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Inside the cover:
Researchers led by biomedical engineers at Tufts University invented a microfluidic chip containing cardiac cells that is capable of mimicking hypoxic conditions following a heart attack – specifically when an artery is blocked in the heart and then unblocked after treatment. Published in Nano Letters, the research is a significant advance toward understanding the electrophysiological responses at the cellular level to ischemic heart attacks, and could be applied to future drug development. The team included Assistant Professor Brian Timko, PhD candidate Rotimi Bolonduro, and undergraduate Akshita Rao, pictured, with visiting scholars Haitao Liu and Ning Hu, postdoctoral scholar Jie Ju, PhD candidate Breanna Duffy, Associate Professor Lauren Black, and colleagues from China University of Geosciences.

Principal photography: Anna Miller and Alonso Nichols, Tufts Photography

Note:
All data in this report accurate as of August 2020.
Dean's Message

Dear colleagues,

2020 marks my fifth year as dean, and as I reflect on the great achievements of our students, faculty, and staff, I have never been more proud. Now more than ever, Tufts School of Engineering is serving its communities and contributing to the world as an engine for good.

In the beginning of academic year (AY) 2020, faculty worked with partners to launch new interdisciplinary centers dedicated to data science, living materials, and antimicrobial resistance. To name just a few of the forward-thinking and community-minded research projects in motion, faculty studied air pollution in communities near Boston Logan International Airport, developed a novel 3D contusion model to learn more about the long-term effects of traumatic brain injuries, fabricated innovative transistors on linen sutures that could launch a whole new class of electronics, and used advanced sending, processing, and cognitive technologies to develop a flexible framework for learning environments. Faculty were recognized nationally for their mentoring skills, scholarship, research, and teaching.

Halfway through AY2020, life across the globe was changed by the COVID-19 pandemic. In the face of unprecedented challenges, our students and faculty jumped into action and began inventing and developing innovative solutions to assist in the fight against the virus. Students helped to build cost-effective ventilators, designed personal protective equipment, and volunteered in COVID-19 field hospitals. Faculty are working on projects that range from digital contact tracing and tracking to studying the surface transmission of COVID-19 to troubleshooting the challenges that will be inherent in developing an mRNA COVID-19 vaccine. In addition, Tufts School of Engineering students, faculty, and staff shifted our entire curriculum to virtual learning in the span of just a few weeks during the spring semester, when the campus closed to help limit transmission of the virus.

We have made great progress in our academic offerings this year. 2020 has marked the launch of the School of Engineering’s first two online master’s programs, opening a Tufts graduate education to a broader audience across the globe. Despite the uncertainties raised by the pandemic, our master’s programs have continued to see remarkable growth this year – as I write, we expect an 8% increase in fall 2020 enrollment over fall 2019. Meanwhile, for the second year in a row, undergraduate programs received their highest-ever number of applications, with a 5% increase over last year’s record-setting number.

Toward the end of AY2020, the United States was driven to finally face our history of systemic racism. The School of Engineering and the Tufts community have engaged in deep and substantive conversations about proactive anti-racism, diversity, equity, and inclusion, and the School is crafting action plans to address ending racism in settings from classrooms to labs and beyond. These action plans will work hand in hand with our 2019-2029 strategic plan in which we set forth efforts to provide a diverse and inclusive learning and working environment that promotes fairness and equity, and eliminates all forms of discrimination, at all levels, throughout all constituencies of the institution. We stand committed to ensuring a welcoming environment for all groups historically under-represented in STEM fields and improving the experiences of our students, faculty, and staff of color.

I invite you to read more about the past year at the School of Engineering in the report ahead. While the future will undoubtedly carry difficulties and uncertainties, I am buoyed by the spirit, talent, and generosity of our engineers.

Sincerely,

Jianmin Qu
Dean, Tufts School of Engineering
Karol Family Professor

engineering.tufts.edu
Feature:
Community Response to COVID-19

The COVID-19 pandemic fundamentally changed college campuses across the globe. After Tufts shifted to virtual learning for the remainder of the spring semester, our faculty, students, and staff nimbly adapted. Instructors like Professor David Gute of the Department of Civil and Environmental Engineering (CEE), Associate Professor Douglas Matson of the Department of Mechanical Engineering (ME), and Professor of the Practice Michael Zimmerman (ME) offered students the opportunity to study highly relevant epidemiology topics or develop class projects with meaningful real-world implications like iterating designs for personal protective equipment (PPE).

