SAIL will use these resources to continue to provide impact to student learning outcomes, while driving the progress of university research and creating leadership opportunities for its technical staff. SAIL also initiated a collaboration with Boston University Academy (BUA) to conduct hands-on coding seminars to enhance student software engineering and machine learning skills. The same collaboration spawned a pilot project, with the help of BUA Leadership, that provides their high school seniors with SAIL internship opportunities, enabling them to contribute to actual research projects as part of their senior thesis project.



BU Digital Learning & Innovation article on the MAST Program

SAIL COLLABORATES WITH 80+ FACULTY MEMBERS ACROSS 20+ DEPARTMENTS.

SAIL PORTION OF SUBMITTED PROPOSALS ($3.1M).

RECEIVED OVER 50 APPLICATIONS FOR SOFTWARE ENGINEERING INTERNSHIPS (2 SELECTED).

15 ACTIVE PROJECTS

BU AI TASK FORCE

Generative Artificial Intelligence (GenAI) is poised to have a transformative impact on education and research. While presenting incredible opportunities for innovation and knowledge creation, GenAI also raises challenges related to academic integrity, intellectual property, security, skill acquisition and retention, and future job security. Recognizing the need for a unified approach, BU Provost ad interim Kenneth Lutchen (ENG) established the AI Task Force in September 2023 to help guide BU in responsibly addressing GenAI in education and research.

Led by Professors Yannis Paschalidis and Wesley Wildman (STH, CDS), the task force is comprised of faculty experts from diverse disciplines (including the sciences, engineering, humanities, law, business, and education). The task force was charged with developing specific recommendations for how generative AI can be used successfully in education and research, as well as policies and best practices regarding the use of AI by students and faculty to help prevent its misuse or negative impact.

The culmination of the task force's work was a report released in April that informs and educates faculty, and advises the BU administration on issues related to the use of GenAI tools in education and research. The report contains many important observations, policy proposals, and best practice guidelines, as well as examples for where caution is warranted. A key recommendation is to "critically embrace" the use of GenAI.

In addition to the report, the task force developed several resources: (1) an analysis of GenAI detector reliability, providing a practical guide for faculty as they consider how to detect GenAI material in student submissions; (2) a web-based app that provides a searchable repository of GenAI policy and advice documents from institutions of higher education; and (3) semantic network and topic modeling analyses of these policy documents.

The full BU AI Task Force report and supplemental resources can be found on the Hariri Institute for Computing website (www.bu.edu/hic).

Task force members:

Yannis Paschalidis, (Co-Chair) Distinguished Professor of Engineering, College of Engineering; Founding Professor of Computing & Data Sciences; Director, Rafik B. Hariri Institute for Computing and Computational Science & Engineering

Wesley J. Wildman, (Co-Chair) Professor of Philosophy, Theology and Ethics, School of Theology; Founding Professor of Computing & Data Sciences and Chair of Faculty Affairs, Faculty of Computing & Data Sciences

Mary Churchill, Associate Dean for Strategic Initiatives & Community Engagement; Professor of the Practice and Program Director, Higher Education Administration, Wheelock College of Education & Human Development

Mark Crovella, Professor of Computer Science, College of Arts & Sciences; Founding Professor of Computing & Data Sciences and Chair of Faculty Affairs, Faculty of Computing & Data Sciences

Anne Danehy, Associate Dean of Academic Affairs; Associate Professor of the Practice, College of Communication

Pary Fassihi, Senior Lecturer, Arts & Sciences Writing Program, College of Arts & Sciences

Juliet Floyd, Borden Parker Bowne Professor of Philosophy, College of Arts & Sciences; Director, BU Center for the Humanities

Priya Garg, Associate Dean, Office of Medical Education, Chobanian & Avedisian School of Medicine

Amie Grills, Associate Provost for Undergraduate Affairs; Professor of Counseling Psychology & Applied Human Development, Wheelock College of Education & Human Development

Tal Gross, Associate Professor of Markets, Public Policy & Law, Questrom School of Business

Wendy Heiger-Bernays, Clinical Professor of Environmental Health, School of Public Health

Keith Hylton, William Fairfield Warren Distinguished Professor; Professor of Law, School of Law

Daniel Kleinman, Associate Provost for Graduate Affairs; Professor of Sociology, College of Arts & Sciences

Gail McCausland, Assistant Dean of Academic Affairs; Clinical Professor of Periodontology, Henry M. Goldman School of Dental Medicine

Matt Parfitt, Associate Professor of Rhetoric, College of General Studies

Wilson Wong, Associate Professor of Biomedical Engineering, College of Engineering

BU AI task force members were assisted by Deidre Fisher, project manager for strategic initiatives in the Office of the Provost.

STRATEGIC COMMUNICATIONS AND MARKETING

In FY24, the Hariri Institute engaged in strategic communications and marketing to elevate awareness of the Institute and its affiliate centers, initiatives, faculty, and students. Stories highlighting diverse research disciplines were written and promoted through public relations, social media, and newsletters. Additionally, marketing created videos and microsites promoting faculty-driven initiatives. Through these efforts, marketing raised the visibility of the Institute and its affiliates, achieving broad coverage in media and across social channels.

Editorial Content: The Institute's marketing staff wrote 48 stories highlighting faculty, student and Institute work. Additionally, marketing created four promotional videos to raise visibility of faculty-led initiatives, including for computational humanities research led by Cathie Jo Martin (CAS, Political Science), for the Robotics & Autonomous Systems Teaching and Innovation Center (RASTIC) led by Kenneth Sebesta (ENG), for the AI and Education Initiative led by Naomi Caselli (Wheelock) and for AI-driven Alzeimer's research led by Yannis Paschalidis.

Press Coverage: There were 277 media stories mentioning Hariri Institute with over 4,500 total engagement on X (shares, comments, or likes). The stories appeared in prominent outlets such as The Boston Globe, The Boston Herald, Futurity, Health Brew, Reuters Today, WBUR, WBZ Radio, as well as vertical press. The FY24 earned media coverage, based on the viewership, brand strength and reach of media outlets, is equivalent to $4.7 million worth of advertising in the same outlets.

Website: Hariri Institute website averaged monthly page views of 13,294 in FY24. To support faculty-led initiatives, marketing developed three microsites hosted on the Hariri Institute website for the BU AI Task Force, Quantum Convergence, and ES24 national conference, garnering 6,630 page views.

Social Media: Hariri Institute continued to achieve growth across LinkedIn, X, Instagram, and Youtube. The Institute grew its follower base to over 4,400, an increase of over 30 percent. Total engagement was over 3,000, an over 18% increase from the previous year.

Events: Hariri Institute organizes and supports a diverse range of events, often highlighting high-impact multidisciplinary research in collaboration across and external to BU. The Institute's Distinguished Speaker Seminars bring renowned global researchers across academia, industry, non-profit organizations, and government to speak at Boston University. The Institute also organizes seminars featuring expert speakers across the research domains of the Institute's centers and initiatives. Large scale research symposiums and workshops are also organized throughout the year.

In FY24, the Institute organized and cosponsored 215 events with an estimated total attendance of 9,000+. The majority of Institute events are in-person, facilitating opportunities for the meet and exchange of ideas with colleagues with similar interests in interdisciplinary research.

June 25, 2024 - The Brink, "AI Program for Early Alzheimer's Detection" featured published research led by Yannis Paschalidis (ENG) with Chobanian & Avedisian SOM Professors Vijaya B. Kolachalama and Rhoda Au, and collaborators. Globally covered in prominent media, including Wall Street Journal, Boston Herald, and National Public Radio, among others.

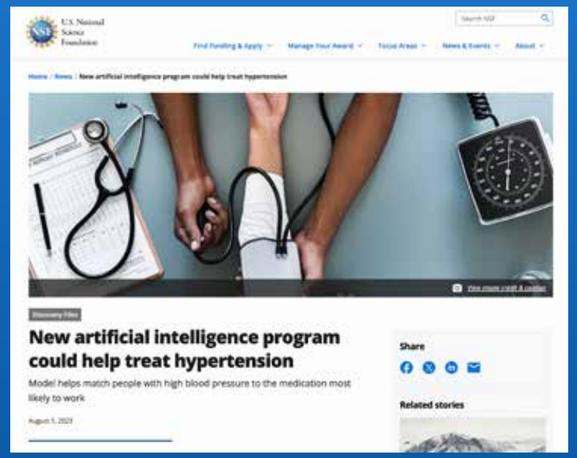
FY24 COMMUNITY ENGAGEMENT & PROMOTION

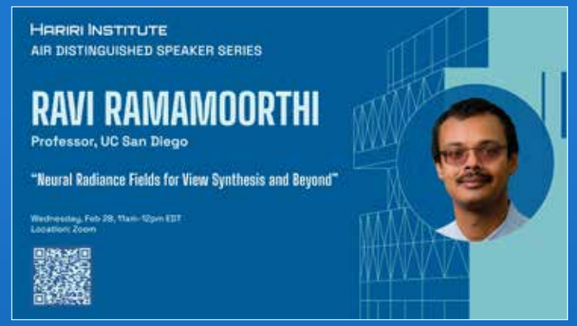
277
Press Stories and Media Mentions

48
Hariri Institute Authored Stories

1
NSF News Research Story

6
Of the *BU Brink*'s Top Stories of 2023





$4.7M
Estimated Advertising Equivalency of Earned Media

3K+ (+18%)
Total Engagement

4.4K+ (+30%)
Total Followers

215
Events

9,000+
Total Attendees

HARIRI INSTITUTE AWARDS

2024 Hariri Institute Community Recognition Awards

The 2024 Hariri Institute Community Recognition Awards celebrate Hariri Institute personnel whose contributions have been instrumental in helping to bring success to their team and to our organization. This program also aims to raise awareness of the important work that transpires, at all levels, within the Institute and broaden understanding of how personnel efforts help advance the Institute's mission. Award recipients were selected through voting by the community.

AI and Education Initiative Awards at the Hariri Institute Community Recognition Awards Ceremony on May 30, 2024.

