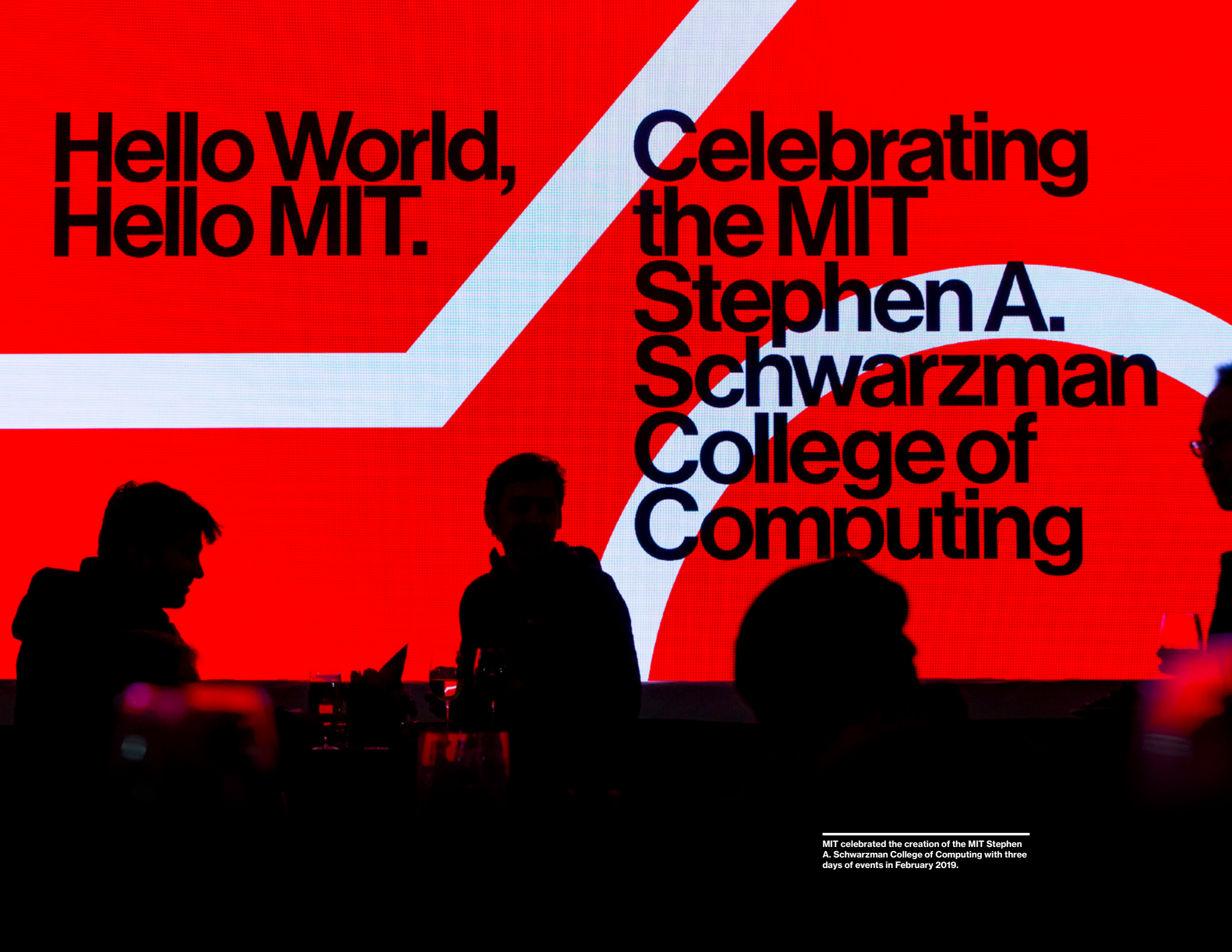
Impact Report 2019–2020

MIT Schwarzman College of Computing

“With impressive speed, the MIT Stephen A. Schwarzman College of Computing has become a part of the fabric of MIT. Its profound impact on computing research and education at the Institute is helping us think deeply about how the technologies we invent can best serve, support, and care for our global human family.”

L. Rafael Reif
MIT President



MIT celebrated the creation of the MIT Stephen A. Schwarzman College of Computing with three days of events in February 2019.

For centuries, as new technologies have come along, it has often proven challenging to determine what kinds of impact they are going to have in the world, with the enduring effects sometimes not becoming apparent until many years later. For computing technologies, which are being developed at such a rapid pace, each technology generation brings unforeseen opportunities and challenges often before we understand the impact of previous ones. Thus, we find ourselves in a time when technology, especially with the rising prevalence of artificial intelligence, is well ahead of our understanding of its impact—a time when advances in computing have undeniably altered much of how we live and work, yet so much of the technological advancement and impact remains to happen.

We created the MIT Stephen A. Schwarzman College of Computing to lead the transformation of education and research in this time of rapid advances in computing and its increasing influence on so many aspects of daily life. A world that now, more than ever, needs the brightest minds to address the myriad challenges we face during this unique time in history. Advances in computer science, AI, and other areas of computing offer tremendous potential for addressing national and global challenges. But at the same time, it is increasingly important to pursue the development of computing technology, particularly AI, in a holistic manner that addresses broader societal context and impact.

Starting last fall, we have been building a solid foundation for the college while at the same time piloting new programs and activities. We have restructured academic programs and created new areas that cross disciplinary boundaries to increase connections and collaborations in computing across MIT. We are changing ways in which we develop what we teach and rethinking how our research activities are organized to bring the social sciences, humanities, business management, design, and the arts together with computing and AI. We are hiring outstanding new faculty members. Above all, we are positioning students, faculty, and researchers at MIT to understand computing and its societal context and to be able to advance computing and its applications in every domain.

This first year of creating the college has been nothing short of extraordinary. I'm grateful to the many members of the MIT community who have given, and continue to give, their time and effort to this bold endeavor. While much remains to be done, I'm excited to share the progress we have made during the inaugural year. Together we are making great strides.

Sincerely,

Daniel P. Huttenlocher SM '84, PhD '88

Dean, MIT Stephen A. Schwarzman College of Computing

College leaders, from left: David Kaiser, Julie Shah, Daniel Huttenlocher, Asu Ozdaglar, and Daniela Rus.

Organizational Structure

Over the past 18 months, the MIT Stephen A. Schwarzman College of Computing (SCC) has propelled MIT to undertake a series of rapid changes that are nothing short of a reorientation of the entire Institute. These changes are serving as a model for the world. Recognizing that computing fields are evolving beyond current academic structures, the SCC is boldly leveraging existing resources, launching new activities and programs, and infusing MIT with exceptional talent in computing.

The College Mission

Supporting rapid growth and evolution of computing fields, notably computer science and AI

Coordination

Collaboration

Adaptability

Facilitating computing collaborations across departments and disciplines

Education and research

All five schools at MIT, and beyond

Focusing on social and ethical responsibilities of computing

Blending humanist, social science, policy, and technical perspectives

The college is structured around three key focus areas that inform and amplify each other. Together, these areas are critically important in meeting the opportunities and challenges posed by today's and tomorrow's computing technologies. The SCC is facilitating the coordination and alignment of existing computing education and research at MIT, providing opportunities for improvement, and introducing new programs and units to address emerging and cross-cutting areas. The SCC's versatile structure will be assessed and revised regularly to address the rapidly changing landscape of the field.

The College and the Five Schools at MIT

The college stands in a unique position, both supporting and drawing strength from MIT's five schools: the School of Engineering; the School of Science; the School of Humanities, Arts, and Social Sciences; the MIT Sloan School of Management; and the School of Architecture and Planning. The SCC represents the first major structural change since the early 1950s, when the School of Humanities, Arts, and Social Sciences and MIT Sloan were established. Through a variety of programs and affiliations, the college is building faculty collaborations in computing across the Institute, and, in concert with departments and schools, it is facilitating novel educational pilots and emergent areas of computing education, research, and practice.

A Powerful Cohort

Existing labs, centers, and other units focused on computing, formerly operating in different areas of the Institute, are now a powerful, unified cohort within the college. This additional level of coordination and alignment is generating greater momentum for the exceptional education and research in computing and AI already taking place across MIT.

"College"

The **Schwarzman College of Computing is called a college** to differentiate it from the five schools and to signal that its programs and faculty span the Institute.

Department of Electrical Engineering and Computer Science (EECS)

The largest academic department at MIT, educating and mentoring hundreds of undergraduate and graduate students for career leadership in academia, industry, and government, through a rigorous and innovative curriculum and with world-class faculty. Jointly part of the college and the School of Engineering.

Operations Research Center (ORC)

A graduate program in operations research. ORC's community of scholars and researchers work collaboratively to connect data to decisions to solve problems. Jointly part of the college and MIT Sloan.

Institute for Data, Systems, and Society (IDSS)

Advances education and research in state-of-the-art analytical methods in information and decision systems, statistics and data science, and the social sciences, and applies these methods to address complex societal challenges in a diverse set of areas such as finance, energy systems, urbanization, social networks, and health.

IDSS programs include:

- **Technology and Policy Program (TPP)**, which addresses societal challenges through education and research at the intersection of technology and policy.
- **Sociotechnical Systems Research Center (SSRC)**, an interdisciplinary research center that focuses on the study of high-impact, complex, sociotechnical systems.

Center for Computational Science and Engineering (CCSE)

Supports computational science and engineering education and research. The emphasis of CCSE is on the development of new computational methods relevant to engineering disciplines and on the innovative application of computational methods to important problems in engineering and science (see sidebar on opposite page).

Computer Science and Artificial Intelligence Laboratory (CSAIL)

The largest interdepartmental laboratory at MIT, CSAIL focuses on developing fundamental new technologies, conducting basic research that furthers the field of computing, and inspiring and educating future generations of scientists and technologists.