Faculty and research
Many faculty members pivoted to addressing the pandemic and its effects in their research. Professor of the Practice James Intriligator (ME) worked with colleagues from across the School of Engineering, Tufts School of Medicine, and local municipalities to develop a project that recruits people aged 65 and older — a demographic hit especially hard by the pandemic — to participate in temperature observation and monitoring. As radiologists across the globe realized the need to speedily process chest X-rays, Professor and Dean of Graduate Education Karen Panetta of the Department of Electrical and Computer Engineering (ECE) developed artificial intelligence software that has been successful at identifying COVID-19 pneumonia in more than 99% of the X-ray images it processes.

Tiampo Family Assistant Professor Amy Pickering (CEE) has turned her expertise in hygiene and infectious diseases to studying COVID-19 transmission on public surfaces like door handles and crosswalk buttons in Tufts’ local communities. In the Department of Computer Science (CS), Professor Matthias Scheutz’s Human-Robot Interaction Lab is developing a robot that, guided by algorithms from Professor Diane Souvaine and Visiting Assistant Professor Matias Korman in the Computational Geometry Research Group, could autonomously disinfect rooms using UVC light. Associate Professor Qiaobing Xu Jason Jammallo 3D-printed PPE for Boston-area hospitals from his home.
of the Department of Biomedical Engineering (BME) and colleagues received funding from the Massachusetts Consortium on Pathogen Readiness to address potential challenges in the development of an mRNA-based COVID-19 vaccine.

**Students and alumni**

Our students are giving back and serving their communities in truly exceptional ways. Junior William Liu (ME) used the resources of Tufts’ Nolop FAST Facility makerspace to 3D-print ear savers for staff at Tufts Medical Center and to produce adapters for a cross-country effort that converted snorkel diving masks into scarce PPE for anesthesiologists in California. A group of Tufts engineering students from Tufts Gordon Institute (TGI) and the Department of Mechanical Engineering and peers from MIT and Harvard University, coordinated by fellows from The Fletcher School, developed a process to repair broken elastic on a donation of masks and fixed **more than 6,000 N95 masks** for Tufts Medical Center.

While in a two-week quarantine after returning to her native Thailand, MS student Earn Khunpinit (TGI) mobilized resources and secured Thai Food and Drug Administration approval for her line of affordable, high-quality hand sanitizer. Five engineering undergraduates and alumni (ECE and ME) volunteered with the **Ventilator Project** to build a rapid and scalable low-cost ventilator prototype that is now undergoing independent testing.

As the U.S. grappled with nationwide shortages of personal protective equipment, Tufts engineering alumni stepped up to the plate. Jason Jammallo, EG12 (TGI), bought a 3D printer and printed more than 300 face shields and 250 ear savers for hospitals in Boston. Yukinobu Tanimoto, E14 (CEE), rallied volunteer drivers in the San Francisco Bay Area to deliver PPE, working in partnership with Alissa Brandon, E09 (BME), who led Boston Scientific’s efforts to assemble and donate face shields.
Selected Faculty Achievements

Faculty were recognized by associations at the top of their respective fields this year. Associate Professors Lauren Black and Qiaobing Xu (BME) were both elected to the American Institute for Medical and Biological Engineering College of Fellows. Professor Lenore Cowen (CS) was recognized for mentoring with awards from both the National Center for Women & Information Technology and the Education Committee of the Computing Research Association (CRA). Professor and Chair Kathleen Fisher (CS) was appointed to the CRA’s Computing Community Consortium Council as well as to the board of CRA.

A paper published by Professor and Associate Chair Jeffrey Foster (CS) and collaborators was honored by the Symposium on Principles of Programming Languages (POPL) as its top paper of 2010. Professor Irene Georgakoudi (BME) was elected Fellow of SPIE. Professor Susan Landau (CS) was named a National Associate by the Council of the National Academy of Sciences. Professor of the Practice Ronald Lasser (ECE) and Associate Professor Kristen Bethke Wendell (ME) each received the Henry and Madeline Fischer Award in recognition of their stellar teaching, as voted by Tufts engineering seniors.