Hariri Institute Community Recognition Awards recipients at the awards ceremony on May 30, 2024.

2024 Award Recipients

Distinguished Service Award

Recipient: Emily Johnson, Associate Director, Research Administration, Hariri Institute

Finalists: Katherine D'Angelo, Assistant Director, Program and Events, Hariri Institute

Innovation Award

Orran Krieger, Director, MOC Alliance, Co-Director, Red Hat Collaboratory, Professor, Electrical & Computer Engineering, Computer Science, Boston University

Student Excellence Award

Rishi Shah, Computer Science, Software Engineer Intern, SAIL

Margaret Stanton, International Relations and Chinese Language and Literature, Marketing Assistant, Hariri Institute

Johnathan Eaton, International Relations and National Security Studies, Office Assistant, Hariri Institute

Ross Mikulskis, Computer Science, Cloud Engineering Intern, MOC Alliance/Red Hat Collaboratory

Excellence in Service Award

Maureen Stanton, Assistant Director of Marketing & Communications, Hariri Institute

Jennifer McDonough, Administrative Manager, Boston Women's Workforce Council (BWWC)

Team Player Award

Ken Rudolph, Marketing & Communications Specialist, MOC Alliance/Hariri Institute

Diversity, Equity and Inclusion (DEI) Award

Ziba Cranmer, Director, BU Spark! (FCDS), Steering Committee Member, Hariri Institute

STUDENT ACCOLADES

Cansu Demikran, PhD candidate advised by Ajay Joshi (ENG), was selected as one of the 2024 ML and Systems Rising Stars.

Farbin Fayza, PhD student advised by Ajay Joshi (ENG), received the Institute for Global Sustainability (IGS) Summer Fellowship.

Shlomi Hod, PhD candidate advised by Ran Canetti (CAS, CS) was invited to Washington D.C. to present a workshop to congressional staff on the ethical, legal, and societal implications of AI with the goal of improving congressional staffers' Responsible AI literacy.

Ari Karchmer, CS PhD 2024 advised by Ran Canetti, was awarded the Best Student Paper award at the Innovations in Theoretical Computer Science Conference (ITCS 2024) for "Distributional PAC-Learning from Nisan's natural proofs."

Chen Ling, Hariri Institute GSF and PhD candidate advised by Gianluca Stringhini (ENG), has been selected to attend the 2023 EECS Rising Stars Program.

ENG PhD candidates **Ehsan Sabouni**, advised by Christos Cassandras (ENG), and **H. M. Sabbir Ahmad**, advised by Wenchao Li (ENG), received the 2023 IEEE Conference on Control Technology and Applications (CCTA) Best Student Paper Award for "Optimal Control of Connected Automated Vehicles with Event-Triggered Control Barrier Functions: a Test Bed for Safe Optimal Merging." doi: 10.1109/CCTA54093.2023.10253379.

Lingyi Xu, Hariri Institute GSF and CDS PhD student advised by Vijaya Kolachalama (Chobanian & Avedisian SOM), received the BU Women's Guild Scholarship.

FACULTY RECOGNITION

Clarivate's 2023 World's Most Influential Researchers

Sandro Galea (Dean, Robert A. Knox Professor, School of Public Health).

Benjamin Sovacool (Professor, College of Arts & Sciences, Department of Earth & Environment; Director, Institute for Global Sustainability).

Eugene Stanley (Professor Emeritus, College of Arts & Sciences, Department of Physics).

Curtis Woodcock (Professor, College of Arts & Sciences, Department of Earth & Environment).

Distinguished Society Fellowships & Awards

Siddharth Ramachandran (ENG), named AAAS Fellow.

Daniel Segrè (CAS, Biology), named AAAS Fellow.

Cara Stepp (Sargent), named AIMBE Fellow.

Distinguished Foundation Fellowships & Awards

Rhoda Au (Chobanian & Avedisian SOM), awarded the 2023 Melvin R. Goodes Prize for Excellence in Alzheimer's Drug Development by the Alzheimer's Drug Discovery Foundation.

Chuanfei Dong (CAS, Astronomy), named Sloan Research Fellow.

Vivek Goyal (ENG), named Guggenheim Foundation Fellow.

Jaime Gradus (SPH), awarded the Carol J. Rowland Hogue Award for Outstanding Mid-Career Achievement by the Society for Epidemiologic Research.

Lucy Hutyra (CAS, Earth & Environment), named MacArthur Foundation Fellow.

Swathi Kiran (Sargent), received Honors of the Association from the the American American Speech-Language-Hearing Association, the highest award bestowed by ASHA.

Hadi Nia (ENG), named Sloan Research Fellow.

Alex Sushkov (CAS, Physics), named to the Gordon and Betty Moore Foundation's 2023 cohort of Experimental Physics Investigators.

Priscilla Slanetz (Chobanian & Avedisian SOM), received the 2023 Honored Educator Award from the Radiological Society of North America (RSNA).

Distinguished Awards

Marshall Van Alstyne (Questrom), named one of Thinker50's Most Influential Management Thinkers in the World.

Najoung Kim (CAS, Computer Science), awarded Google Cloud Platform (GCP) credits from Google to support work on analyzing multimodal representation.

Orran Krieger (ENG), received the 2023 Excellence in Technology Transfer Award from Federal Laboratory Consortium for Technology Transfer with collaborators.

Cathie Jo Martin (CAS, Political Science), co-winner of the Best Book Award from the APSA European Politics and Society section for her book Education for All?

Emma Lejeune (ENG) selected to the 2024 National Academy of Engineering US Frontiers of Engineering Cohort.

Elaine Nsoesie (SPH), named a Change Agent for Cultivating Inclusive AI by Mozilla.

Alyssa Pierson (ENG), awarded the inaugural Mass-Robotics Rising Star in Robotics Medal .

FACULTY RECOGNITION

Yorghos Tripodis (SPH), received a Fulbright U.S. Scholar Award to pursue statistical methods for dementia and aging in France (2024-25).

Rabia Tugce Yazicigil (ENG), selected to the 2024 National Academy of Engineering US Frontiers of Engineering Cohort.

Hua Wang (ENG), named one of the 2023 Most Influential Asian American Pacific Islanders in Boston.

Xin Zhang (ENG), awarded the 2024 Robert Henry Thurston Lecture Award from the American Society for Mechanical Engineers.

Awards for Distinguished Papers

Margrit Betke (CAS, Computer Science) with CS PhD student Wenda Qin and collaborators received the 2023 IEEE International Joint Conference on Biometrics (IJCB) Best Poster Award for "Age-constrained Ear Recognition: The EICZA Dataset and SASE Baseline Model."

Ayşe Kivilcim Coşkun (ENG), with co-authors, won the IEEE TCAD Donald O. Pederson Best Paper Award for "PACT: An Extensible Parallel Thermal Simulator for Emerging Integration and Cooling Technologies," DOI:10.1109/TCAD.2021.3079166.

Nina Mazar (Questrom) received the 2024 AMA-EBSCO-RRBM Award for Responsible Research in Marketing for the co-authored paper, "Increasing Organ Donor Registrations with Behavioral Interventions: A Field Experiment," Journal of Marketing. 85, no. 3 (2021): 168-183. https://doi.org/10.1177/00222429219900.

Bryan Plummer (CAS, Computer Science) with CS PhD student Zhongping Zhang and collaborators received the 2023 AI for Content Creation Workshop, IEEE Computer Vision and Pattern Recognition Conference Best Paper Runner Up:"Text-to-image Editing by Image Information Removal.

Eran Tromer (CAS, Computer Science) received a Test of Time Award at the IEEE Symposium on Security and Privacy (S&P) 2024 for his co-authored paper "Zerocash: Decentralized Payments from Bitcoin," https://ieeexplore.ieee.org/document/6956581/authors#authors.

Hafsah Shahzad (ENG, PhD Student), Martin Herbordt (ENG), and Red Hat co-authors received the Best Paper Award at the 25th International Symposium on Quality Electronic Design (ISQED) for "AutoAnnotate: Reinforcement Learning based Code Annotation for High Level Synthesis," 1-9, doi: 10.1109/ISQED60706.2024.10528738.

BU and Red Hat won the VLDB 2023 Conference Best Demo award for "On-the-fly Data Transformation in Action;" led by BU Postdoc Ju Hyoung Mun with collaborators, from BU: Renato Mancuso (CAS, Computer Science), Manos Athanassoulis (CAS, Computer Science), Konstantinos Karatsenidis, Tarikul Islam Papon, Shahin Roozkhosh; from Red Hat: Ahmed Sanaullah and Ulrich Drepper; and Denis Hoornaert (Technical University of Munich). https://doi.org/10.14778/3611540.3611593.

University Distinctions

Lucy Hutyra (CAS, Earth & Environment), A&S Distinguished Professor

Andrei Ruckenstein (CAS, Physics), A&S Distinguished Professor

Bobak Nazer (ENG), the 2024 Gerald and Deane Gitner Family Award for Innovation in Teaching with Technology

Priscilla Slanetz, MD (Chobanian & Avedisian SOM), Alpha Omega Alpha, Faculty Membership (lifetime)

Promotions

Full Professor

John Connor (Chobanian & Avedisian SOM)

Catherine Espaillat, (CAS, Astronomy)

Traci Hong (COM)

Stefano Monti (Chobanian & Avedisian SOM)

Associate Professor

Naomi Caselli (Wheelock)

Elizabeth Coppock (CAS, Linguistics)

James Cummings (COM)

Christina L. Dobbs (Wheelock)

Neha Gondal (CAS, Sociology)

Garrett Johnson (Questrom)

Mahesh Karra (Pardee)

Deepak Kumar (Sargent)

Kevin Lane (SPH)

Wenchao Li (ENG)

Renato Mancuso (CAS, Computer Science)

Christoph Nolte (CAS, Earth and Environment)

Mickey Salins (CAS, Mathematics & Statistics)

Lei Tian (ENG)

Shengzhi Zhang (MET, CS)

Clinical Assistant Professor

TJ McKenna (Wheelock)

National Center of Excellence Award

BU was re-designated a Center of Academic Excellence (CAE-R) in Cyber Defense and Research by the National Security Agency and Department of Homeland Security. This effort was led by RISCS affiliates Dean Tanya Zlateva (MET), and Professors Yuting Zhang (MET), Ran Canetti (CAS, CS) and Mayank Varia (CDS).