Laboratory for Information and Decision Systems (LIDS)

An interdepartmental research center at MIT committed to advancing education and research in the analytical information and decision sciences, specifically systems and control, communications and networks, and inference and statistical data processing.

MIT Quest for Intelligence (MIT Quest)

An MIT-wide initiative bringing together more than 200 investigators working on the science and engineering of intelligence. The MIT Quest addresses two fundamental questions: How does human intelligence work, in engineering terms? And how can we use our understanding of human intelligence to build smarter machines for the benefit of society?

MIT-IBM Watson AI Lab

A community of scientists at MIT and IBM Research is conducting AI research and works with global organizations to advance AI hardware, software, and algorithms related to deep learning and other areas; increase AI's impact on industries such as health care and cybersecurity; and explore the economic and ethical implications of AI on society.

Abdul Latif Jameel Clinic for Machine Learning in Health (Jameel Clinic)

Jameel Clinic is developing AI technologies that will change the landscape of health care, including early diagnostics, drug discovery, and care personalization and management. Building on MIT's pioneering history in AI and the life sciences, Jameel Clinic works on novel algorithms suitable for modeling biological and clinical data across a range of modalities including imaging, text, and genomics.

73

dean's meetings with groups regarding college planning

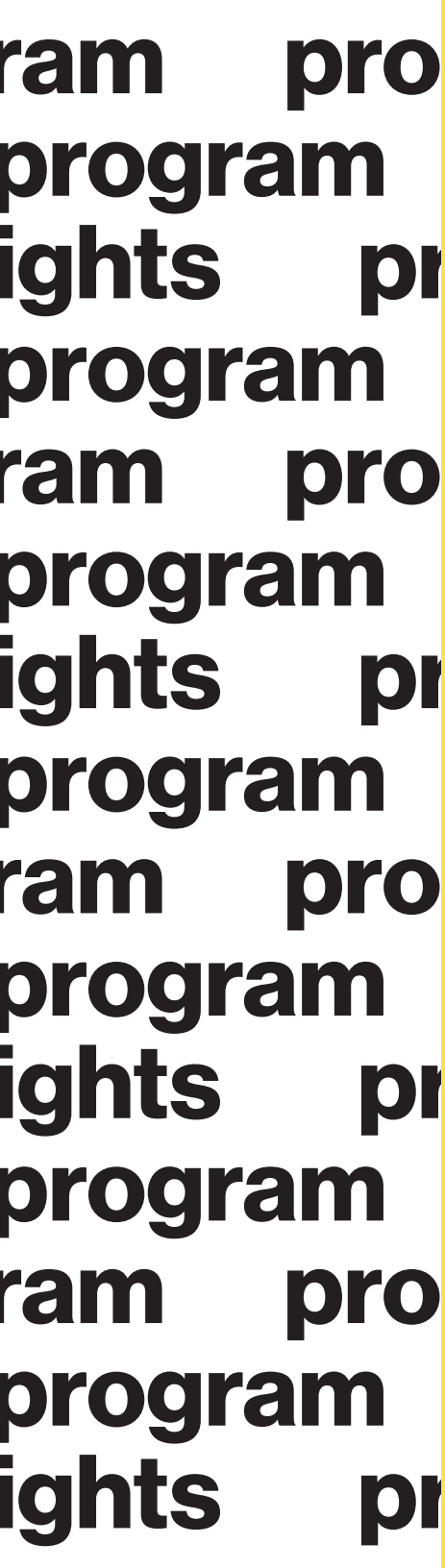
10^3

Thousands of students and **hundreds of faculty** in the SCC units are now SCC members, often jointly with other schools

In January 2020, the Center for Computational Engineering was renamed the Center for Computational Science and Engineering (CCSE) and became one of the core academic units of the Schwarzman College of Computing. The new name reflects CCSE's deepening engagement with the sciences at MIT and helps align the center's name with that of the computational science and engineering PhD program.

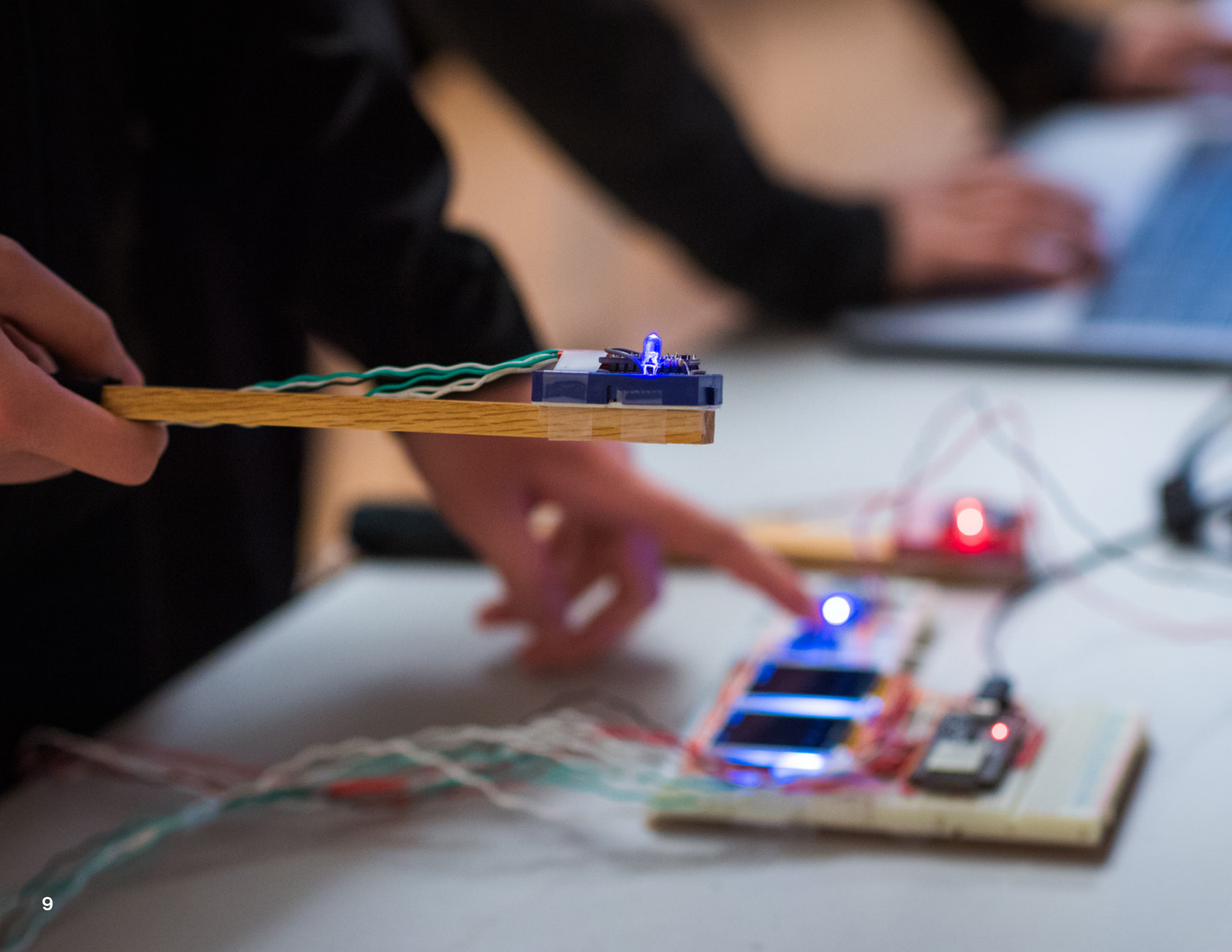
In partnership with the college Dean's Office, CCSE is developing a plan for its broadening engagement, including an expected substantial role in the numerical, simulation, and data science curriculum and classes in the Common Ground for Computing (see page 14), possibly eventually including minors or additional degrees, and also involving collaboration with the Social and Ethical Responsibilities of Computing (see page 11).

A crash course in deep learning reaches more than 350 MIT students each year; more than a million other people have watched course lectures online over the past three years.



Program Highlights

The Schwarzman College of Computing is building collaborations across MIT's schools and departments via a variety of new programs and affiliations, including the Common Ground for Computing Education, a new teaching collaborative for disciplinary and interdisciplinary computing. Through academic structures that are more flexible and interconnected than conventional departments and schools, the college intends to facilitate continued change while at the same time reinforcing MIT's strength in fields such as computer science.



Restructuring EECS

As part of the founding of the college, the Department of Electrical Engineering and Computer Science (EECS) was restructured to enhance existing programs, create new opportunities, and increase connections to other parts of the Institute.

EECS, the largest academic unit at the Institute, is now jointly part of the MIT School of Engineering and the college. It is composed of three overlapping academic units called Faculties: electrical engineering (EE), computer science (CS), and artificial intelligence and decision making (AI+D), which bring together computer science-heritage artificial intelligence and machine learning with electrical engineering-heritage information and decision systems to exploit their significant synergies. EECS remains responsible for the Course 6 curriculum.

Joel Voldman SM ’97, PhD ’01, the Clarence J. Lebel Professor of Electrical Engineering, is head of the EE Faculty. Arvind, the Jennifer C. Johnson Professor of Computer Science and Engineering, is leading the CS Faculty. Antonio Torralba, the Thomas and Gerd Perkins Professor of Electrical Engineering and Computer Science, is head of the AI+D Faculty. The three faculty leaders are contributing to the overall leadership of EECS under the direction of department head Asu Ozdaglar SM ’98, PhD ’03, SCC deputy dean of academics and the MathWorks Professor of Electrical Engineering and Computer Science.

Left: Students work on projects for the course 6.08 Introduction to EECS via Interconnected Embedded Systems, which introduces students to multiple platforms, servers, databases, and microcontrollers. Above: An Independent Activities Period class on game design.