Frank C. Doble Professor and Dean of Research Fiorenzo Omenetto (BME) was elected a Fellow of the National Academy of Inventors. Associate Professor Jason Rife (ME) received the Lillian and Joseph Leibner Award for Excellence in Teaching and Advising of Students. Professor Diane Souvaine (CS) was selected as an AWM Fellow by the Association for Women in Mathematics, in recognition of her advocacy for the advancement of women in mathematical sciences. Professor Emeritus Richard Vogel (CEE) was named a Distinguished Member of the American Society of Civil Engineers (ASCE).
Faculty members’ groundbreaking research garnered national recognition. Stern Family Professor in Engineering and Chair David Kaplan (BME) was ranked as one of the top translational researchers in biotech, according to *Nature Biotechnology*. Associate Professor Matthew Panzer and alumnus Anthony D’Angelo of the Department of Chemical and Biological Engineering (ChBE) were named the winners of the 2020 *Chemistry of Materials* Lectureship and Best Paper Award, for their paper’s outstanding influence across the field of materials chemistry. Professor Matthias Scheutz and PhD candidate Vasant Sarathy (CS) won a grand prize in the National Science Foundation Idea Machine Competition with their proposal to work with machines to solve humanity’s seemingly intractable problems. Assistant Professor James Van Deventer (ChBE) received an NIH Outstanding Investigator Award to establish a comprehensive discovery platform that could lead to new classes of enzyme inhibitors.

Xiaocheng Jiang (BME) was appointed to the John A. and Dorothy M. Adams Faculty Development Assistant Professorship. Professor of the Practice Eric Hines (CEE) was named the Kentaro Tsutsumi Faculty Fellow. Bridge Professor Abani Patra (CS) was named the Stern Family Professor. Raja Sambasivan (CS) was named the Ankur and Mari Sahu Assistant Professor. Associate Professor Kristen Wendell (ME) was named the Stacey and Robert Morse Fellow. Three faculty members — John Durant (CEE), Babak Moaveni (CEE), and Jason Rife (ME) — were promoted to full professor, and three additional faculty — Fahad Dogar (CS), Jeffrey Guasto (ME), and Nikhil Nair (ChBE) — were promoted to associate professor.
Selected Student and Alumni Achievements

Tufts engineering students are conducting world-changing research. Senior Priya Misner (ME) received a Fulbright-Nehru Student Research Fellowship to explore the effectiveness of virtual reality driving simulations in promoting road safety. Senior Samuel Shaw was named a finalist in the Computing Research Association’s (CRA) Outstanding Undergraduate Researcher Awards, while three fellow computer science majors received honorable mentions. PhD candidate Matthew Bliss (ChBE) was the first Tufts student to ever receive a U.S. Department of Energy Office of Science Graduate Student Research award, furthering his studies in sustainable energy production and storage technologies.

From engineering to athletics to the arts, our students excel. Junior Talia Toland (ME) won the New England Intercollegiate Sailing Association Single-handed Championship. Human factors engineering major Emai Lai (ME) was awarded the grand prize in the Provost’s My Tufts Story Video Contest, which highlighted the multi-faceted and interdisciplinary nature of a Tufts education. Senior Daniel Bekai (ME), data science major Alyssa Rose (CS), senior Amel Hassan (CS), and PhD candidate Olukunle Owolabi (ME) each won prizes for their videos as well.

Tufts engineering students have risen to the occasion to provide remarkable service in ways that go beyond the classroom. Senior April Weintraub (CEE), E20, and PhD candidates Jessica Stieglitz (ChBE) and Sara Willner-Giwerc (ME) received 2020 Tufts Presidential Awards for Civic Life in recognition of their outstanding impacts on communities near and far.
Undergraduate and Graduate Education

Undergraduate education: The School continued its focus on providing hands-on, iterative learning opportunities in undergraduate engineering courses, splitting students into productive small-class environments. Departments collaborated on interdisciplinary capstone curricula, with Computer Science, Human Factors Engineering, and Electrical and Computer Engineering offering the opportunity for students to create cross-disciplinary senior design project teams. The School expanded its co-op programs — first piloted in the Department of Biomedical Engineering — to more departments this year, as Mechanical Engineering and Computer Science students were able to participate in the first step of the program in fall 2020 and will be eligible to secure co-op positions next year.