GRANT HIGHLIGHTS

Young Investigator Awards

Ana Fiszbein (CAS, Biology), NSF Early CAREER Award

Jonathan Huggins (CAS, Mathematics & Statistics), NSF Early CAREER Award

Wenchao Li (ENG), NSF Early CAREER Award

Andrew Sabelhaus (ENG), NSF Early CAREER Award

Rabia Yazicigil (ENG), NSF Early CAREER Award

Renato Mancuso (CAS, Computer Science), ACM SIGBED Early Researcher Career Award

Jonathan Huggins (CAS, Mathematics & Statistics), Blackwell-Rosenbluth Award for outstanding junior Bayseian researchers

Featured Grants

"A Strategic Approach to Building High-Quality, High-Impact Cybersecurity Curriculum for the Nation." Towson University. Awardees: Yuting Zhang and Shengzhi Zhang.

"AI-powered Performance Analytics for Heterogeneous HPC Systems," Sandia National Laboratories. $495,000. PI: Ayşe Coskun (ENG). Co-PI: Brian Kulis (ENG).

"ATD - Anomaly detection and functional data analysis with applications to threat detection for multimodal satellite data," NSF DMS. $250,000. PI: Julio Castrillon (CAS, Mathematics & Statistics). Co-PI: Mark Kon (CAS, Mathematics & Statistics).

"C2H2 RCN GeoCAFE - An RCN to Convene, Accelerate, Foster, and Expand Geosciences Research Addressing Climate Change Impacts on Human Health" National Science Foundation." PI: Gregory Wellenius, (SPH), Co-PIs: Lucy Hutyra (CAS, Earth & Environment) and Dan Li (CAS, Earth & Environment). $500,000.

"Combining AI with Physics-Based Models for the Prediction of Antigen-Antibody and MHC-Peptide Structure and Binding. Merck Research." PI: Diane Joseph-McCarthy (ENG). Co-PIs: Yannis Paschalidis (ENG) and Sandor Vajda (ENG). $200,000.

"Comprehensive assessment of speech physiology and acoustics in Parkinson's disease progression." National Institute of Health. PI: Cara Stepp (Sargent). $691,289.

"EAGER: The Biothreats Emergence, Analysis, and Communications Network (BEACON)." NSF Directorate for Biological Sciences. PI: Nahid Bhadelia (Chobanian & Avedisian SOM). Co-PIs: Yannis Paschalidis (ENG) and John Brownstein, Boston Children's Hospital. $199,979.

"Evaluating the abilities of large language models (LLMs) at performing academic machine learning research." Open Philanthropy. Co-PI: Najoung Kim (CAS, CS, Linguistics). $756,396.

"Extending Reach, Accuracy, and Therapeutic Capabilities: A Soft Robot for Peripheral Early-Stage Lung Cancer." NIH National Institute of Biomedical Imaging and Bioengineering. PI: Sheila Russo (ENG). $297,000.

"Environmental Resources for Individual Cognitive Health/Resilience (EnRICH)." National Institute of Health. PI: Marcia Pescador Jimenez (SPH). $824,386.

"EMERGE: ExaEpi for Elucidating Multiscale Ecosystem Complexities for Robust, Generalized Epidemiology." DOE. PIs: Yannis Paschalidis (ENG), Peter Nugent, Lawrence Berkeley National Lab. Co-PIs: Alexander Olshevsky (ENG) and Helen Jenkins (SPH). $449,943.

"Federated Learning for Predicting Electricity Consumption with Mixed Global/Local Models." NSF. $1.2M. PI: Alex Olshevsky (ENG) and Co-PIs: Venkatesh Saligrama, Michael Caramanis, and Yannis Pascalidis.

"IUCRC Phase I Boston University: Center for Systems Innovation at Scale (i-Scale)," Award Period of Performance: Start Date: 01/01/2024 End Date: 12/31/2028. PI: Orran Krieger. Total Intended Award Amount: $750,000.

"Multilevel stochastic orthogonal subspace transformations for robust machine learning with applications to biomedical data and Alzheimer's disease subtyping," NSFDMS/NIGMS. $600,000. PI: Julio Castrillon. Co-PI: Mark Kon.

"MRA: Using NEON and other network data to anchor a continental multi-scale carbon cycle assimilation and forecast." NSF. PI: Michael Dietze (CAS, Earth & Environment). Co-PI: Jonathan Huggins (CAS, Mathematics & Statistics). DEB-2406258.

"NSF Medium Effortless Data Locality Through Near-memory On-the-fly Data Transformation." NSF. $728,000. PI: Renato Mancuso (CAS, Computer Science), CoPI Manos Athanassoulis (CAS, Computer Science).

"Neuro-Autonomy: Neuroscience-Inspired Perception, Navigation, and Spatial Awareness for Autonomous Robots," Department of Defense and Office of Naval Research. $7.5M. PI: Yannis Paschalidis and Co-PIs: John Baillieul (ENG), Roberto Tron (ENG).

"Towards Mechanistic Audits of LLMs." NSF:DOE National AI Research Resource (NAIRR) Pilot Award. PI: Mark Crovella (CAS, Computer Science). NAIRR240038.

"Visions of Salvation: Chinese Christian Propaganda Posters in an Age of Revolution," J.M. Kaplan Fund's Furthermore (Book) Grant. AwardeeL Daryl Ireland (STH).

Internal Funding

College of Communication Faculty Research Seed Grant.

"Learning information with generative AI: Implications for elaborative processing." Co-PI: James Cummings (COM), $19,835.

Health Data Science Research on Tap Seed Funding Award

"Novel methods to detect spatially varying genes in spatial transcriptomics data sets." PI: Shariq Mohammed (SPH). $5,000.

Ignition Awards by the BU Technology Department

Lou Awad (Sargent)

Hank Fien (Wheelock)

Vijaya Kolachalama (Chobanian & Avedisian SOM)

Red Hat Incubation Awards

Speculative projects

- Jonathan Appavoo (CAS, Computer Science), "Symbiotes: a new step in Linux's evolution"
- Manuel Egele (ENG), "Lock 'n load: deadlock detection in binary-only kernel modules"
- Eshed Ohn-Bar, (ENG), "Minimal mobile systems via cloud-based adaptive task processing"

Small projects

- David Starobinski (ENG), "Improving cybersecurity operations using knowledge graphs"
- Jonathan Appavoo (CAS, Computer Science), "Optimizing kernel paths for performance and energy"
- Martin Herbordt (ENG), "Practical programming of FPGAs with open source tools"
- Vasia Kalavri (CAS, Computer Science), "Towards high performance and energy efficiency in open source stream processing"
- Ajay Joshi (ENG), "CoFHE: compiler for fully homomorphic encryption"
- Martin Herbordt (ENG), "DISL: a dynamic infrastructure services layer for reconfigurable hardware"

GRANT HIGHLIGHTS

- Jonathan Appavoo, (CAS, Computer Science), “Discovering opportunities for optimizing OpenShift energy consumption”
- Manuel Egele (ENG), “HySe: hypervisor security through component-wise fuzzing”
- Eshed Ohn-Bar (CAS), “Co-Ops: collaborative open source and privacy-preserving training for edge and automotive AI”

AI and Education Initiative Faculty Research Grants

“BLAST (Benefits and Limitations of AI in Supporting Teachers of Mathematics),” PI: Leslie Dietiker, Associate Dean for Research (Wheelock)

“First Language-Second Language Proficiency with MultiAutoEIT: An Open Access Measure of Oral Language Proficiency,” PI: Kathy MinHye Kim (Wheelock)

“Giving the Gift of Time: An AI Trained Curriculum Coach for K-12 Teachers,” PI: TJ McKenna (Wheelock)

“Triangulating Translation: An Inquiry into the Use of Generative AI to Bridge Language and Comprehension,” PI: Zachary Rossetti (Wheelock)

Hariri Institute Focused Research Program Awards

“First Trip to Mars: How to Pack Light” FRP. Leaders: Marianna Felici (Center for Space Physics) and Paul Withers (CAS, Astronomy)

“Health Equity in the Wake of Continued Climate Change: Leveraging Big Data to Inform Action” FRP, cosponsored with Institute of Global Sustainability (IGS). Leaders: Gregory Wellenius (SPH) and Lucy Hutyra (CAS, Earth and Environment)

“Novel data science and AI approaches for Brain Health and Brain Disease” FRP, cosponsored with the School of Public Health and the Clinical & Translational Science Institute (CTSI).” Leaders: Swathi Kiran (Sargent), David Boas (ENG), Margrit Betke (CAS, Computer Science), and Prakash Ishwar (ENG).

“Optimal Bio-Inspired Design of Holistic Rehabilitation Systems” FRP. Leaders: Eshed Ohn-Bar (ENG) and Alexander Olshevsky (ENG).