3

Overlapping academic Faculties in EECS:

- Electrical Engineering (EE)
- Computer Science (CS)
- Artificial Intelligence and Decision Making (AI+D)

22

SERC Advisory Board members
intersecting all five schools

55

members from **19 departments, labs, and centers** on the SERC Case Studies Editorial Board

Social and Ethical Responsibilities of Computing

A new cross-cutting area in the college, the Social and Ethical Responsibilities of Computing (SERC) is facilitating the development of responsible "habits of mind and action" for those who create and deploy computing technologies and fostering the creation of technologies in the public interest.

SERC evolved during months of meetings with faculty across the Institute. Catalyzed by these sessions, SERC's co-leaders—SCC associate deans Julie Shah '04, SM '06, PhD '11, associate professor in the Department of Aeronautics and Astronautics, and David Kaiser, the Germeshausen Professor of the History of Science and professor of physics—are developing an approach that draws on the expertise of colleagues from a wide range of fields.

Through a teaching, research, and engagement framework that includes case studies and active learning projects, a research exchange and dissertation clinic, and a policy lab and public forums, SERC is working to train students, encourage research to assess the broad challenges and opportunities associated with computing, and improve design, policy, implementation, and impacts.

Shah and Kaiser are also co-chairing a committee, together with MIT vice president and general counsel Mark DiVincenzo, focused on legal, ethical, and equity aspects related to campus planning and operations amid the Covid-19 pandemic.

“We need new ideas and insights coming from multiple directions. Getting discussions and collaborations going across different disciplines, and with groups outside the Institute, is both a goal and a measure of our success.”

David Kaiser

Associate Dean, Social and Ethical Responsibilities of Computing, SCC
Germeshausen Professor of the History of Science
Professor of Physics

“At the top of our list of learning objectives is the idea that technology alone can’t solve many problems, and that our tools come with values incorporated in them. We need to complicate students’ thinking, so as they code, experiment, and build systems, they are cognizant of ethics and impacts.”

Julie Shah ’04, SM ’06, PhD ’11

Associate Dean, Social and Ethical Responsibilities of Computing, SCC
Associate Professor, Department of Aeronautics and Astronautics
Head, Interactive Robotics Group

“It is exciting to bring together different areas of computing with methodological and substantive commonalities as well as differences around one table. MIT faculty increasingly want to collaborate in topics around computing. The college is enabling the types of interactions that are needed to foster new ideas.”

Asu Ozdaglar SM ’98, PhD ’03

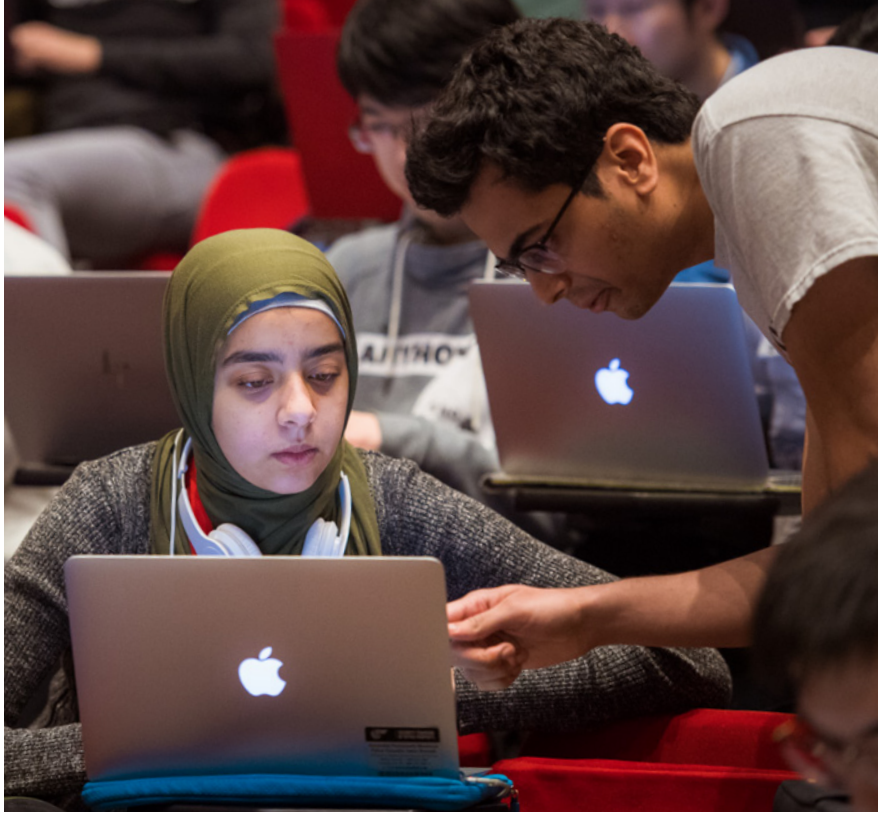
Deputy Dean of Academics, SCC
Department Head, EECS
MathWorks Professor of Electrical Engineering and Computer Science

Common Ground for Computing Education

Under the leadership of Asu Ozdaglar SM ’98, PhD ’03, SCC deputy dean of academics, EECS department head, and the MathWorks Professor of Electrical Engineering and Computer Science, the college is developing the Common Ground for Computing Education, an interdepartmental teaching collaborative that will facilitate the offering of computing classes and coordination of computing-related curricula across academic units.

The objectives of this collaborative are to provide opportunities for faculty across departments to work together, including co-teaching classes, developing computing classes at the knowledge frontier that are blended within a specific domain, and facilitating undergraduate blended degrees such as 6-14 Computer Science, Economics, and Data Science, 6-9 Computation and Cognition, 11-6 Urban Science and Planning with Computer Science, and 18-C Mathematics with Computer Science.

The scope of Common Ground includes classes in CS and AI that are widely taken by students outside EECS; classes in computing offered in other disciplines across MIT, such as numerical and simulation methods; and classes in the social and ethical responsibilities of computing. Common Ground is expected to have substantial involvement with SERC.



The Common Ground for Computing Education will pave the way for more undergraduate blended computing degrees across MIT.

The startup macro-eyes is bringing new techniques in machine learning and artificial intelligence to global health problems like vaccine delivery and patient scheduling.

Research Impact

As humanity works to solve problems ranging from climate change to curing disease, removing inequality, ensuring sustainability, and eliminating poverty, computing is opening the door to important new solutions. The following research examples demonstrate the scope and power of computing research undertaken by the labs, units, and centers in the MIT Schwarzman College of Computing. Drawing on the momentum of its launch, the college is quickly engaging faculty, students, and global collaborators from across a vast array of disciplines.

A CSAIL research team, in collaboration with Ava Robotics and the Greater Boston Food Bank, designed a robotic system utilizing UV-C light that disinfects surfaces and neutralizes aerosolized forms of the novel coronavirus.

A breakthrough for safe, self-driving vehicles

A primary challenge in the development of autonomous vehicles is weather. Self-driving cars typically rely on either LiDAR (light detection and ranging) sensors or cameras that are vulnerable to conditions like snow, which obscures cameras and may cause sensors to malfunction.

A team in the Computer Science and Artificial Intelligence Laboratory (CSAIL) has developed a new system based on existing technology called ground-penetrating radar (GPR), which sends electromagnetic pulses underground to measure the area's specific combination of soil, rocks, and roots.

Daniela Rus, deputy dean of research for the Schwarzman College, director of CSAIL, and the Andrew and Erna Viterbi Professor of Electrical Engineering and Computer Science, believes GPR offers exciting potential for autonomous vehicles. "Our work demonstrates that this approach is actually a practical way to help self-driving cars navigate poor weather without actually having to be able to 'see' in the traditional sense using laser scanners or cameras."

Linking data to critical decisions

At the Operations Research Center (ORC), researchers such as Jean Pauphilet PhD '20 create analytical tools that address vital needs, from manufacturing to health care.

Prior to graduating, Pauphilet worked in the lab of Dimitris Bertsimas SM '87, PhD '88, the Boeing Leaders for Global Operations Professor of Management, which focuses on health care and the use of data to inform life-and-death decisions such as those related to staffing and treatment. In the era of Covid-19, speed and accuracy in medical decisions have never been more important.

ORC researchers like Pauphilet are at the vanguard of this fast-growing field. "Operations in practice are very messy, but I think that's what makes them exciting. You're never short on problems to solve," he says.

Building machine-learning models that are more reliable, understandable, and robust

The work of Aleksander Mądry SM '09, PhD '11, a professor of computer science, is fueled by one core mission: "doing machine learning the right way." Mądry's research centers largely on making machine learning more accurate, efficient, and robust against errors. In his classroom and beyond, he also worries about questions of ethical computing, as we approach an age where AI will have a great impact on many sectors of society.

"I want society to truly embrace machine learning," says Mądry. "To do that, we need to figure out how to train models that people can use safely, reliably, and in a way that they understand."

In the end, he aims to make each model's decisions more interpretable by humans, so researchers can peek inside to see where things went awry. At the same time, he wants to enable non-experts to deploy the improved models in the real world for, say, helping diagnose disease or control driverless cars.

Harnessing AI for stronger cybersecurity and improved global health

In the seemingly limitless field of AI applications, MIT researchers at the Laboratory for Information and Decision Systems (LIDS) are launching successful startups, and breaking new ground. Here are two examples:

- PatternEx was founded on a simple premise: robust cybersecurity does not depend on algorithms alone. Cofounder Kalyan Veeramachaneni, a principal research scientist at LIDS, and colleagues have created a closed-loop approach that isn't about "taking decisions away from humans" but blending the strengths of AI and human analysts to optimize both.
- At macro-eyes, Benjamin Fels and Suvrit Sra, the Esther and Harold E. Edgerton Career Development Associate Professor, are deploying AI for a different challenge: reducing vaccine-preventable childhood diseases in low-resource settings. By tackling a central problem—accurately predicting how many children come to scheduled appointments—they reduce vaccine shortages and wasted surplus. Success isn't measured merely in figures or doses, says Fels, but in human impact: "How many people did we help?"