Undergraduate programs reached their highest application rate ever this year, with 4,576 applications - a 5% increase over last year’s banner numbers. The acceptance rate was 15.3%. The Class of 2024 is comprised of 49% women, 41% U.S. citizens who are people of color, 13% international students, and 14% first-generation college students.

Graduate education: For the fifth year in a row, the SOE saw a record increase in master’s admissions, with a 41% projected increase in fall MS applicants, a 38% increase in fall MS admits, and an 8%* projected increase in fall enrollments over fall 2019. The SOE launched its first two online MS programs in 2020 with offerings in Computer Science and in Engineering Management, as well as new on-campus MS programs in Cybersecurity and Public Policy (an interdisciplinary effort with The Fletcher School) and in Software Systems Development.

*Significantly smaller than initially-expected enrollment increase due to COVID-19 related issues and travel restrictions.

Undergraduate Applications

![Graph showing the number of undergraduate applications from 1996 to 2020. The number of applications has increased steadily over the years, with a significant rise in recent years.](engineer.tufts.edu)
## Enrollment and Degrees Awarded

<table>
<thead>
<tr>
<th>Engineering Program</th>
<th>2019-20 Enrollment</th>
<th>Engineering Degrees Granted¹</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BS</td>
<td>MS</td>
</tr>
<tr>
<td>Architectural Studies</td>
<td>2</td>
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<tr>
<td>Bioengineering</td>
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<td>25</td>
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<tr>
<td>Biomedical Engineering*</td>
<td>138</td>
<td>34</td>
</tr>
<tr>
<td>Biotechnology Engineering</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Chemical Engineering*</td>
<td>109</td>
<td>6</td>
</tr>
<tr>
<td>Civil Engineering*</td>
<td>76</td>
<td>—</td>
</tr>
<tr>
<td>Civil and Environmental Engineering***</td>
<td>—</td>
<td>29</td>
</tr>
<tr>
<td>Cognitive Science**</td>
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<tr>
<td>Computer Engineering*</td>
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<tr>
<td>Computer Science*</td>
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<td>Computer Science (from School of Arts and Sciences)</td>
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<tr>
<td>Data Science</td>
<td>32</td>
<td>16</td>
</tr>
<tr>
<td>Electrical Engineering*</td>
<td>74</td>
<td>48</td>
</tr>
<tr>
<td>Electrical and Computer Engineering****</td>
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<td>—</td>
</tr>
<tr>
<td>Engineering Management</td>
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<tr>
<td>Engineering Physics</td>
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<tr>
<td>Engineering Psychology/Human Factors</td>
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<tr>
<td>Engineering Science</td>
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<tr>
<td>Environmental Engineering*</td>
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<td>Environmental Health</td>
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<tr>
<td>Human-Robot Interaction**</td>
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<tr>
<td>Innovation and Management (On Campus)</td>
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<tr>
<td>Innovation and Management (Online)²</td>
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<tr>
<td>Materials Science and Engineering**</td>
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<tr>
<td>Mechanical Engineering*</td>
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<td>Offshore Wind Energy Engineering²</td>
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<tr>
<td>No Major</td>
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<tr>
<td>TOTAL (Engineering only):</td>
<td>1004</td>
<td>515</td>
</tr>
</tbody>
</table>

¹ Engineering degree programs accredited by the Engineering Accreditation Commission (EAC) or the Computing Accreditation Commission (CAC) of the Accreditation Board for Engineering and Technology (ABET).

*Includes Civil Engineering degrees in Architectural Studies and Environmental Health.

** Joint degree program. Students are only counted once for the sake of this chart, but are also assigned to a home in the School of Engineering, the School of Arts and Sciences, or The Fletcher School, depending on program.

*** For BS degrees, Civil Engineering and Environmental Engineering are two separate degrees. For graduate degrees, Civil and Environmental Engineering are listed together.

**** For BS and MS degrees, Electrical Engineering and Computer Engineering are two separate degrees. For PhD, Electrical and Computer Engineering are listed together.

¹ First majors, August 2019 to May 2020. Second majors and minors are not included.