2024 AI and Education Initiative Graduate Student Fellows

Erin Barno, PhD candidate (Wheelock). Advised by Leslie Dietiker (Wheelock)

Erning (Henry) Chen, PhD candidate (Wheelock). Advised by Yasuko Kanno (Wheelock)

Zhongkai Shangguan, PhD candidate (ENG). Advised by Eshed Ohn-Bar (ENG)

Hao Yu, PhD candidate, (CAS, Computer Science). Advised by Margrit Betke (CAS, Computer Science)

Hariri Institute Junior Faculty Fellow Awards

Dillon Brout, (CAS, Astronomy)

Jacob Brown, (CAS, Political Science)

James Chapman, (ENG)

Huimin Cheng, (SPH)

Kimberly Crespo, (Wheelock)

Brian DePasquale, (ENG)

Masao Fukui, (CAS, Economics)

Charlene Ong, (Chobanian & Avedisian SOM)

Hariri Institute Graduate Student Fellow Awards

Fatih Acun, (ENG). Advised by Ayşe Coşkun (ECE, SE)

Sarah Bald, (CDS). Advised by Daniel Segrè (CAS, Biology)

Taylor Beauvais, (CAS, Sociology). Advised by Joan Donovan (COM, Journalism and Emerging Media Studies), Jonathan Mijs (CAS, Sociology), and Neha Gondal (CAS, Sociology)

Xinyi Hu, (CDS)

Masha Lazou, (ENG). Advised by Diane Joseph-McCarthy (ENG) and Sandor Vajda (ENG)

Ryan Senne, (Chobanian & Avedisian SOM). Advised by Brian DePasquale (ENG) and Benjamin Scott (CAS, Psychology & Brain Sciences)

LOOKING AHEAD

During the past year, the Institute made important progress on advancing research convergence and integrated initiatives. The Institute will continue to advance its goal of elevating Boston University's AI, data science and computing research to national prominence, and strengthening its position as the research hub within BU's universe of programs and initiatives that intersect with computing and computational science and engineering.

Our strategic priorities are:

1

Retain and Robustify Institute Focused Research Programs

We will continue to expand the circle of experts and research leaders from whom we obtain feedback regarding proposed programs. Working with BU in DC, we want to make FRPs more predictive than reactive, identifying areas where there are strengths at BU, emerging research leaders, and good prospects for future sponsored projects. We also plan to leverage our newly formed and growing industry advisory board and seek feedback on areas we should be investing that would be of interest to industry.

2

Expanding BU Charles River Campus (CRC) and Medical Campus (BUMC) Collaborations

During the last two FRP cycles we have funded three FRP programs that brought together CRC and BUMC faculty to work on important problems, such as leveraging AI methods in brain disease domains, including Alzheimer's disease, and enhancing AI models that predict breast cancer risk to mitigate possible biases for specific population groups (e.g., black women). These programs have been made possible by collaborating and pooling resources from the Hariri Institute, BU's Clinical and Translational Science Institute, the School of Public Health, and the Evans Center for interdisciplinary biomedical research. There is significant interest for these programs and many exciting initiatives that go beyond what we were able to fund. We will be looking to maintain and expand these efforts that bring closer the medical campus to the rest of the University.

3

Expanding the AI Computing Infrastructure

Advances in AI require significant computational (GPU) resources. For instance, training or even fine-tuning large foundational models requires access to very expensive GPU servers. Acquiring these resources goes beyond what a single faculty lab can afford, no matter how well-funded it is. The model of buying top-of-the-line GPU computing equipment for dedicated use by a single faculty lab is no longer viable. Recognizing this challenge, and through our Red Hat Collaboratory and the Mass Open Cloud Alliance (MOC-A), we invested in greatly expanding GPU capacity at the New England Research Cloud (NERC) run by MOC-A. During the Fall of 2024, we expect that 192 Nvidia H100 GPUs will be available for use at a GPU/hour rate that is a fraction (about ⅓) of rates offered by commercial cloud providers. We will be launching a program to support faculty requests for access to these resources, similar in spirit to the NSF NAIRR program.

4

Strengthen and Expand Hariri Institute Services

The Institute promotes research advances and collaborations through its service function. From SAIL support to PIs, to funding and incubation support to FRPs, grant financial management, and the programs to support Junior Faculty Fellows and Graduate Student Fellows, the Institute is focused on providing goal-oriented services, programs and resources to our community. We will continue to maintain and improve the services that we provide. Areas of focus are providing SAIL engineering support to junior faculty and faculty from non-STEM fields and expanding the capacity of our events and communication teams.

LEADERSHIP

The Hariri Institute for Computing is a federation of centers, labs, and initiatives. Our leadership team consists of the Directors or Co-Directors of each federated area, plus the Institute's Director. Each of these leaders serves on the Institute's Steering Committee in an ex-officio capacity.

IOANNIS PASCHALIDIS

Director, Hariri Institute for Computing and Computational Science & Engineering

NAOMI CASELLI

Director, AI and Education Initiative

MARGRIT BETKE

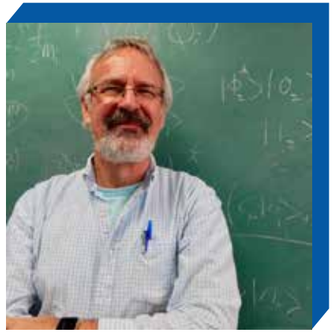
Co-Director, Artificial Intelligence Research (AIR) Initiative

KATE SAENKO

Co-Director, Artificial Intelligence Research (AIR) Initiative

KIM BORMAN

Executive Director, Boston Women's Workforce Council (BWWC)



DAVID COKER

Director, Center for Computational Science

AYSE COSKUN

Director, Center for Information & Systems Engineering (CISE)

RAN CANETTI

Co-Director, Center for Reliable Information Systems & Cyber Security (RISCS)

MAYANK VARIA

Co-Director, Center for Reliable Information Systems & Cyber Security (RISCS)

HUGH BROCK

Co-Director, Red Hat Collaboratory

ORRAN KRIEGER

Co-Director, Red Hat Collaboratory
Director, MOC Alliance

WILLIAM TOMLINSON

Director, Software & Application Innovation Lab (SAIL)

STEERING COMMITTEE

Members of the Institute's Steering Committee are appointed by the Office of Research to assist the Director with overall strategic planning and management of the Institute's operations. Members assist in reviewing ongoing activities, identifying and evaluating opportunities for investment of resources, developing proposals for new programs or initiatives, communicating the Institute's vision, and promoting its goals to the constituents they represent.

Bill Adams

Professor, Pediatrician, BMC,
Director, BU-CTSI

Rhoda Au

Professor, Anatomy, Neurobiology, & Edpidemiology, CAMED

Jennifer Balakrishnan

Professor, Mathematics and Statistics, CAS

Margrit Betke

Professor, Computer Science, CAS,
Faculty of Computing & Data Sciences

Nahid Bhadelia

Associate Professor, CAMED,
Founding Director, CEID

Kim Borman

Executive Director, Boston Women's Workforce Council

Hugh Brock

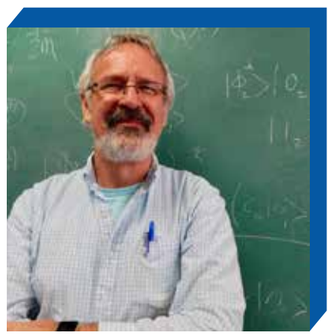
Co-Director, Red Hat Collaboratory

Ran Canetti

Professor, Computer Science, CAS,
Faculty of Computing & Data Sciences

Naomi Caselli

Assistant Professor, Wheelock, Deaf Studies



David Coker

Professor, Chemistry, CAS, Faculty of Computing & Data Sciences

Ayse Coskun

Professor, ECE, SE, ENG,
Director, CISE

Ziba Cranmer

Director, BU SPARK!

Michael Dietze

Professor, Earth and Environment, CAS

Swathi Kiran

Professor, Speech, Language, and Hearing Sciences, SAR, Faculty of Computing & Data Sciences

Orran Krieger

Professor, Electrical & Computer Engineering, ENG

Loretta Lees

Professor, CAS, Sociology; Director of the Initiative on Cities

Cathie Jo Martin

Professor, Political Science, CAS

Elaine Nsoesie

Associate Professor, Global Health, SPH

Ioannis (Yannis) Paschalidis

Distinguished Professor, ENG, ECE, BME, SE, Faculty of Computing & Data Sciences

Emily Ryan

Associate Professor, ME, MSE, ENG, Faculty of Computing & Data Sciences

Kate Saenko

Professor, Computer Science, CAS, Faculty of Computing & Data Sciences Science, CAS

Tracy Schroeder

Vice President, Information Services & Technology

Cara Stepp

Professor, SLHS, Sargent College; Director, Sensorimotor Rehabilitation Engineering Lab

William Tomlinson

Director, SAIL

Mayank Varia

Associate Professor, Faculty of Computing & Data Sciences

Laura White

Professor, Biostatistics, SPH

Wesley Wildman

Professor, Philosophy, Theology, and Ethics, STH, Faculty of Computing & Data Sciences

ADVISORY BOARD

Institute Advisory Board members are appointed by the Director in consultation with the Office of Research for two-year terms to provide feedback and strategic advice to the Director related to the overall mission of the Institute, its positioning within the university, its relationship to various academic units and programs, and its engagements with external organizations. The board reflects a diversity of leadership experiences, spanning academia, industry, government, non-profits, philanthropy, and alumni.

Munther Dahleh

Professor, Electrical Engineering and Computer Science (EECS), MIT

Carolyn A. Kirk

Executive Director of the Massachusetts Technology Collaborative

Cathy Elizabeth Minehan

Co-chair, Boston Women's Workforce; Director, Bright Horizons Family Solutions; Trustee, MITRE Corporation and Brookings Institution

Na (Lina) Li

Professor, Electrical Engineering and Applied Mathematics, Harvard University

INDUSTRY ADVISORY BOARD

Institute Advisory Board members are appointed by the Director in consultation with the Office of Research for one-year terms to provide feedback and strategic advice to the Director related the Institute's pursuit of cutting-edge research opportunities and emerging market trends within industry partners. They guide the Institute's investments in seeding and initiating new research programs at BU and in supporting the Institute's various activities and programs that are meant to nurture the BU computing community, broadly conceived. Membership represents senior leadership from a variety of businesses including healthcare, venture capital, cybersecurity, AI, amongst others.