A breakthrough in antibiotic development

As the world grapples with the growing threat of antibiotic resistance and the slow and costly process of developing new antibiotics, researchers at the Abdul Latif Jameel Clinic for Machine Learning in Health (Jameel Clinic) have developed a machine-learning tool that rapidly screens for new antibiotics.

The team, led by Jameel Clinic co-directors Regina Barzilay, the Delta Electronics Professor of Electrical Engineering and Computer Science, and James J. Collins, the Termeer Professor of Medical Engineering and Science, has developed the first algorithm to successfully identify a new antibiotic compound. The algorithm can screen over a hundred million compounds in a matter of days and pinpoint potential antibiotics that utilize different mechanisms than those of existing drugs.

In tests, the drug killed many virulent pathogens, including several antibiotic-resistant bacteria, and cleared infections in two mouse models. As Collins notes, "Our approach revealed this amazing molecule that is arguably one of the more powerful antibiotics that has been discovered."

U.S. AIR FORCE

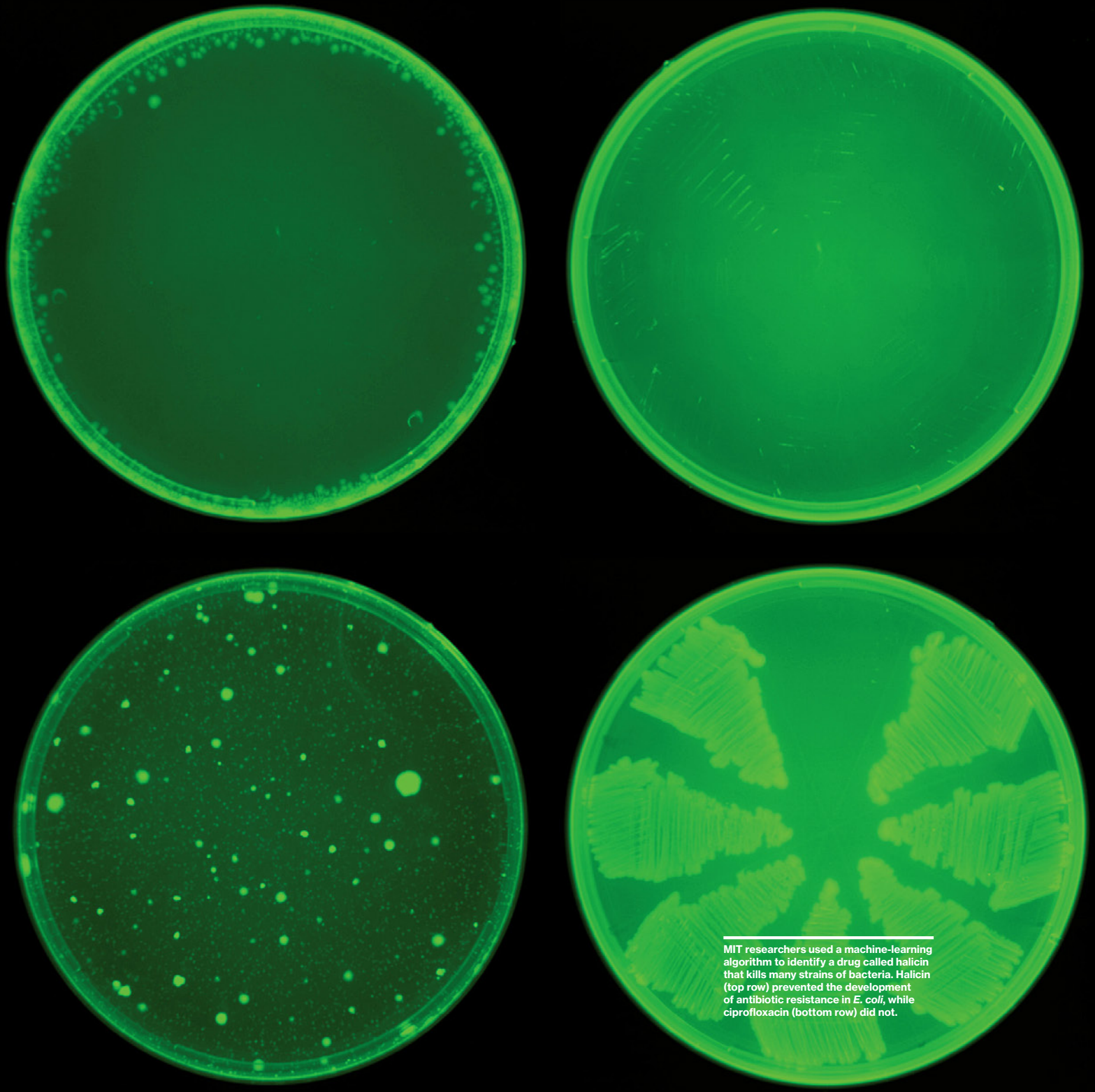
MIT-Air Force AI Innovation Accelerator focuses on innovations in operations, disaster response, and medical readiness

MIT and the US Air Force launched a new program designed to make fundamental advances in AI to improve Air Force operations and address broader societal needs.

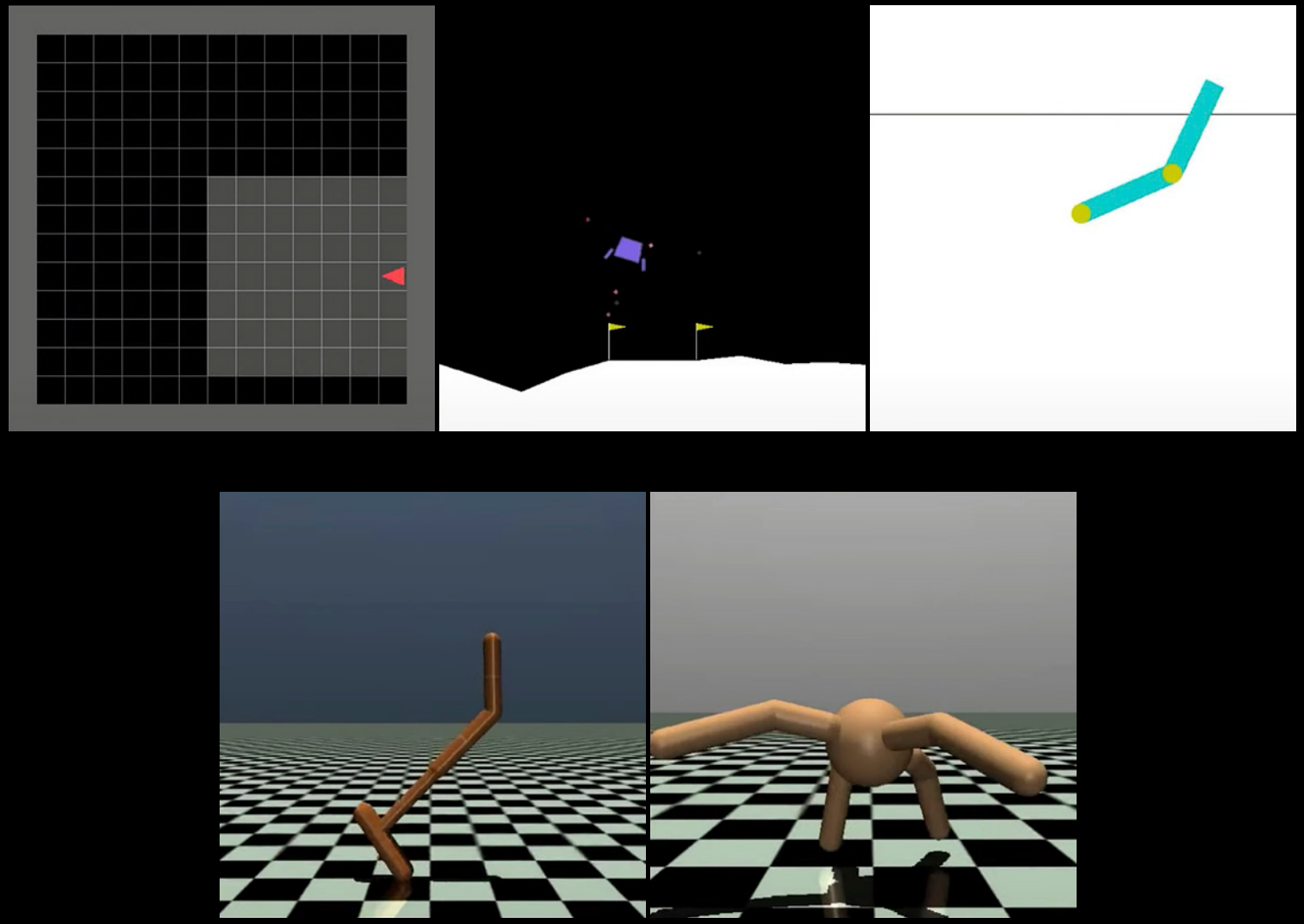
The effort, known as the MIT-Air Force AI Innovation Accelerator, is leveraging the expertise and resources of MIT and the Air Force to conduct fundamental research directed at enabling rapid prototyping, scaling, and application of AI algorithms and systems. The Air Force plans to invest approximately $15 million per year as it builds upon its five-decade relationship with MIT.

The collaboration, a component of the SCC, is expected to support at least 10 MIT research projects addressing challenges that are important to both the Air Force and society more broadly, such as disaster response and medical readiness.