² New program.
This fiscal year, externally-sponsored research expenditures in the School of Engineering totaled $31.767 million, compared to $29.62 million in the third quarter of 2019, marking an increase of approximately 7.2% year-over-year. Faculty submitted 379 new and supplemental funding requests, setting a new School record for research activity. Invention disclosures from the School of Engineering continued to constitute half of the university’s total technology transfer activity.

Energy, water, and the environment: In research published in PLoS Medicine, Tiampo Family Assistant Professor Amy Pickering (CEE) and colleagues found that improved drinking water should be a key component of control strategies against parasitic worm and protozoan infections. Researchers including Research Assistant Professor Neelakshi Hudda (CEE) discovered harmful air pollution in a detailed study of communities surrounding Boston Logan International Airport.

Human health and bioengineering: Detailed in research published in Advanced Healthcare Materials, a team led by Tufts biomedical engineers developed a 3D contusion model that could be used to study the long-term effects of traumatic brain injuries, which include neurodegeneration and mental illness. In a step toward bedside detection, a team of Tufts researchers including Professor Irene Georgakoudi and Associate Professor Lauren Black (BME) developed a method using fluorescence to detect pre-cancerous metabolic and physical changes in epithelial cells lining the cervix. PhD student Fan Zhang and Professor Emmanuel Tzanakakis (ChBE) engineered pancreatic beta cells “switched on” by light to enhance production of insulin in response to glucose levels.
Human-technology interface: Associate Professor Valencia Koomson (ECE) received National Science Foundation funding to develop a first-of-its-kind wearable device to help doctors monitor patients’ tissue oxygenation without requiring access to a heavy power source. A group of Tufts engineers (ChBE and ECE) fabricated transistors on standard linen sutures, opening the way for a highly flexible class of electronics. The School of Engineering became home to a new strategic priority center — the Laboratory for Living Devices will redefine materials for use in global health and sustainability, with an industry consortium underpinning the endeavor.

Intelligent systems: Professor Matthias Scheutz (CS), in collaboration with Arizona State University, received a $6.7 million grant from DARPA to develop AI architecture that can cope with any aspect of open worlds. With funding from the National Science Foundation, Associate Professor Mark Hempstead (ECE) is developing a flexible framework for instrumented learning environments and enhanced learning through advanced sensing, processing, and cognitive technologies.

Learning science: Developed by researchers at Tufts’ Center for Engineering Education and Outreach (CEEO), the Novel Engineering program helps teachers introduce engineering concepts to children and foster creativity through reading. The T-TRIPODS Institute launched this year with a $1.5 million National Science Foundation grant to build the foundation for a data-intensive studies center at Tufts.

Invention Disclosures
Faculty Recruitment

Tufts Engineering’s number of tenure-track faculty rose to 91 this year. Five new tenure-track faculty members, two teaching professors, and two full-time lecturers joined the School in academic year 2019-20. New arrivals who joined the School last year and will join this year include:

**Nadine Aubry**
*Provost and Senior Vice President, Tufts University; Professor, Mechanical Engineering*
Nadine Aubry came to Tufts as the university’s new Provost. Prior to joining Tufts, she served as Dean of the College of Engineering at Northeastern University and was Head of the Department of Mechanical Engineering at Carnegie Mellon University. Her research focuses on fluid dynamics.

**Marco Donato**
*Assistant Professor, Electrical and Computer Engineering*
Prior to joining Tufts, Marco Donato was a postdoctoral fellow in the John A. Paulson School of Engineering and Applied Sciences at Harvard University. His research focuses on leveraging emerging technologies to design reliable and energy-efficient hardware. He holds a PhD from Brown University.

**Nathaniel Eagan**
*Assistant Professor, Chemical and Biological Engineering*
Nathaniel Eagan’s research aims to develop and understand novel catalytic processes which improve the sustainability of fuel and chemical syntheses. Before joining the Tufts faculty, he spent two years as a postdoctoral associate in the IMASC EFRC, first at Tufts and then at Harvard University.

**Bert Huang**
*Assistant Professor, Computer Science*
Bert Huang earned his PhD from Columbia University and previously was an assistant professor at Virginia Tech. His research addresses topics surrounding machine learning, including structured prediction, weakly supervised learning, and algorithmic fairness.