Paul Cormier

President and CEO,
Red Hat, Inc., Boston

Jianying Hu

IBM Fellow, Director of HCLS Research, Global Science Leader, AI for Healthcare at IBM

Rania Khalaf

Chief Information and Data Officer, Inari

Aneesh Kulkarni

Former Chief Technology Officer, Datavant

Mojgan Lefebvre

Executive Vice President, Chief Technology & Operations Officer, Travelers

Erik Larsen

Senior Vice President, Clinical Development & Customer Success, Sonde Health

Frank Nielsen

Managing Director Quantitative Research at Strategic Advisers, a Fidelity Investments Company

ADMINISTRATIVE TEAMS

The Hariri Institute has assembled a team of talented and dedicated professionals to help researchers make connections, identify additional support resources, and lift the burden of administrative support, so that more research is accomplished with far fewer barriers.

The Institute's administrative staff provide program and project management, grant administration, event planning, communications support, and more.

Hariri Institute

Stephen Brown

Executive Director, Hariri Institute

Katherine D'Angelo

Assistant Director, Programs & Events, Hariri Institute

Daniela Demaestri

Financial Manager, Hariri Institute

Kristen Dionne

Senior Administrative Assistant, Hariri Institute

Emily Johnson

Associate Director, Research Administration, Hariri Institute

Camille Kardoose-Michelini

Grants Manager, Hariri Institute

Kenneth Rudolph

Marketing Communications Specialist, Hariri Institute

Maureen Stanton

Assistant Director, Marketing & Communications, Hariri Institute

ADMINISTRATIVE TEAMS

MOC Alliance

Nancy Clinton

Managing Director, MOC Alliance

Tara Moran

Senior Administrative Coordinator, MOC Alliance

Boston Womens' Workforce Council (BWWC)

Jennifer McDonough

Administrative Manager, Boston Women's Workforce Council

Lauren Noonan

Marketing and Events Manager, Boston Women's Workforce Council

Center for Information & Systems Engineering (CISE)

Christina Polyzos

Associate Director, CISE

Hannah Dallman

Grants Administrator, CISE

Lea Sabra

Marketing Communications Specialist, CISE

SAIL ENGINEERS

SAIL consists of a small team of professional software architects and developers who are assigned to work directly with faculty members (and their research teams) on specific software and application development projects. Additionally, these professional software engineers supervise a team of BU student interns through the SAIL Internship Program. Professional SAIL staff act as the clearing house for software developed by students, thus allowing the research community to leverage the untapped software development capacity of undergraduate and graduate students at BU, while ensuring project continuity.

William Tomlinson

Director, SAIL

Jeff Simeon

Associate Director, Programs & Product Management, SAIL

Greg Frasco

Associate Director of Engineering, SAIL

Hazim Ab Halim

Software Engineer, SAIL

Manny Akosah

Software Engineer, SAIL

Collin Bolles

Software Engineer, SAIL

Zoe Chitty

Software Engineer, SAIL

Karina Hickman

Technical Project Associate, SAIL

Harunobu Ishii

Software Engineer, SAIL

Shashank Karthikeyan

Software Engineer, SAIL

Asad Malik

Software Engineer, SAIL

Arezoo Sadeghi

Senior Software Engineer, SAIL

Wenhan Wang

Software Engineer, SAIL

MOC ALLIANCE ENGINEERING TEAM

Michael Daitzman

Director of Engineering
and Product

Joachim Weyl

Technical Project Manager

Naved Ansari

Senior Software Engineer

Lars Kellogg-Stedman

Senior Principal
Software Developer

Kristi Nikolla

Senior Software Engineer

Quan Pham

Software Engineer

Hakan Saplakoglu

Software Engineer

POSTDOCS

Postdoctoral Research Associates have recently earned a PhD from Boston University or other institutions. They are currently collaborating with faculty researchers and other PhD students on projects at the Hariri Institute.

Venkitesh Ayyar, Postdoctoral Associate (Center for Computational Science), Boston University

Dina Bashkirova, Postdoctoral Associate (Image and Video Computing Group), Boston University

Seyed Mohammad Hadi Daneshmand, Postdoctoral Associate (Foundation of Data Science Institute), Boston University, and MIT

Han Dong, Postdoctoral Associate (Red Hat Research), Boston University

Cody Freitag, Postdoctoral Associate (Khoury College Distinguished Postdoctoral Fellowship), Boston University and Northeastern University

Alexander Hino, Postdoctoral Associate, Boston University

Nobuyuki Matsumoto, Postdoctoral Associate, Boston University

Marcel Neunhoeffer, Postdoctoral Associate (Center for Reliable Information Systems and Cyber Security), Boston University and Ludwig Maximilian University of Munich

Thomas Unger, Postdoctoral Associate, Boston University

VISITING SCHOLARS

Visiting Scholars are scholars from other institutions spending time at the Hariri Institute in collaborative research endeavors.

Maryam Aliakbarpour, Visiting Researcher (Center for Reliable Information Systems and Cyber Security), Michael B. Yuen and Sandra A. Tsai Assistant Professor, Rice University

Seyed Mohammad Hadi Daneshmand, Visiting Researcher (Foundation of Data Science Institute), Boston University, and MIT

Heidi Dempsey, Visiting Researcher (Red Hat Collaboratory), Research and Innovation Director, Red Hat

Peter Desnoyers, Visiting Researcher (MOC Alliance), Associate Professor, Khoury College of Computer Sciences, Northeastern University

Lars Kellodd-Stedman, Visiting Researcher (MOC Alliance), Senior Principal Software Engineer, Red Hat

Abhishek Pratap, Visiting Researcher (Hariri Institute), Head, Data Innovation & Intuition Study Biogen Digital Health, Biogen, Boston

Larry Rudolph, Visiting Researcher (MOC Alliance), Principle Research Scientist, Computer Science and Artificial Intelligence Laboratory, MIT

Ata Turk, Visiting Researcher (MOC Alliance), Research Scientist, Red Hat

Larry Woodman, Visiting Researcher (MOC Alliance), Senior Distinguished Engineer, Red Hat

JUNIOR FACULTY FELLOWS

Kayhan Batmanghelich (2023), Assistant Professor, ENG, Electrical & Computer Engineering

Dillon Brout (2024), Assistant Professor, CAS, Astronomy

Jacob Brown (2024), Assistant Professor, CAS, Political Science

James Chapman (2024), Assistant Professor, ENG, Mechanical Engineering

Huimin Cheng (2024), Assistant Professor, SPH, Biostatistics

Kimberly Crespo (2024), Assistant Professor, Sargent, Department of Speech, Language, & Hearing Sciences

Brian DePasquale (2024), Assistant Professor, ENG, Biomedical Engineering

Ana Fiszbein (2021), Assistant Professor, CAS, Biology

Masao Fukui (2024), Assistant Professor, CAS, Economics

Scott Hirst (2021), Associate Professor, LAW, Law

Jonathan Jay (2022), Assistant Professor, SPH, Community Health Science

Jihye Jeon (2021), Assistant Professor, CAS, Economics

Garrett Johnson (2021), Assistant Professor, Questrom, Marketing

Laura Lewis (2021), Assistant Professor, ENG, Biomedical Engineering

Tesary Lin (2022), Assistant Professor, Questrom, Marketing

Yuhei Miyauchi (2022), Assistant Professor, CAS, Economics

Shariq Mohammed (2022), Assistant Professor, SPH, Biostatistics

Eshed Ohn-Bar (2023), Assistant Professor, ENG, Electrical & Computer Engineering

Charlene Ong (2024), Assistant Professor, Chobanian & Avedisian SOM, Neurology

Prasad Patil (2021), Assistant Professor, SPH, Biostatistics

Bryan Plummer (2023), Assistant Professor, CAS, Computer Science

Max Reppen (2022), Assistant Professor, Questrom, Finance

Xiaozhou Ruan (2023), Assistant Professor, CAS, Earth & Environment

Chris Chao Su (2023), Assistant Professor, COM, Emerging Media Studies

Preeti Sunderaraman (2023), Assistant Professor, Chobanian & Avedisian SOM, Neurology

Adriana Tomic (2023), Assistant Professor, ENG, Biomedical Engineering and Virology, Immunology & Microbiology

Jinglong Zhao (2022), Assistant Professor, Questrom, Operations & Technology Mgt

GRADUATE STUDENT FELLOWS

Fatih Acun (2024), PhD Student, ENG, Electrical & Computer Engineering

Afra Feyza Akyurek (2021), PhD Student, CAS, Computer Science

Courtney Aul (2023), PhD Student, CAS, Psychological and Brain Sciences

Sarah Bald (2024), PhD Student, CDS, Bioinformatics

Taylor Beauvais (2024), PhD Student, CAS, Sociology

Daria Dragicevic (2022), PhD Student, Sargent, Speech, Language & Hearing Sciences

Anqi Guo (2022), PhD Student, ENG, Electrical & Computer Engineering

Munib Hasnain (2021), PhD Student, ENG, Biomedical Engineering

Xinyi Hu (2024), PhD, Student, CDS, Computing & Data Sciences

Hiba Kobeissi (2022), PhD Student, ENG, Mechanical Engineering

Masha Lazou (2024), PhD Student, ENG, Biomedical Engineering

Chen Ling (2021), PhD Student, ENG, Computer Engineering

Devlin Moyer (2021), PhD Student, CDS, Bioinformatics

Chika Onubogu (2022), PhD Student, CAS, Astronomy

Margaret (Greta) Rauch (2023), PhD Student, CAS, History

Edward Ruiz (2023), PhD Student, Chobanian & Avedisian SOM, Medicine, Hematology/Oncology

Adam Samuels (2021), PhD Student, CAS, Astronomy

Ryan Senne (2024), PhD Student, Chobanian & Avedisian SOM, Neuroscience

Michael Silverstein (2022), PhD Student, CDS, Bioinformatics

Adrianna Spindle-Jackson (2021), PhD Student, SSW, Social Work

Jack Vincent (2023), PhD Student, ENG, Biomedical Engineering

Connor Wagaman (2023), PhD Student, CAS, Computer Science

Hao Wang (2021), PhD Student, ENG, Electrical & Computer Engineering

Jianing Wang (2021), PhD Student, CDS, Biostatistics

Olivia Wyatt (2022), PhD Student, Wheelock, Counseling Psychology & Applied Human Development