Under the agreement, MIT is forming interdisciplinary teams of researchers, faculty, and students whose work focuses on topics in artificial intelligence, control theory, formal methods, machine learning, robotics, and perception, among other fields. Teams also include leaders in technology policy, history, and ethics from a range of departments, labs, and centers across the Institute. Members of the Air Force are lending expertise to each team.



MIT researchers used a machine-learning algorithm to identify a drug called halicin that kills many strains of bacteria. Halicin (top row) prevented the development of antibiotic resistance in *E. coli*, while ciprofloxacin (bottom row) did not.



MIT researchers used machine learning to find entirely new algorithms for encoding exploration. Their machine-designed algorithms outperformed human-designed algorithms on the wide range of simulated tasks and environments shown here.

New machine-learning model offers insights in health and energy use

CSAIL researcher Chen-Yu Hsu SM ’17, PhD ’20 and colleagues have developed a system that measures in-home appliance usage to better understand health tendencies. The system, called Sapple, analyzes appliance usage to understand health patterns using radio signals and a smart electricity meter.

By taking information from two sensors, this new machine-learning model can detect where and when every-day appliances such as microwaves, stoves, and hair dryers are being used. Potential applications include reducing in-person contact for high-risk populations while supporting health and safety—important in the time of Covid-19—and encouraging energy-saving behaviors.

Hsu notes that “indoor location sensing may soon be as common as Wi-Fi” and hopes that the technology can easily be deployed in “all places with utility meters,” creating many new applications for passive health sensing in the home.

Creating a curiosity-powered algorithm

Curiosity about the new is an essential trait that powers human learning and exploration. Computers, by contrast, are often stymied by new experiences. As part of MIT’s Quest for Intelligence, researchers at CSAIL and the Department of Electrical Engineering and Computer Science are pioneering a new approach: an algorithm powered by its own curiosity instinct.

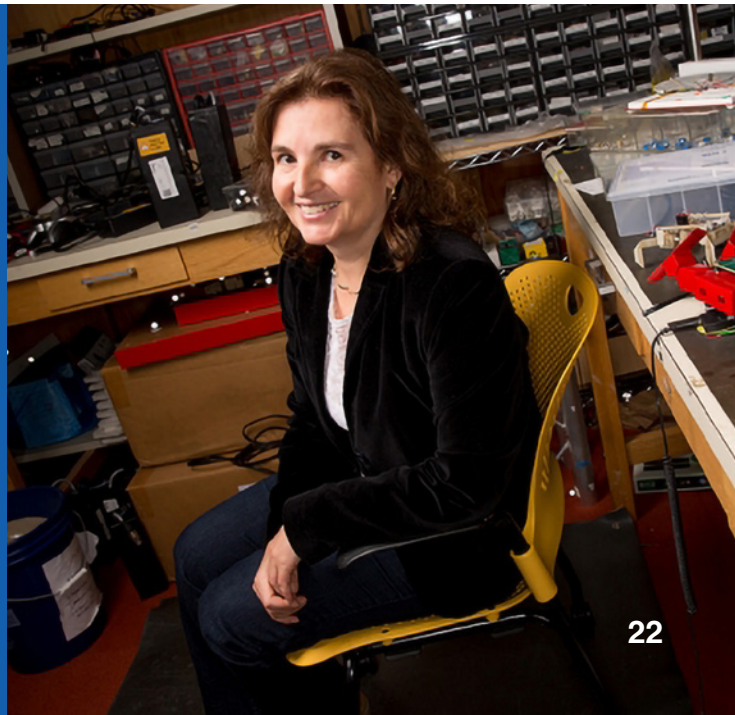
Their “meta-learning” algorithm generated 52,000 exploration algorithms of its own, including two that were entirely new—seemingly too obvious or counterintuitive for a human to have proposed.

“Algorithms designed by humans are very general,” says study co-author and PhD student Ferran Alet SM ’18. “We were inspired to use AI to find algorithms with curiosity strategies that can adapt to a range of environments.”

“The MIT Schwarzman College of Computing is giving our faculty increased opportunities for research collaboration in computing across campus. By involving colleagues from a broad range of departments and schools, the college is enabling faculty to impart new discoveries and knowledge to create innovations in the next generation of computing research.”

Daniela Rus

Deputy Dean of Research, SCC
Director, CSAIL
Andrew and Erna Viterbi Professor of Electrical Engineering and Computer Science



Spotlight on Covid-19

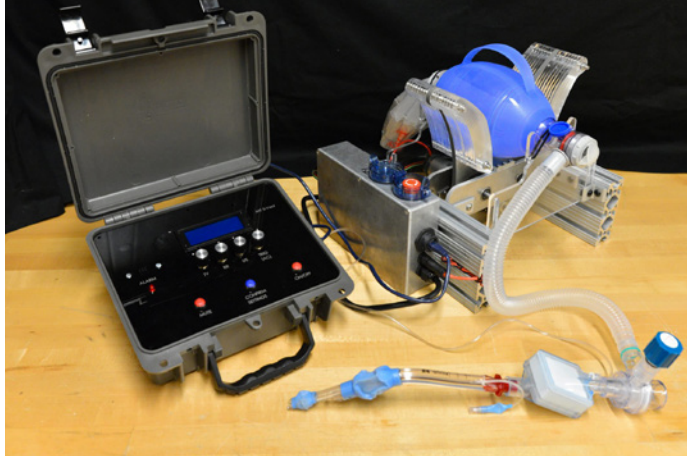
The Covid-19 crisis, along with many global, complex problems, underscores that the latest advances in computing and AI need to be broadly and deftly deployed to benefit our ways of life, including addressing pandemics and their economic and societal impacts, speeding up and improving drug delivery, and making health care more effective. Here are just some of the ways MIT and many of the college's labs, units, and centers are tackling this momentous public health challenge.

AI Cures collects data and builds partnerships in search for therapeutics

The pandemic has highlighted the urgent need for therapeutics against pathogens and health threats. While traditional drug-development approaches are expensive and time-consuming, AI tools can accelerate and transform this effort, enabling rapid, large-scale searches and identification of potential therapeutics.

AI Cures, an initiative housed at Jameel Clinic, is drawing together researchers in computational and life sciences from MIT and around the world to provide datasets, ways to frame machine-learning problems, and a platform for interdisciplinary collaboration.

As Regina Barzilay, the Delta Electronics Professor of Electrical Engineering and Computer Science and cofounder of Jameel Clinic and AI Cures, explains, "By openly sharing data, critical analysis, and methods, we hope to explore the many ways AI can help drug discovery."



A version of the MIT Emergency Ventilator.

A low-cost ventilator to save lives

One of the most pressing shortages facing hospitals during the Covid-19 crisis is a lack of ventilators, which can cost about $30,000 each. An MIT-based volunteer team of engineers, physicians, computer scientists, and other experts is working at top speed on a safe, inexpensive alternative for emergency use that could be assembled anywhere in the world. The key component: a hand-operated bag-valve resuscitator, or Ambu bag.

By making the MIT Emergency Ventilator project open source, with components freely available at e-vent.mit.edu, the team can "encourage capable clinical-engineering teams to work with their local resources," while prioritizing patient safety.

Team members anticipate that input from external partners will strengthen the technology and speed progress. As one researcher noted, "We all work together, and ultimately the goal is to help people, because people's lives understandably hang in the balance."

IDSS navigates Covid-19 with the MIT Isolat collaborative

As the Covid-19 crisis unfolded, the Institute for Data, Systems, and Society (IDSS) formed a volunteer research group, Isolat, that provides analysis of pandemic-related data to help policy makers at MIT and beyond make informed decisions. Isolat members include faculty, students, and researchers from a number of departments and research centers—many housed in the Schwarzman College—as well as global partners. They represent disciplines from statistics and epidemiology to data modeling and public health policy.

Munther Dahleh, IDSS director and professor of electrical engineering and computer science, describes Isolat's driving force as "our community's sense of social responsibility." Isolat applies the full force of MIT's expertise to Covid-19. "Everybody throws their contribution into the ring," says Anette "Peko" Hosoi, an IDSS affiliate who is the Neil and Jane Pappalardo Professor of Mechanical Engineering and associate dean of engineering, because "[we] need answers today."

MIT-IBM Watson AI Lab funds 10 AI research projects aimed at the pandemic

Artificial intelligence could play a decisive role in stopping the Covid-19 pandemic. To give the technology a push, the MIT-IBM Watson AI Lab is funding 10 MIT projects aimed at advancing AI's transformative potential for society. The research will target immediate public health and economic challenges and could have a lasting impact on how we evaluate and respond to risk in the future.

These diverse projects include economic modeling of the effects of targeted lockdowns on the economy and public health; evaluating the efficacy of mask materials in protecting wearers and people around them; creating 3-D models of molecules to help identify the most promising therapeutics; and statistical models to evaluate tradeoffs in scaling the manufacture and supply of vaccine candidates.

CSAIL robot disinfects Greater Boston Food Bank

Across the globe, cleaning workers in warehouses, grocery stores, schools, and other spaces face serious risks of Covid-19. To improve worker safety and reduce the risks and costs of cleaning, a CSAIL research team, in collaboration with Ava Robotics and the Greater Boston Food Bank (GBFB), designed a new robotic system utilizing UV-C light, that rapidly disinfects surfaces and neutralizes aerosolized forms of the virus.

"Food banks provide an essential service to our communities, so it is critical to help keep these operations running," says Alyssa Pierson, CSAIL research scientist and technical lead of the UV-C lamp assembly. "Here, there was a unique opportunity to provide additional disinfecting power to GBFB's workflow and help reduce the risks of Covid-19 exposure."

Device lets doctors monitor Covid-19 patients from a distance

Even with the best protocols in place, treating Covid-19 patients is inherently dangerous for health professionals. But what if there was a way to monitor patients from a safe distance?