**David Lillethun**
*Assistant Teaching Professor, Computer Science*
David Lillethun teaches in the areas of programming, operating systems, networking, and distributed systems and has additional interests in computer science education, cybersecurity, and computing and society. He received his MS and PhD from Georgia Tech, and he joins Tufts from Seattle University.

**Aseema Mohanty**
*Clare Boothe Luce Assistant Professor, Electrical and Computer Engineering*
Aseema Mohanty’s work focuses on using nanophotonics and engineered light-matter interactions to create miniaturized, high performance optical circuits that control, shape, and sense light. She received her MS and PhD from Cornell University, and conducted her PhD and postdoctoral research at Columbia University.
Abani Patra
Stern Family Professor, Computer Science and Mathematics; Director, Data Intensive Studies Center (DISC)
Abani Patra researches computational issues in large scale and data driven modeling. He is trained in computational mathematics. Before coming to Tufts as a bridge professor, he was the founding director of the Institute for Computational and Data Sciences at University at Buffalo, SUNY.

Daniel Votipka
Assistant Professor, Computer Science
Daniel Votipka’s research focuses on computer security, with an emphasis on the human factors in security professional tasks, such as vulnerability discovery, network defense, and malware analysis. He earned his PhD at the University of Maryland and completed an MS at Carnegie Mellon University.

In a wind tunnel, Associate Professor Rob White and collaborators tested their designs for a sonic anemometer that could one day measure wind speed on Mars. Photo courtesy of Rob White.

Faculty Growth and Composition

2020 Annual Report | School of Engineering
Advancement and Outreach

**Overall Advancement:** The School of Engineering raised $14.126 million in fiscal year 2020, marking the fourth year in a row that the school has raised over $10 million. More than 3,200 donors gave to the School this year, an inspiring amount of support despite all the challenges faced. Gifts to the Tufts Fund for Engineering increased 9% over last year and capital and estate gifts increased 49% over last year. The School continues to lead the way in the Brighter World: The Campaign for Tufts capital campaign, having raised $94 million towards our new goal of $100 million. The School thanks all our donors for their generosity to help educate the next generation of engineering leaders.

**Corporate and Foundation Relations:** This year, corporate and foundation achievement for the School of Engineering totaled $4.6 million, an increase of 8% over last year. Funding included an award from the Bill and Melinda Gates Foundation for Stern Family Professor in Engineering and Department Chair David Kaplan (BME) to optimize silk-based microneedle delivery systems for long-term sustained contraceptive protection, in a joint project with Vaxess Technologies, Inc. Professor and Dean of Graduate Education Karen Panetta (ECE) won three fellowships from Last Call Foundation to support PhD students’ work on a vision-guided artificial intelligence platform for firefighting.

**Alumni Outreach:** The School welcomed visionary business leader Andy Youniss to deliver the fall Dean’s Lecture on the success of his firm, Rocket Software, and how its growth has roots in a humanist outlook. Our annual celebration of National Engineers Week engaged more than 250 alumni to network with students, offer industry advice, and judge projects. Finally, engineering faculty closed the year talking with alumni about children’s technology use and how to ensure productive engagement during the COVID-19 pandemic.

**Career Center:** Tufts Career Center continued to help engineering students prepare for the workplace. This year, advisors provided consultations to engineering undergraduate and graduate students. A record number of companies attended the fall and spring career fairs, and the Career Center continued to deliver specialized career-related programs for engineers and organized networking events for students and alumni.
Diversity

The School of Engineering reached a celebratory milestone with the arrival of the Class of 2023. For the first time in the school's history, women accounted for 50% of the first-year class. Also, this year, the American Society for Engineering Education (ASEE) named the School as a Bronze Level Awardee in its Diversity Recognition Program, honoring the School's established programs which support students from underrepresented populations in pursuing engineering disciplines. The Bronze Level Award, the highest award given for first-year nominees, will extend through 2022, at which point the School may seek Silver and Gold Level recognition.

The Center for STEM Diversity (CSD) supported students through its four flagship programs this year: Bridge to Engineering Success at Tufts (BEST), Redefining the Image of Science and Engineering (RISE), STEM Ambassadors, and the Louis Stokes Alliance for Minority Participation (LSAMP). The BEST program graduated five seniors, the majority of whom went on to careers in industry at companies like Interra and Rapid7. A generous gift from a donor allowed the CSD to support BEST scholars in taking summer classes, and the program welcomed its eleventh cohort of scholars with an entirely virtual program during the summer of 2020.