Lingyi Xu (2022), PhD Student, CDS, Computing & Data Sciences

Yixin (Amy) Zhang (2023), PhD Student, CAS, Biostatistics

Zeying Zhu (2023), PhD Student, ENG, Electrical & Computer Engineering

RESEARCH FELLOWS

Novel data science and AI approaches for Brain Health and Brain Disease

Rhoda Au, Professor, Anatomy & Neurobiology, Chobanian & Avedisian SOM

Lou Awad, Associate Professor, Physical Therapy, SAR

Margrit Betke, Professor, Associate Chair of the Faculty, Computer Science, CAS

David Boas, Distinguished Professor, Director of Neurophotonics Center, Biomedical Engineering, and Electrical & Computer Engineering, ENG

Andrew Budson, Professor, Neurology, Chobanian & Avedisian SOM

Theresa Ellis, Associate Professor, Physical Therapy, SAR

Mike Esterman, Associate Professor, Psychiatry, Chobanian & Avedisian SOM

Alice Cronin Golomb, Professor & Director, Psychological and Brain Sciences, CAS

Prakash Ishwar, Professor, Electrical and Computer Engineering, ENG

Vijaya Kolachalama, Associate Professor, Computational Biomedicine, Chobanian & Avedisian SOM

Swathi Kiran, Professor, Neurorehabilitation, SAR

Janusz Konrad, Professor, Electrical & Computer Engineering, ENG

Shariq Mohammed, Assistant Professor, Biostatistics, SPH

Eshed Ohn-Bar, Assistant Professor, Electrical and Computer Engineering, ENG

Ioannis (Yannis) Paschalidis, Distinguished Professor, ENG, ECE, BME, SE; Director, Rafik B. Hariri Institute for Computing and Computational Science and Engineering

Bryan Plummer, Assistant Professor, Computer Science, CAS

Jose Rafael Romero, Associate Professor, Chobanian & Avedisian SOM, Neurology, Neurology, Chobanian & Avedisian SOM

Rob Reinhart, Associate Professor, Psychological and Brain Sciences, CAS

David Somers, Professor, Psychological and Brain Sciences, CAS

Cara Stepp, Professor & Director, Speech, Language and Hearing Sciences, STEPP LAB, SAR

Chantal Stern, Professor & Chair, Psychological and Brain Sciences, Cognitive Neuroimaging Laboratory, CAS

Yorghos Tripodis, Professor, Biostatistics, SPH

Archana Venkataraman, Associate Professor, Electrical and Computer Engineering, ENG

Derry Wijaya, Assistant Professor, Computer Science, CAS

Meryem Yucel, Research Associate Professor, Biomedical Engineering, ENG

First trip to Mars: How to Pack Light

Jennifer Bhatnagar, Associate Professor, Biology, CAS

Marianna Felici, Research Scientist, Center for Space Physics, CAS

Prakash Ishwar, Professor, Electrical & Computer Engineering, ENG

Jeffrey Marlow, Assistant Professor, Biology, CAS

Majd Mayyasi, Senior Research Scientist, Center for Space Physics

Pankaj Metha, Professor, Physics, CAS

Daniel Segrè, Professor, Biology, CAS

Joshua Semeter, Professor, Electrical and Computer Engineering, ENG

Paul Withers, Professor, Department Chair, Astronomy, CAS

RESEARCH FELLOWS

Health Equity in the Wake of Continued Climate Change

Jonathan Buonocore, Assistant Professor, Environmental Health, SPH

Stephanie A Ettinger de Cuba, Research Assistant Professor, Health, Law, Policy, & Management, SPH

Patricia Fabian, Associate Professor, Environmental Health, SPH

Mark Friedl, Professor, Earth & Environment, CAS; Director, Center for Remote Sensing

Emma Gause, Research Scientist, Environmental Health, SPH

Lucy Hutyra, Distinguished Professor, Earth & Environment, CAS

Marcia Jimenez, Assistant Professor, Epidemiology, SPH

Muskaan Khemani, Research Assistant, Environmental Health, SPH

Patrick Kinney, Professor, Environmental Health, SPH

Kevin Lane, Assistant Professor, Environmental Health, SPH

Chad Milando, Research Scientist, Environmental Health, SPH

Amruta Nori-Sarma, Assistant Professor, Environmental Health, SPH

Madeleine Scammel, Associate Professor, Environmental Health, SPH

Ian Smith, PhD, Earth & Environment, CAS

Keith Spangler, Research Scientist, Environmental Health, SPH

Ian Sue Wing, Professor, Earth & Environment, CAS

Koen Tieskens, Postdoctoral Associate, Environmental Health, SPH

Gregory Wellenius, Professor, Environmental Health, SPH

Optimal Bio-Inspired Design of Holistic Rehabilitation Systems

Lou Awad, Associate Professor, Physical Therapy, SAR

Calin Belta, Professor & Director, Mechanical Engineering, BU Robotics Lab, ENG

Alice Cronin-Golomb, Professor & Director, Psychological and Brain Sciences, CAS

Terry Ellis, Associate Professor, Physical Therapy, SAR

Elliot Lee Saltzman, Associate Professor, Physical Therapy, SAR

Wenchao Li, Assistant Professor, Electrical and Computer Engineering, ENG

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Alexander Olshevsky, Assistant Professor, Electrical & Computer Engineering, ENG

Alyssa Pierson, Assistant Professor, Mechanical Engineering, ENG

Andrew Sabelhaus, Assistant Professor, Mechanical Engineering, ENG

SELECTED HONORS OF HARIRI AFFILIATES

Manos Athanassoulis (CAS, Computer Science), Associate Editor, PVLDB Vol 18, Associate Editor, ACM SIGMOD Record

Lou Awad (Sargent), Associate Editor, IEEE Open Journal of Engineering, Medicine and Biology; Associate Editor for the Journal of Neuroengineering and Rehabilitation; Standing Member of the Musculoskeletal Rehabilitation Sciences NIH Study Section

Naomi Caselli (Wheelock), Editorial Board, Journal of Deaf Studies and Deaf Education and Applied Psycholinguistics

Christos Cassandras (ENG), Chair, IFAC Fellow Section Committee (2020 - 2023)

Ran Canetti (CAS, Computer Science), Associate Editor, Journal of Cryptology and Information and Computation

Swathi Kiran (Sargent), Editor, AJSLP Clinical Aphasiology Conference Special Issue

Janusz Konrad (ENG), Deputy Editor-in-Chief, IEEE Transactions on Image Processing

J. Gregory McDaniel (ENG), Associate Editor, JASA Express Letters

Priscilla Slanetz (Chobanian & Avedisian SOM), Chair of Commission, Publications and Lifelong Learning (CoPLL) for the American College of Radiology, Member on the Board of Chancellors, American College of Radiology, Board of Radiology Advocacy Network

Laura White (SPH), Oversight Committee Member, New England Statistical Society Council (NESS)

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Gary Benson, Associate Professor, College of Arts & Sciences, Departments of Biology, Computer Science

Kimberly Bertrand, Associate Professor, Chobanian & Avedisian School of Medicine, Department of Preventive Medicine

Azer Bestavros, William Fairfield Warren Distinguished Professorship; Professor, Department of Computer Science; Associate Provost, Faculty of Computing & Data Sciences

Margrit Betke, Professor, College of Arts & Sciences, Department of Computer Science; Associate Chair of the Faculty Department of Computer Science; Co-Director, Artificial Intelligence Research

Nahid Bhadelia, Founding Director Center on Emerging Infectious Diseases; Infectious Diseases Physician; Associate Professor, Chobanian & Avedisian School of Medicine

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David Bishop, Professor, College of Engineering, Departments of Electrical & Computer Engineering, Mechanical Engineering, Biomedical Engineering, College of Arts & Sciences, Department of Physics; Head, Division of Materials Science & Engineering; Director, CELL-MET Engineering Research Center

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Tereasa Brainerd, Professor, College of Arts & Sciences, Department of Astronomy

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Timothy Brown, Professor, College of Arts & Sciences, Department of Psychological & Brain Sciences; Director of Research & Research Administration, Center for Anxiety & Related Disorders

Andrew Budson, Professor, Chobanian & Avedisian School of Medicine, Department of Neurology; Associate Director and Outreach, Recruitment, and Engagement Core Leader, Boston University Alzheimer's Disease Research Center; Lecturer, Department of Neurology, Harvard Medical School; Chief of Cognitive & Behavioral Neurology, Associate Chief of Staff for Education and Director, Translational Cognitive Neuroscience, Veterans Affairs Boston Healthcare System;

Mark Bun, Assistant Professor, College of Arts & Sciences, Department of Computer Science

Jonathan Buonocore, Assistant Professor, School of Public Health, Department of Environmental Health

John Byers, Professor, College of Arts & Sciences, Department of Computer Science; Senior Associate Dean of the Faculty Division of Mathematical & Computational Sciences

Thomas Byrne, Associate Professor & Charles River Campus Advisor, School of Social Work, Department of Social Welfare Policy

Michael Caramanis, Professor, College of Engineering, Department of Mechanical Engineering, Division of Systems Engineering

Catherine Caldwell-Harris, Associate Professor, College of Arts & Sciences, Department of Psychology

David Campbell, Professor, College of Arts & Sciences, Department of Physics, College of Engineering, Department of Electrical & Computer Engineering, Division of Materials Science & Engineering

Joshua Campbell, Assistant Professor, Chobanian & Avedisian School of Medicine, Department of Computational Biomedicine

Ran Canetti, Professor, College of Arts & Sciences, Department of Computer Science; Director, Center for Reliable Information System and Cyber Security

Paul Carlile, Professor, Questrom School of Business, Department of Information Systems; Senior Associate Dean, Online Learning

Luis Carvalho, Associate Professor, College of Arts & Sciences, Department of Mathematics & Statistics; Director, MS in Statistical Practice

Naomi Caselli, Assistant Professor, Wheelock College of Education & Human Development Department of Deaf Studies; Director, AI & Education Initiative