A clinical team in Boston reported being able to monitor a Covid-19 patient remotely, thanks to a device developed at CSAIL that can monitor a patient's breathing, movement, and sleep patterns using wireless signals. The CSAIL team's device, which they call "Emerald," has been used in multiple hospitals and assistive-care facilities.

Developed by MIT professor Dina Katabi, the Andrew and Erna Viterbi Professor of Electrical Engineering and Computer Science, and her research group at CSAIL, Emerald is a Wi-Fi-like box that analyzes the wireless signals in the environment using AI to infer people's vital signs, sleep, and movement.

Emerald can generate important health data without any patient contact and minimize the risk that doctors and nurses will catch Covid-19 from their patients. Emerald could also help detect other respiratory problems that would otherwise go unnoticed.

Hot Topics in Computing

This virtual event series, launched by CSAIL, explored a wide range of contemporary topics in data science and computing, with guests from MIT and beyond. Here are a few examples.

Professor Michael Z. Lin explores the basic biology behind the epidemic

On March 20, 2020, Stanford associate professor Michael Z. Lin offered a look at the basic biology of coronaviruses and the disease Covid-19 and discussed projections for the pandemic. He also provided an overview of medications for Covid-19 that are currently in clinical trials.

Using computing to address the social impacts of Covid-19, with MIT's Julie Shah

On April 14, 2020, Julie Shah, social and ethical responsibilities of computing associate dean at the Schwarzman College, discussed opportunities for addressing the societal challenges wrought by Covid-19 by using data and computing power. She also offered guidance and information for those interested in joining some of the many ongoing research collaborations at MIT.

An in-depth conversation with Microsoft President Brad Smith

On May 14, 2020, SCC Dean Daniel Huttenlocher welcomed Microsoft President Brad Smith for a virtual fireside chat with Daniela Rus, SCC deputy dean for research. The conversation spanned a wide range of topics in the world of data and computing, from climate change and global health threats like the Covid-19 pandemic, to cybersecurity, online voting, and the work of the future.

Undergraduates from around the world collaborate and experiment at the annual HackMIT event.

Community Highlights

With the foundation and the programmatic and organizational framework of the MIT Schwarzman College of Computing now in place, a clear picture of the college's community has begun to emerge: world-class researchers working at the forefront of computing research and at the nexus of computing and other disciplines, students channeling their passion for computer science and AI into solving the world's biggest challenges, and a collective effort to advance the role of computing in progress toward a more equitable society.

By creating new faculty positions, MIT is accelerating computing education and research across all disciplines.

Faculty

The college has begun to fulfill its commitment to creating 50 new faculty positions: 25 located within the college and 25 shared with other academic departments across MIT. Building on the history of strong faculty participation in interdepartmental labs, centers, and initiatives, the SCC provides several forms of faculty membership based on teaching, cross-cutting research, or external engagement activities. Leveraging existing faculty collaborations across schools and departments and creating opportunities for new collaborations are at the core of the college's mission.

Shared Faculty Hiring Areas

In coordination with the provost and the five schools, and with input from departments across the Institute, the SCC identified six key areas for hiring 25 faculty positions shared between the college and a department or school. The shared faculty members are expected to engage in teaching and research that contribute to their home department, are of mutual value to that department and the college, and help form and strengthen cross-departmental ties.

- **Social, Economic, and Ethical Implications of Computing and Networks**

  School of Humanities, Arts, and Social Sciences, MIT Sloan School of Management

  This area will include faculty whose work focuses on the broader consequences of the changing digital and information environment, market design, digital commerce and competition, and economic and social networks.

- **Computing and Natural Intelligence: Cognition, Perception, and Language**

  School of Science, School of Humanities, Arts, and Social Sciences, School of Architecture and Planning

  Integrating science, computing, and social sciences and humanities, this area aims to address the gap between the science and engineering of intelligence in order to make transformative advances in AI and deepen our understanding of natural intelligence.

- **Computing in Health and Life Sciences**

  School of Engineering, School of Science, MIT Sloan School of Management

  This area aims to hire faculty to help create transformative new computational methods in health and life sciences while at the same time complementing the considerable existing work at MIT by forging additional connections. Its broad scope ranges from computational approaches to fundamental problems in molecular design and synthesis for human health, to reshaping health care delivery and personalized medicine, to understanding radiation effects and optimizing dose delivery on target cells, to improving tracing, imaging, and diagnostic techniques.

- **Computing for Health of the Planet**

  School of Engineering, School of Science, School of Architecture and Planning

  This area brings together interdisciplinary expertise that will enable us to advance physical understanding of low-carbon energy solutions, earth-climate modeling, and urban planning through high-performance computing, transformational numerical methods, and/or machine-learning techniques.

- **Computing and Human Experience**

  School of Humanities, Arts, and Social Sciences, School of Architecture and Planning

  This area focuses on educating scholars in the social sciences, humanities, and computing who examine technology designs, systems, policies, and practices that can address the lack of understanding of advanced technologies and their implications, including the design of systems that may help ameliorate rather than exacerbate inequalities. It further aims to develop techniques and systems that help people interpret and gain understanding from societal and historical data, including in humanities disciplines such as comparative literature, history, and art and architectural history.

- **Quantum Computing**

  School of Engineering, School of Science

  In the coming years, new hardware, algorithms, and discoveries promise to dramatically increase the power of quantum computers far beyond current machines. This area aims to catalyze education and research in quantum computing and quantum information across the Institute.

New and Incoming Faculty

Thirteen new faculty focused on computing and related areas have either recently started or have accepted a position at MIT. The cohort spans faculty lines located both within the college and in other academic departments across MIT. Among the new faculty members are 12 from the Department of Electrical Engineering and Computer Science (EECS), which jointly reports into the School of Engineering and the MIT Schwarzman College of Computing.

YuFeng (Kevin) Chen, the D. Reid Weedon Jr. '41 Career Development Assistant Professor, joined EECS in January 2020 as part of the Electrical Engineering (EE) Faculty and the Artificial Intelligence and Decision Making (AI+D) Faculty. He is also a member of the MIT Research Laboratory of Electronics and the MIT Microsystems Technology Laboratories. His work focuses on developing insect-scale robots capable of locomotion and transition between air, land, and water.

Henry Corrigan-Gibbs* joined MIT as an assistant professor in EECS in July 2020. He is also a member of the Computer Science and Artificial Intelligence Laboratory (CSAIL). Corrigan-Gibbs's research interests are in computer security, applied cryptography, and online privacy. Prior to MIT, his projects included new techniques for reducing the computational cost of private information retrieval and a system for the privacy-preserving collection of aggregate statistics.

Marzyeh Ghassemi PhD '17 will join MIT as an assistant professor in EECS in July 2021 and will also be affiliated with the Institute for Medical Engineering and Science and CSAIL. Her research focuses on machine learning in health care. Ghassemi is working on clinical risk prediction with semi-supervised learning; optimal treatment discovery using expert demonstrations; and noninvasive patient phenotyping for behavioral conditions.

Dylan Hadfield-Menell '12, SM '13* will join MIT as an assistant professor in EECS in July 2021 and will also be a member of CSAIL. His research focuses on algorithms that facilitate human-compatible artificial intelligence. He aims to develop frameworks that account for uncertainty about the objective being optimized. Hadfield-Menell is a fourth-year PhD student at the University of California, Berkeley.

Sam Hopkins* will join MIT as an assistant professor in EECS in January 2022 and will also be a member of CSAIL. His research focuses on optimization, especially convex programming and its applications to algorithmic statistics. Hopkins is currently a Miller Postdoctoral Fellow in electrical engineering and computer science at the University of California, Berkeley.

Yoon Kim* will join MIT as an assistant professor in EECS in 2021 and will also be a member of CSAIL. He is currently a research scientist in the MIT-IBM Watson AI Lab. Kim's work is at the intersection of natural language processing and machine learning. He completed his PhD in computer science at Harvard University.

Anand Natarajan PhD '18* joined MIT as an assistant professor in EECS in September 2020 and is also a member of CSAIL. His research is in theoretical quantum information. Natarajan is particularly interested in nonlocality, quantum complexity theory, and semidefinite programming hierarchies.

Jelena Notaros SM '17, PhD '20 joined MIT as an assistant professor in EECS, a principal investigator in the MIT Research Laboratory of Electronics, and a core faculty member of the MIT Microsystems Technology Laboratories in May 2020. Her research interests are in integrated silicon photonics devices, systems, and applications, with an emphasis on integrated optical phased arrays for LiDAR (light detection and ranging) and augmented reality.

Jonathan Ragan-Kelley SM '07, PhD '14,* the Edgerton Career Development Assistant Professor in EECS, joined MIT in January 2020. He is also a member of CSAIL. Ragan-Kelley's work encompasses high-efficiency visual computing, including systems, compilers, and architectures for image processing and vision, 3-D graphics, and machine learning.

Ashia Wilson* will join MIT as assistant professor in EECS in January 2021 and will be a member of the Laboratory for Information and Decision Systems. Her research interests are in providing rigorous guarantees for algorithmic performance and in developing frameworks for studying issues of fairness and governance in machine learning.

Mengjia Yan,* the Homer A. Burnell Career Development Professor, joined MIT as an assistant professor in EECS in November 2019. She is also a member of CSAIL. Yan's research focuses on hardware support for security, and she is interested in developing efficient defense and detection approaches against covert side-channel attacks.

Guangyu Robert Yang will join MIT as an assistant professor in July 2021. Yang will be based in the Department of Brain and Cognitive Sciences and will be assuming a shared position with the SCC in AI+D. Yang's interests are in understanding the brain and building neural networks. He is currently a postdoctoral researcher with the Center for Theoretical Neuroscience at Columbia University.