Through the STEM Ambassadors program, 15 first-generation college students visited high school classrooms to deliver science and engineering presentations, run hands-on activities, and talk to local students about college. Nine new ambassadors joined the program in 2020, bringing the total number of ambassadors to an all-time high. The RISE first-year advising seminar supported 30 students this year, with training focused on providing resources and tools to optimize their social and emotional well-being and their academic success. The School of Engineering and the School of Arts and Sciences accepted five new GEM Fellows, who receive support from the CSD as they pursue graduate degrees.

STEM Ambassadors and staff attended the national STEM ambassadors conference in the fall.

The Center for STEM Diversity hosted the Northeast Louis Stokes Alliance for Minority Participation Symposium.
Engineering Education

This year, the Center for Engineering Education and Outreach (CEEO) published a book with NSTA Press. Novel Engineering, K-8: An Integrated Approach to Engineering and Literacy was written by CEEO faculty, staff, alumni, and graduate students. The book guides teachers through the CEEO’s Novel Engineering approach, in which students identify problems in books they read, then design and build solutions for the characters.

Throughout the course of the year, the CEEO provided professional development training to more than 120 teachers and, through the Student Teacher Outreach Mentorship Program (STOMP), worked with over 400 students in local K-12 classrooms. The CEEO pivoted many of its offerings to virtual activities this spring and summer, including online experiences for K-12 students. The Teacher Engineering Education Program (TEEP) continued to serve teachers from across the globe amid the pandemic, with teachers shifting from classroom evaluations to online tools in order to complete their spring coursework.

Applied Brain and Cognitive Sciences

The Center for Applied Brain and Cognitive Sciences (CABCS) was renewed for the next 10 years with a substantial commitment from the U.S. Army, showcasing the deeply innovative collaboration between Tufts School of Engineering, Tufts School of Arts and Sciences, and the Army’s Combat Capabilities Development Command Soldier Center. The CABCS provides an innovative environment for conducting collaborative applied research focusing on measuring, predicting, and enhancing cognitive capabilities and human system interactions for individuals and teams working in naturalistic high-stakes environments.
This year, Tufts Gordon Institute (TGI) and the School of Engineering launched an online master’s program in engineering management (MSEM), with students who work for ten different companies joining the Tufts community from across the U.S. and Russia. A survey of recent TGI graduates revealed that 60% of MSEM students received promotions while enrolled in the program and continued to see increased salaries and responsibilities after graduation, while recent graduates from the MS in Innovation and Management (MSIM) program landed high-impact jobs at leading companies in a variety of industries, including iRobot, Oracle, Google, and Amazon.

MSIM students partnered with Engineering faculty on innovation sprint projects, developing investable business plans based on Tufts research. ZwitterCo, an industrial wastewater filtration venture that commercialized Associate Professor Ayse Asatekin’s (ChBE) research, recently received substantial funding from the U.S. Department of Energy. Another start-up, Cellens, developed Professor Igor Sokolov’s (ME) work into a non-invasive screening platform for bladder cancer.
Inspirational Gifts

» $1.8 million gift to support undergraduate financial aid along with social justice and civic action efforts from a Tufts alumni couple

» $1.2 million in charitable gift annuities to benefit School of Engineering capital needs and projects from a member of the Class of 1956

» $1 million gift to create a new endowed School of Engineering junior professorship from Tufts parents

» $1 million gift to support undergraduate financial aid from Tufts parents

» $1 million estate gift to provide unrestricted support to the School of Engineering from a Tufts graduate alumna from the Class of 1993 and spouse, who are also Tufts parents

» $750,000 gift to create a new endowed School of Engineering junior professorship from an Engineering Board of Advisors alumnus from the Class of 1983 and spouse, who are also Tufts parents

» $535,000 gift to create a new endowed undergraduate scholarship as well as an estate gift to benefit the School of Engineering from a Tufts Trustee and spouse, who are also Tufts parents

» $100,000 gift to support the Center for Engineering Education and Outreach (CEEO) and its STOMP program from an anonymous donor

» $100,000 gift to support Biomedical Engineering faculty research from a family foundation