Christos Cassandras, Distinguished Professor, College of Engineering, Department of Electrical & Computer Engineering; Head, Division of Systems Engineering

David Castañón, Professor, College of Engineering, Department of Electrical & Computer Engineering, Division of Systems Engineering

HARIRI RESEARCH AFFILIATES

Claudio Chamon, Professor, College of Arts & Sciences, Department of Physics, College of Engineering, Division of Materials Science & Engineering

Anushya Chandran, Associate Professor, College of Arts & Sciences, Department of Physics

James Chapman, Assistant Professor, College of Engineering, Department of Mechanical Engineering

Tanima Chatterjee, Clinical Assistant Professor of Computing & Data Sciences; Director of Undergraduate Studies, Faculty of Computing and Data Science

Christine Cheng, Adjunct Assistant Professor, College of Arts & Sciences, Department of Biology

Debbie Cheng, Professor, School of Public Health, Department of Biostatistics

Olivia Chi, Assistant Professor, Wheelock College of Education & Human Development, Educational Leadership & Policy Studies

Peter Chin, Adjunct Professor, College of Arts & Sciences, Department of Computer Science

Vipul Chitalia, Associate Professor, Chobanian & Avedisian School of Medicine, Department of Medicine

Lou Chitkushev, Senior Associate Dean for Academic Affairs, Associate Professor, Metropolitan College, Department of Computer Science; Director, Health Informatics & Health Sciences

Brian Cleary, Assistant Professor, College of Engineering, Department of Biomedical Engineering

David Coker, Professor, College of Arts & Sciences, Department of Chemistry, College of Engineering, Division of Materials Science & Engineering

John Connor, Associate Professor, Chobanian & Avedisian School of Medicine, Department of Virology, Immunology, & Microbiology

Ronald Corley, Emeritus Professor, Chobanian & Avedisian School of Medicine, Department of Virology, Immunology, & Microbiology

Canan Gunes Corlu, Associate Professor, Metropolitan College, Department of Administrative Sciences; Coordinator, Supply Chain Management; Codirector, Decision Sciences Research Laboratory BU

Ayşe Kivilcim Coşkun, Interim Associate Dean for Research & Faculty Development, Professor, College of Engineering, Department of Electrical & Computer Engineering; Director, Center for Information & Systems Engineering

Ziba Cranmer, Director, SPARK!

Felicity Crawford, Clinical Associate Professor, Wheelock College of Education & Human Development, Department of Special Education

Kimberly Crespo, Assistant Professor, Wheelock College of Education & Human Development, Department of Speech, Language, and Hearing Sciences

Nicholas Crossland, Assistant Professor, Chobanian & Avedisian School of Medicine Department of Pathology & Laboratory Medicine

Mark Crovella, Professor, College of Arts & Sciences, Department of Computer Science; Professor & Chair of Academic Affairs, Faculty of Computing & Data Sciences

Qiang Cui, Professor, College of Arts & Sciences, Department of Chemistry

Ashok Cutkosky, Assistant Professor, College of Engineering, Department of Electrical & Computer Engineering, Division of Systems Engineering

Julie Dahlstrom, Clinical Associate Professor, School of Law, Department of Law; Associate Dean, Experiential Education

Nermeen Dashoush, Clinical Assistant Professor, Wheelock College of Education & Human Development, Department of Early Childhood Education

Joanna Davidson, Associate Professor, College of Arts & Sciences, Department of Anthropology; Associate Director, Kilachand Honors College

Gerald Denis, Shipley Prostate Cancer Research Professor, Chobanian & Avedisian School of Medicine, Department of Medicine

Douglas Densmore, Professor, College of Engineering, Departments of Electrical & Computer Engineering, Biomedical Engineering, Division of Materials Science & Engineering

Peter Desnoyers, Associate Professor, Computer Science, Northeastern University

Anita Destefano, Professor, School of Public Health, Department of Biostatistics

Jerome Detemple, Morton H. And Charlotte Friedman Professor In Finance, Questrom School of Business, Department of Finance

Anand Devaiah, Professor, Chobanian & Avedisian School of Medicine, Department of Otolaryngology

Leslie Dietiker, Associate Professor, Wheelock College of Education & Human Development Department of Mathematics Education; Associate Dean, Research

Michael Dietze, Professor, College of Arts & Sciences, Department of Earth & Environment

Christina Dobbs, Associate Professor, Wheelock College of Education & Human Development Department of English Education, Program Director

Linda Doerrer, Professor, College of Arts & Sciences, Department of Chemistry, College of Engineering, Division of Materials Science & Engineering; Associate Director, Kilachand Honors College

Stacey Dogan, Professor, School of Law, Department of Law

Chuanfei Dong, Assistant Professor, College of Arts & Sciences, Department of Astronomy

Iddo Drori, Associate Professor of the Practice, College of Arts & Sciences, Department of Computer Science; Director of Masters Admissions, Masters in Artificial Intelligence

Chuanhua Duan, Associate Professor, College of Engineering, Mechanical Engineering

Mary Dunlop, Associate Professor, College of Engineering, Department of Biomedical Engineering; Graduate Chair, Department of Biomedical Engineering

Tugba Efendigil, Clinical Associate Professor, Questrom School of Business, Department of Operations and Technology Management

Manuel Egele, Associate Professor, College of Engineering, Department of Electrical & Computer Engineering

Katherine Einstein, Associate Professor, College of Arts & Sciences, Department of Political Science

Theresa Ellis, Professor & Chair, Sargent College of Health & Rehabilitation Sciences, Department of Physical Therapy; Director, Center for Neurorehabilitation

Andrew Emili, Adjunct Professor, College of Arts & Sciences, Department of Biology & Department of Biochemistry

Alina Ene, Associate Professor & Associate Chair of Academics, College of Arts & Sciences, Department of Computer Science

Dora Erdos, Senior Lecturer & Director of Undergraduate Studies, College of Arts & Sciences, Department of Computer Science

Catherine Espaillat, Director of Undergraduate Studies, Associate Professor, College of Arts & Sciences, Department of Astronomy; Director, Institute for Astrophysical Research BU

Mike Esterman, Associate Professor, Chobanian & Avedisian School of Medicine, Department of Psychiatry

HARIRI RESEARCH AFFILIATES

Stephanie Ettinger de Cuba, Research Assistant Professor, School of Public Health, Department of Health, Law, Policy, & Management

M. Patricia Fabian, Associate Professor, School of Public Health, Department of Environmental Health

Sergio Fagherazzi, Professor, College of Arts & Sciences, Earth & Environment

Lindsay Farrer, Distinguished Professor, Chobanian & Avedisian School of Medicine, Department of Medicine

Chad Farris, Assistant Professor, Chobanian & Avedisian School of Medicine, Department of Medicine, Radiology

James Feigenbaum, Assistant Professor, College of Arts & Sciences, Department of Economics

Marianna Felici, Research Scientist, College of Arts & Sciences, Center for Space Physics

Hank Fien, Nancy H. Roberts Professor of Educational Innovation, Wheelock College of Education & Human Development, Department of Teaching & Learning; Director, Wheelock College of Education & Human Development Institute for the Science of Education; Director, National Center on Improving Literacy

Ana Fiszbein, Assistant Professor, College of Arts & Sciences, Department of Biology

Martin Fiszbein, Assistant Professor, College of Arts & Sciences, Department of Economics

Andrew Fitzpatrick, Associate Professor, College of Arts & Sciences, Department of Physics

Juliet Floyd, Borden Parker Bowne Professor, College of Arts & Sciences, Department of Philosophy; Director, Center for the Humanities

Elena Forzani, Assistant Professor, Wheelock College of Education & Human Development, Department of Literacy Education

Andrey Fradkin, Dean's Research Scholar, Assistant Professor, Questrom School of Business, Department of Marketing

Greg Frasco, Associate Director of Engineering, Software & Application Innovation Lab

Sarah Frederick, Director of Undergraduate Studies, Associate Professor, College of Arts & Sciences, Department of World Languages & Literatures

Mark Friedl, William Goodwin Aurelio Professor of Mathematics & Statistics, Professor, College of Arts & Sciences, (Earth & Environment; Director, Center for Remote Sensing

Masao Fukui, Assistant Professor, College of Arts & Sciences, Department of Economics

Daniel Fulford, Associate Professor, Sargent College of Health & Rehabilitation Sciences, Department of Occupational Therapy

Marco Gaboardi, Director of Graduate Studies, Associate Professor, College of Arts & Sciences, Department of Computer Science

Peter Gacs, Professor Emeritus, College of Arts & Sciences, Department of Computer Science

Kevin Gallagher, Professor, Frederick S. Pardee School of Global Studies, Department of Global Development Policy; Director, Global Development Policy Center

Emma Gause, Research Scientist, School of Public Health, Department of Environmental Health

Michael Gevelber, Associate Professor, College of Engineering, Department of Mechanical Engineering, Divisions of Materials Science & Engineering, Systems Engineering

Amir Emad Ghassami, Assistant Professor, College of Arts & Sciences, Mathematics & Statistics

Roscoe Giles, Professor, College of Engineering, Department of Electrical & Computer Engineering

Simone Gill, Associate Professor, Sargent College of Health & Rehabilitation Sciences, Department of Occupational Therapy

Kira Goldner, Assistant Professor, College of Arts & Sciences, Department of Computer Science, Faculty of Computing & Data Sciences

Sharon Goldberg, Associate Professor, College of Arts & Sciences, Department of Computer Science

Alice Cronin-Golomb, Professor, College of Arts & Sciences, Department of Psychological & Brain Sciences; Director, Vision & Cognition Laboratory

Joshua Goodman, Associate Professor, Wheelock College of Education & Human Development, Department of Educational Leadership & Policy Studies; Program Director of Doctoral Studies

Sucharita Gopal, Professor, College of Arts & Sciences, Department of Earth & Environment

Vivek Goyal, Professor & Associate Chair of Doctoral Programs, College of Engineering, Department of Electrical & Computer Engineering

Sheryl Grace, Associate Professor, College of Engineering, Department of Mechanical Engineering