Sixian You will join MIT as an assistant professor in EECS in January 2021. She will be part of the EE Faculty. You's primary research interest is in developing innovative optical imaging solutions for biomedicine. She is particularly interested in next-generation, label-free multiphoton imaging technologies to study the tumor microenvironment.

**Indicates faculty in core computing positions located within the college.*

First Named Professorships

The college appointed its first two named professorships, beginning July 1, 2020, to **Frédo Durand** and **Samuel Madden** in EECS. These named positions recognize the faculty members' outstanding achievements and future career potential.

Frédo Durand, a professor of computer science and engineering in EECS, is the inaugural Amar Bose Professor of Computing. The professorship, named after Amar G. Bose '51, SM '52, ScD '56, former longtime member of the MIT faculty and the founder of Bose Corporation, is granted in recognition of the recipient's excellence in teaching, research, and mentorship in the field of computing. A member of CSAIL, Durand's research interests span most aspects of picture generation and creation, including rendering and computational photography. His recent focus includes video magnification for revealing the invisible, differentiable rendering, and compilers for productive, high-performance imaging.

Samuel Madden '99, SM '99 is the inaugural College of Computing Distinguished Professor of Computing. A professor of electrical engineering and computer science in EECS, Madden is being honored as an outstanding faculty member who is recognized as a leader and innovator. His research is in the area of database systems, focusing on database analytics and query processing, ranging from clouds to sensors to modern high-performance server architectures. He co-directs the Data Systems for AI Lab initiative and the Data Systems Group, investigating issues related to systems and algorithms for data focusing on new methodologies for processing data, including applying machine-learning methods to data systems and engineering data systems for applying machine learning at scale.

"Not only will the outstanding scholars who are filling, and will fill, the college's new faculty positions ensure we learn exciting new things about how to apply computational tools to disciplines across campus, we fully expect that knowledge will flow back and inform the next generation of computing research."

Martin A. Schmidt SM '83, PhD '88

MIT Provost

Ray and Maria Stata Professor of Computer Science and Engineering

Students

The college is putting structures and programs in place to benefit students in a way that sets it apart in the academic landscape. Many MIT students have passions beyond computer science but recognize the need to be adept in computing techniques and methodologies to pursue other interests, whether they be political science, economics, or urban science. The SCC is both strengthening the computing fields at MIT and more effectively and creatively connecting AI and computing to every discipline on campus.

45%

of **undergraduates** at MIT majoring in EECS and blended computing majors

Students Find Applications for Next-Generation Computing

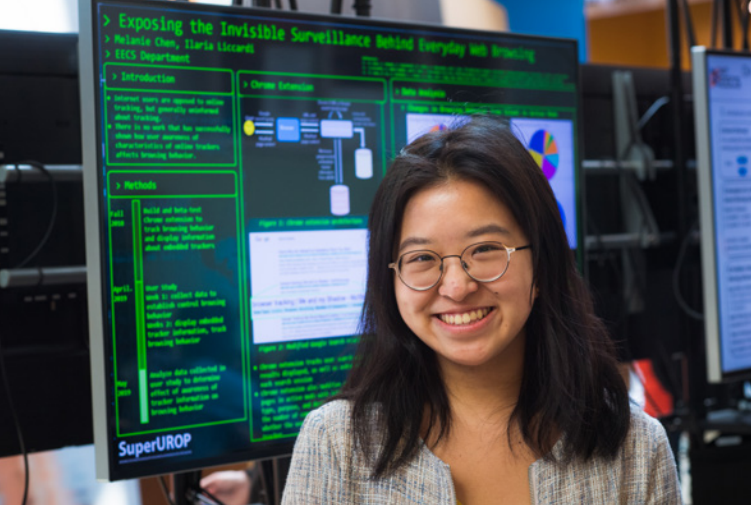
Undergraduates and graduate students from disciplines across the Institute are exploring the applications of advanced computing tools in health care, language, nuclear engineering, and more.

- **A more efficient nuclear reactor**

  In an Undergraduate Research Opportunities Program (UROP) project with Josh Joseph SM ’08, PhD ’14, an AI engineer at the MIT Quest for Intelligence (MIT Quest), and Koroush Shirvan SM ’10, PhD ’13, an assistant professor in the Department of Nuclear Science and Engineering, computer science and engineering major **Isaac Wolverton ’21** spent the past academic year training a reinforcement learning agent to find the best way to lay out fuel rods in a reactor core. To simulate the process, he turned the problem into a game, borrowing a machine-learning technique for producing agents with superhuman abilities at chess and Go. “Nuclear power emits very little carbon and is surprisingly safe compared to other energy sources, even solar or wind,” says Wolverton. “We wanted to see if we could use AI to make it more efficient.”

- **Unearthing language’s hidden constraints**

  Recent Course 6-7 Computer Science and Molecular Biology graduate **Karen Gu ’20** put language under the microscope for her UROP experience, funded by MIT Quest. Working with Roger Levy, an associate professor in MIT’s Department of Brain and Cognitive Sciences, and postdoc M. H. Tessler, Gu built a model to explain how, word by word, a given sentence produces meaning. She then ran a set of online experiments to see how human subjects would interpret analogous sentences in a story. Her experiments, she says, largely validated intuitions from linguistic theory. “I’m fascinated by the complex and subtle things that we do to constrain language understanding, almost all of it subconsciously,” says Gu.



Left: Melanie Chen '20 presents her SuperUROP project, Exposing the Invisible Surveillance Behind Every Day, Web-Browsing Activities, at the 2019 SuperUROP Showcase poster session. For her project, Chen worked on building a tool that would reveal to users what sorts of metadata a website would collect from them and conducted experiments to examine how this awareness of surveillance affects browsing habits. Right: EECS PhD candidate Harini Suresh '16, MNG '17 speaks at an MIT Campaign for a Better World event in Atlanta in 2019.

■ **Improving donor liver availability**

In a collaboration with Massachusetts General Hospital, MIT Quest is evaluating whether automation could help boost the nation's supply of viable livers, many of which are discarded before they make it to patients because there aren't enough doctors to review tissue samples. This loss represents a huge opportunity for machine learning, according to electrical engineering and computer science major **Kuan Wei Huang '21**. Huang joined a UROP that is training a deep neural network to pick out globules of fat on liver tissue slides to estimate the liver's overall fat content (if it's low enough, the liver is deemed viable for transplant). "Using machine learning to address medical problems is one of the best ways that a computer scientist can impact the world," says Huang.

■ **Modeling German language acquisition**

To understand and replicate human intelligence, we must better understand the cognitive computation underpinning language. Without the operation Merge, which builds hierarchical trees out of two syntactic elements, we would not be able to build complex descriptions of the world. **Annika Heuser '21**, who is majoring in Course 6-9 Computation and Cognition, built a computational model of Merge for her Advanced Undergraduate Research Opportunities Program (SuperUROP) project to learn more about this critical operation. Her programmed model uses its Merge function in exactly the same way to return hierarchical trees for both English and German sentences. "I participated in SuperUROP because I realize that my research will not make a difference unless I can clearly communicate about it," says Heuser. "I gained valuable insight about the research process from playing a large role in the design of my project."

"The college is offering new incentives and opportunities to develop the computer science field—and computing applications in many different fields—thoughtfully and responsibly. MIT has a lot of influence, and we can demonstrate that it is both important and possible to commit time, space, and resources to teaching and researching computing in a way that incorporates ethical and societal considerations."

Harini Suresh '16, MNG '17 *is a doctoral candidate in computer science in EECS. Her research centers on the societal implications of machine learning, including deep-learning approaches to machine-guided medical decision making. Her goal is to make these automated systems easier to understand and to use responsibly.*

“Researchers and students at MIT are getting concrete opportunities to accelerate research in artificial intelligence and machine learning by drawing together individuals from diverse disciplines, such as health care and computer science.”

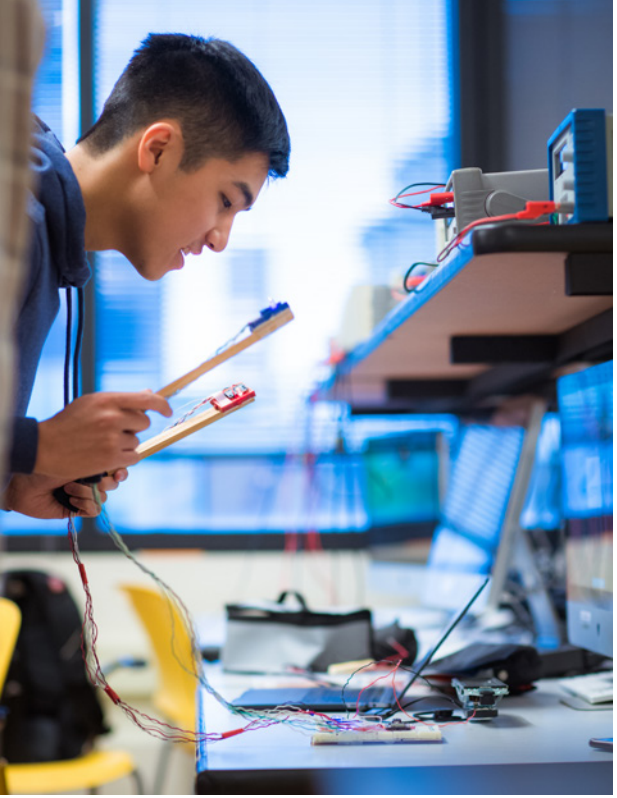
Mattie F. Wasiak ’20, MNG ’20 *is a master’s candidate in computer science with an artificial intelligence concentration. She is applying machine learning and statistical techniques to challenges such as optimization of patient care in neonatal intensive care units, detection of employer bias in job postings, and the improvement of patient outcomes in sepsis and hypertension.*

