BTEC

-newsletter sept 2024-

BIOENGINEERING TECHNOLOGY & ENTREPRENEURSHIP CENTER

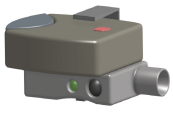
SILab

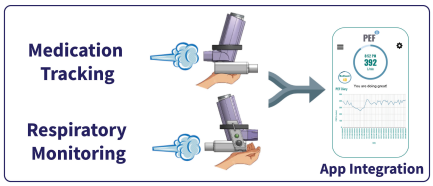
Singh Imagineering Laboratory

BOSTON UNIVERSITY Boston University College of Engineering

BTEC PROJECT HIGHLIGHT

BreatheRight





Yash Patel, Nikita Vinay Kishan, and Luca Pungan (BME, '25)

BreatheRight is an innovative asthma monitoring device with a particular focus on aiding low-income communities where limited healthcare access often leads to poorer health outcomes. BreatheRight enables portable monitoring of respiratory function via peak expiratory flow and provides passive, quantitative, and qualitative medication tracking—key information for primary care providers. The implementation of digital filtering for real-time respiratory distress prediction and machine learning-based user error correction, combined with its compact form, sets BreatheRight apart from other smart inhaler platforms. With housings for both MDI and dry powder inhalers, BreatheRight can address the majority of the asthma market and is set to follow a 510(k) pathway for approval. BTEC played a pivotal role in the project's success, offering resources that enabled rapid prototyping and testing and fostered innovation.

BTEC Advisory Board Members:

PHILIPS, Takeda, EMD Serono, DRAPER, MilliporeSigma, NOVARTIS, AMGEN, C4 Therapeutics, abbvie

upcoming events

BTEC x BMES Design Competition Kickoff
Sept 26 at 6:30, BTEC 201

SWE at BTEC and SILab
Sept 28 at 2:30, SILab

BTEC ENTREPRENEURSHIP SEMINARS

BTEC x GWISE Career Mentoring Reception
Oct 8 at 5, PHO 906

Dean's Imagineering Competition Kickoff
Oct 18 at 4, SILab

BTEC ENTREPRENEURSHIP SEMINARS

Revolutionizing Critical Care Through Microfluidics
Nov 7 at 3:30, Kilachand CILSE 101

Jeffrey Borenstein, PhD
Laboratory Fellow
Draper

Catapult Competition
Nov 23 at 12, Nickerson

SILAB PROJECT HIGHLIGHT

S57 Smart Trash Can by Adonai Gray, Essoha Kadambaya, Nahiyan Muhammad (ME ‘25), Jivesh Jain (EE ‘25), David E. Kim (DS ‘24), Nick Meeks, Polly Peng, Cole Whittington, Josh Yip (CS ‘26), Marek Pinto (CS ‘25), and Manon Fretault (COM ‘24)

The S57 is a smart, portable trash can that uses computer vision and machine learning to automatically sort recyclables from non-recyclables. Powered by a Raspberry Pi and connected to a camera, the system is trained to identify different materials. The system currently has an 85% success rate. The S57 was one of the winning final projects at the Innovate@BU Climate Innovation Challenge in the spring.

BTEC ASSISTANT HIGHLIGHT

Jacob Chin (BME ‘25)

Jacob Chin began working at BTEC during his freshman year. He developed a “bio-ink” for the Cellink BioX 3D Bioprinter based on alginate (an ingredient in the popular drink, Boba!). He developed and ran multiple 3D Bioprinting workshops at BTEC. Additionally, Jacob was the 2023-2024 President of Boston University’s Biomedical Engineering Society, and helped organize the BTEC x BMES Design-a-Thon competition. In this role, Jacob provided BTEC resources and guidance to participants and facilitated a collaborative environment, enhancing student engagement for addressing real-world engineering challenges.

SILAB TECHNOLOGY HIGHLIGHT

FormLabs Form 3+ 3D Printer

Stereolithography (SLA) 3D printing uses a laser to cure liquid resin in precise geometries to make finely detailed 3D printed parts. A wide variety of resins are available, but the most frequently utilized is the clear resin, which allows for the creation of complex shapes that are suitable for use with optical imaging techniques. The SLA printer allows students rapidly iterate through design cycles for, as an example, microfluidic applications.

ENGINEERING STUDENT INNOVATION FUND

Do you have a project that you are working on in BTEC/SILab that could benefit from funding for supplies?

For information on how to apply for funding scan the QR code to the right.

Applications Now Open!

PAST EVENT HIGHLIGHTS

BTEC x BMES Design Competition

The 2nd annual design competition--focused on increasing access to healthcare technologies and incorporating diversity into design to enhance outcomes--concluded at the end of April. The winning projects included an asthma monitoring device, an improved colostomy bag, a wearable alert system for the deaf, and a braille attachment for smart phones.

Engineering Materials in 3D Workshop

In July, BTEC and SILab held a workshop on utilizing SolidWorks 3D modeling, 3D printing, and 3D bioprinting for engineering materials in 3D. Ghaida Aldhahri, Aiden Ly, Jefferey Sheu (BME ‘26), Jackson Zhang (BME ‘28), and Amanda Adams (BME MS) took first prize at the mini design challenge with their design of a bioprinted tooth for dry socket prevention!

Engineering Fabrics Workshop

In August, SILab held a workshop on combining 3D modeling skills with fabrication techniques to engineer fabric-based products. Each student walked away with a reusable bag of their design and the skills needed to create future fabric prototypes.

Summer Outreach

The two-week **First Inspiration in Research in Engineering (FIRE)** program took place in BTEC, introducing **25** high schoolers to engineering through robotics, 3D printing, microfluidics, miniPCR, etc.

The **STEM Pathways High School Research Experience** program visited BTEC to learn about careers in biomedical engineering, molecular modeling of proteins, and plate-based, spectroscopic measurement techniques.

Two **Upward Bound** rising high school seniors interned at SILab over the summer.

Diane Joseph-McCarthy, Executive Director BTEC
Kavon Karrobi, BTEC Manager
Katie Kelso, SILab Manager
For more information, email: **btec@bu.edu**