Jennifer Green, Professor, Wheelock College of Education & Human Development, Department of Special Education

Jonathan Greenacre, Assistant Professor, Frederick S. Pardee School of Global Studies, Department of Global Development Policy

Stephen Grossberg, Wang Professor of Cognitive and Neural Systems; Professor Emeritus, College of Engineering, Departments of Mathematics & Statistics, Psychological & Brain Sciences

Bin Gu, Everett W. Lord Distinguished Faculty Scholar; Professor & Department Chair, Questrom School of Business Department of Information Systems

Adam Guren, Associate Professor, College of Arts & Sciences, Department of Economics

Olga Gursky, Professor, Chobanian & Avedisian School of Medicine, Department of Pharmacology, Physiology, & Biophysics

Leyla Han, Assistant Professor, Questrom School of Business, Department of Finance

Joel Henderson, Associate Professor, Chobanian & Avedisian School of Medicine, Department of Pathology & Laboratory Medicine

Martin Herbordt, Professor, College of Engineering, Department of Electrical & Computer Engineering

Scott Hirst, Associate Professor, School of Law, Department of Law

Anna Hohler, Associate Professor, Chobanian & Avedisian School of Medicine, Department of Neurology

Douglas Holmes, Associate Professor, College of Engineering, Departments of Mechanical Engineering, Division of Materials Science & Engineering

Steve Homer, Professor, College of Arts & Sciences, Department of Computer Science

Traci Hong, Associate Professor, College of Communication, Department of Mass Communication, Advertising, & Public Relations

Marc Howard, Professor, College of Arts & Sciences, Psychology & Brain Sciences; Program Director, Brain, Behavior, and Cognition; Director, Theoretical Cognitive Neuroscience Lab

Dean Howarth, Postdoctoral Associate, CCS

Jonathan Huggins, Assistant Professor, College of Arts & Sciences, Mathematics & Statistics

Lucy Hutyra, Distinguished Professor, College of Arts & Sciences, Earth & Environment

Daryl Ireland, Research Associate Professor, School of Theology, Department of Mission; Associate Director, Center for Global Christianity & Mission

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Harunobu Ishii, Software Engineer, SAIL

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Marcia Jimenez, Assistant Professor, School of Public Health, Department of Epidemiology

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Keynotes

"How to Model Vibration Damping in Complex Materials and Structures," J. Gregory McDaniel, Presented at the Joint Meeting 186th Meeting of the Acoustical Society of America/Acoustics Week, Ottawa, Ontario, Canada, May 13th–17th, 2024.

"Building Robust Data Systems", Manos Athanassoulis (CAS, Computer Science). Presented at Applied AI for Database Systems and Applications at VLDB 2023, Vancouver, BC, Canada, Aug 28th to Sept. 1st, 2023

"AI for Computer System Analytics," Ayşe Coskun (ENG). Presented at the 34th IEEE International Conference on Application-specific Systems, Architectures and Processors (ASAP), Porto, Portugal, July 19th-21st, 2023.

Presentations

"Unexpected Results from Structural Acoustic Optimizations," J. Gregory McDaniel (ENG), Presented at the Joint Meeting 186th Meeting of the Acoustical Society of America/Acoustics Week in Canada Sponsored by the Acoustical Society of America and the Canadian Acoustical Association, May 16th, 2024.

"Eric Ungar and Vibration Damping," J. Gregory McDaniel (ENG), Presented at the Joint Meeting 186th Meeting of the Acoustical Society of America/Acoustics Week in Canada Sponsored by the Acoustical Society of America and the Canadian Acoustical Association.

"SH43D-3193 The Resilience of the "Croissant" Heliosphere Under Solar-Cycle Varying Conditions" Chika Onubogu (CAS, Astronomy). Presented at the American Geophysical Union 2023 conference meeting.

"Storage Research in an Open Cloud," Orran Krieger (ENG). Presented at the 15th ACM Workshop on Hot Topics in Storage and File Systems, Hot Storage 2023.

"Enabling Contextual Soft Moderation on Social Media through Contrastive Textual Deviation" Gianluca Stringhini (ENG). Will be presented at the 2024 USENIX Security Symposium.

"Demographic Decibels: how large language models reproduce social stratification using data volume," Taylor Beauvais (CDS). Will be presented at the 2024 American Sociological Association panel on Artificial Intelligence.

Yannis Paschalidis (ENG) was an invited speaker at the National Academies Workshop on Alzheimer's Disease and Related Dementias on January 17th, 2024.

Books

Cathie Jo Martin. Education for All? Authors, Culture and Education Development in Britain and Denmark, Cambridge University Press 2023. https://doi.org/10.1017/9781009419673

Vijay Kanabar and Jason Wong. AI Revolution in Project Management. Pearson, 2024. ISBN-13: 9780138297336 | Published 2023

Daryl Ireland. Visions of Salvation: Chinese Christian Propaganda Posters in an Age of Revolution. Editor. Waco, TX: Baylor University Press, 2023. https://www.baylorpress.com/9781481316248/visions-of-salvation/

1. A. Devaiah, H.C. Lee, S. Russo, U. Upahhyay, D. Van Lewen, and, C. Wang, "Capacitive Origami Sensing Modules for Measuring Force in a Neurosurgical, Soft Robotic Retractor", in the 2024 International Conference on Robotics and Automation (ICRA 2024).

2. Abrahamson, D., Adjapong, E., Albert, L., Alexander, N., Amador, J., Ambrose, R., Dietiker, L., ... & Hiebert, J. (2023). Reviewers for the Journal for Research in Mathematics Education in 2022. Journal for Research in Mathematics Education, 54(5), 351-352.

3. Abramovich, S., Abrams, S., Adair, J., Adams, A., Adams, E., Affolter, T., ... & Bacher-Hicks, A. (2023). The editors of Educational Evaluation and Policy Analysis would like to thank the following people for reviewing manuscripts from October 18, 2022, through October 25, 2023. Educational Evaluation and Policy Analysis, 45(4), 696-701.

4. Adesiji AD, Brown KA, Gongora A, Lawton TJ, Morgan EF, Silverman S, Snapp KL, Verdier B, Whiting E,. Superlative mechanical energy absorbing efficiency discovered through self-driving lab-human partnership. Nature Communications, 2024; 15(1):4290.

5. Adler CH, Alosco ML, Au R, Balcer LJ, Banks SJ,Barr WB, Bernick C, Chen K, Coleman MJ, Cummings JL, Daneshvar DH, Dodick DW, Johnson K, Katz DI, Luo J, Marek KL, Mez J, McClean MD, McKee AC,Palmisano JN, Peskind ER, Protas H, Rabinovici G, Reiman EM, Shenton ME, Stern RA,Su Y, Tripodis Y, Turner RW 2nd, Wethe JV; DIAGNOSE CTE Research Project Investigators. Flortaucipir tau PET findings from former professional and college American football players in the DIAGNOSE CTE research project. Alzheimers Dement. 2023 Dec 22. doi: 10.1002/alz.13602. Epub ahead of print. PMID: 38134231.

6. Adler CH, Alosco ML, Au R,Balcer LJ, Banks SJ, Barr WB,Bernick C, Blennow K, Bondi MW, Bouix S, Cantu RC, Coleman MJ,Cummings JL, Delano-Wood LM, Dodick DW, Hartlage K, Koerte IK, Lin AP, Ly MT, Martin B, McClean MD, Mez JB, Palmisano J, Peskind ER, Reiman EM, Shenton ME,Stern RA, Tripodis Y,Tuz-Zahra F, Wethe JV, Zetterberg H; for DIAGNOSE CTE Research Project. Association of Vascular Risk Factors and CSF and Imaging Biomarkers With White Matter Hyperintensities in Former American Football Players. Neurology. 2024 Jan 23;102(2):e208030. doi: 10.1212/WNL.0000000000208030. Epub 2023 Dec 20. PMID: 38165330.

7. Adler CH, Alosco ML,Balcer LJ, Baucom Z, Bernick C, Cummings JL, Johnson KA, Marek KL, McClean MD, McKee AC, Mez J, Palmisano JN, Pulukuri SV, Reiman EM, Shenton ME, Stein TD, Stern RA, Tripodis Y, Trujillo-Rodriguez D; DIAGNOSE CTE Research Project Investigators. Amyloid PET across the cognitive spectrum in former professional and college American football players: findings from the DIAGNOSE CTE Research Project. Alzheimers Res Ther. 2023 Oct 5;15(1):166. doi: 10.1186/s13195-023-01315-5. PMID: 37798671; PMCID: PMC10552261.

8. Ahangaran M, Au R, Chaudhry AP, Farrer LA, Jang J, Kolachalama VB, Li R, Yin L, Zhu H. DREAMER: a computational framework to evaluate readiness of datasets for machine learning. BMC Med Inform Decis Mak. 2024 Jun 4;24(1):152. doi: 10.1186/s12911-024-02544-w. PMID: 38831432; PMCID: PMC11149315.

9. Akavoor V, Alabdullatif S, Campbell JD, Cao X, Hong R, Jansen F, Johnson WE, Koga Y, Pervaiz N, Sarfraz I, Wang Y, Wang Z, Yajima M, Zaib SA. Interactive analysis of single-cell data using flexible workflows with SCTK2. Patterns (N Y). 2023 Aug 3;4(8):100814. doi: 10.1016/j.patter.2023.100814. PMID: 37602214; PMCID: PMC10436054.

10. Akhter-Khan S, Alosco M, Ang TFA, Au R, Farrer LA, Lunetta K, Killiany RJ, Mercier G, Mez J, Qiu WWQ, Tao Q, Taylor A, Zhang C ,Zhang X, Zhang Z; Alzheimer's Disease Neuroimaging Initiative. Identification of an APOE ?4-specific blood-based molecular pathway for Alzheimer's disease risk. Alzheimers Dement (Amst). 2023 Oct 16;15(4):e12490. doi: 10.1002/dad2.12490. PMID: 37854772; PMCID: PMC10579631.

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