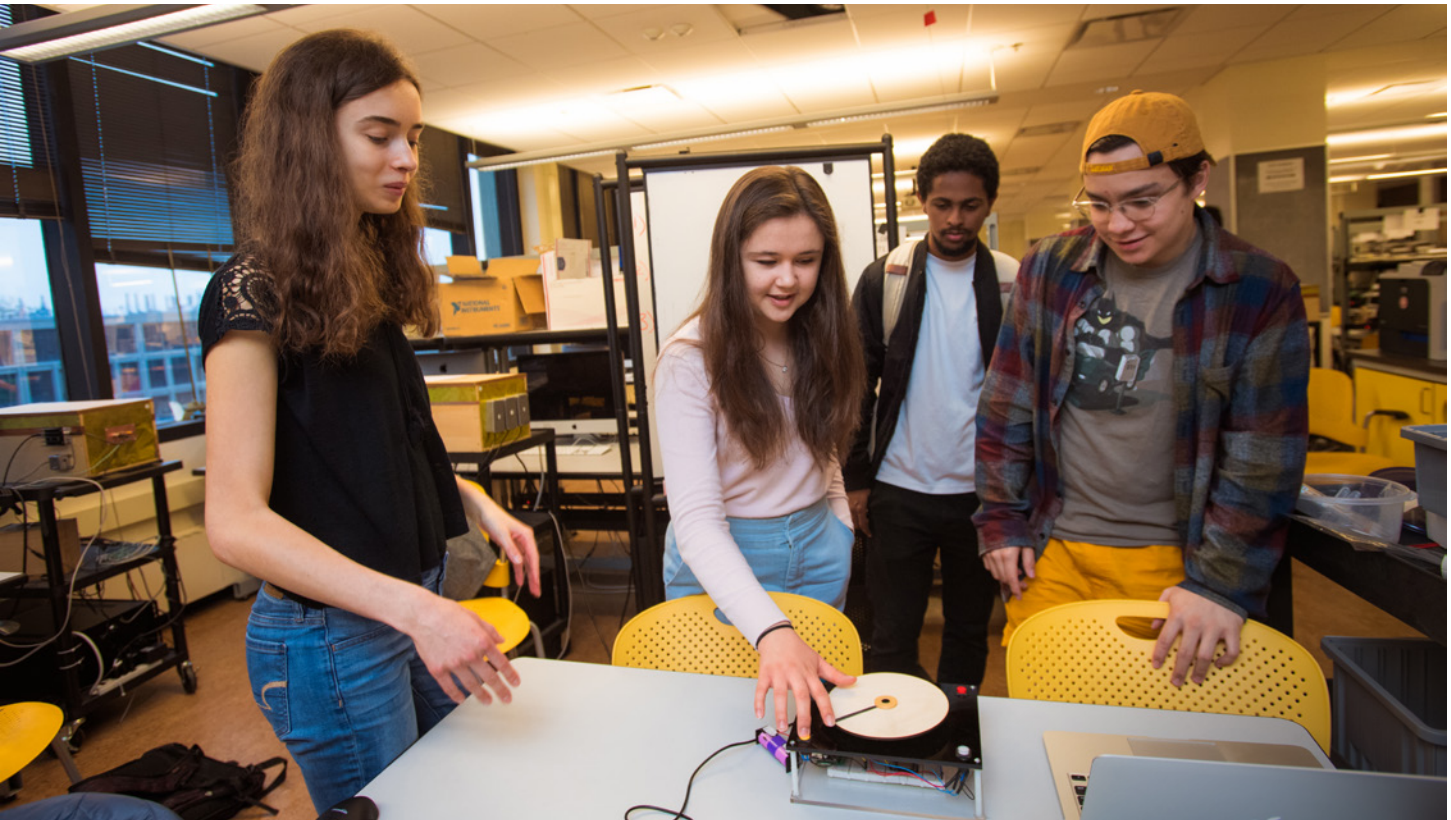
- **Helping people with severe motor impairments communicate**

  Electrical engineering and computer science major **Nicholas Bonaker ’21** spent a year working on Nomon, keyboard software aimed at people living with severe motor impairments. For these individuals, computer interaction is limited to a single switch, a button press, or a puff of air. Nomon uses machine learning to adapt to users’ abilities and allows them to type quickly and accurately. Through SuperUROP, Bonaker—who also received funding from MIT Quest—conducted a longitudinal study that followed able-bodied individuals as they learned to use Nomon with a switch designed for people with motor impairments. His goal was determining how well Nomon works as a method of communication. “I am excited to see our software in action and perhaps make a difference by helping people living with severe motor impairments communicate more effectively,” says Bonaker.

- **Natural language processing for clinical care**

  Geeticka Chauan SM ’19, an EECS PhD student and council president of Sidney-Pacific, MIT’s largest graduate residence, works in the Clinical Decision Making Group at CSAIL, where she focuses on the ways natural language processing can address health care problems. For her master’s in 2019, she worked on the problem of relation extraction and built a tool to digest clinical literature that would, for example, help pharmacologists easily assess negative drug interactions. Now, she’s finishing up a project integrating visual analysis of chest radiographs and textual analysis of radiology reports for quantifying pulmonary edema, to help clinicians manage the fluid status of patients who have suffered acute heart failure. “In routine clinical practice, patient care is interwoven with a lot of bureaucratic work,” Chauan says. “The goal of my lab is to assist with clinical decision making and give clinicians the full freedom and time to devote to patient care.”





Students showcase their final assignments for the course 6.08 Introduction to EECS via Interconnected Embedded Systems, which introduces students to working with multiple platforms, servers, databases, and microcontrollers.

Students, alumni, and others participate in Reality Hack, an XR (extended reality) hackathon held annually at MIT co-hosted by a team of student volunteers. The event provides participants with tools and knowledge to create an immersive experience, game, or app.

- **Better data visualizations**

  Location-tagged data are widely available but often underutilized by urban planners and policy makers. **Avital Vainberg ’21** participated in a SuperUROP to put such data to better use by developing visualizations that are accessible to nontechnical audiences. Vainberg, who is majoring in Course 11-6 Urban Science and Planning with Computer Science, used travel survey data from Singapore to develop an interactive dashboard. “The goal is to inform planners and policy makers of where, when, and why people are traveling in order to encourage better decisions regarding land use, zoning, and transportation infrastructure. This project simultaneously sharpened my coding and data science skills, pushed me to think critically of the world around me, and encouraged me to take on impactful projects,” Vainberg says.

- **Software for speech diagnosis**

  Christine Soh ’20 recently graduated with a double major in computer science and linguistics, which she paired to explore research combining the two disciplines. Through SuperUROP, Soh got the chance to investigate whether speech analysis software can be used as a tool for the clinical diagnosis of speech impairments. “It’s very difficult to correctly diagnose a child because a speech impairment can be caused by a ton of different things,” says Soh. Working with the Speech Communication Group in MIT’s Research Laboratory of Electronics, Soh developed a tool that can listen to a child’s speech and extract linguistic information, such as where in the mouth the sound was produced, thus identifying modifications from the proper formation of the word. “We can then use computational techniques to see if there are patterns to the modifications that have been made and see if these patterns can distinguish one underlying condition from another,” she says.

314

undergraduates across four blended majors:

- 6–7 Computer Science and Molecular Biology
- 6–9 Computation and Cognition
- 6–14 Computer Science, Economics, and Data Science
- 11–6 Urban Science and Planning with Computer Science

Undergraduate Student Advisory Group

Over the course of the year, the Schwarzman College of Computing Undergraduate Student Advisory Group provided feedback to college leadership that has helped guide decisions about the undergraduate experience, with a special emphasis on the Common Ground for Computing Education. Made up of a cross-section of students, from a range of backgrounds, in traditional and blended EECS majors and other computing-related majors, the group formed and began meeting on a monthly basis in spring 2020. It is led by Schwarzman College Dean Daniel Huttenlocher, Deputy Dean of Academics Asu Ozdaglar, and student chair Marla Evelyn ’21, who is majoring in Course 6–14 Computer Science, Economics, and Data Science.

Diversity, Equity, and Inclusion

Developing leaders who will offer the world new technological possibilities grounded in human values starts with a learning and research community that values and supports all of its members, regardless of race, gender, or identity. Units across the college are engaging in activities aimed at improving the climate for underrepresented groups. These actions, which align with those of the larger MIT community, are important early steps toward a more equitable and welcoming place to thrive.

41%

of current MIT Quest for Intelligence research projects were awarded to **female researchers**

Voices and Action in SCC Departments and Centers

The college, in partnership and collaboratively with its academic units, labs, and centers, is actively working to address racism and to advance diversity, equity, and inclusion. Since its inception, the college has been focusing on improving diversity in faculty recruiting and is developing additional plans for graduate admissions and for improving the culture and climate in the college, in conjunction with the rest of MIT. Here are some examples of how individual units of the college are engaging in listening, learning, and action.

- EECS has spearheaded several initiatives to increase women's participation in academia and STEM fields, including Rising Stars in EECS and the Women's Technology Program. Furthermore, EECS is also involved in a range of efforts to improve computing opportunities for people from other underrepresented groups. In June 2020, the department hosted the EECS Listen-In for #ShutDownAcademia #ShutDownSTEM, which provided an opportunity for community members to have a frank discussion about identifying and ending systemic racism within the unit and at MIT more broadly. The listen-in helped inform department leadership as well as the ongoing work of the EECS Committee on Diversity and Inclusion.
- CSAIL undertook a range of activities, including mentoring a Martin Luther King Jr. Scholar; starting a women in technology initiative, with student mentorship provided by CSAIL director Daniela Rus; hosting the first-ever TEDxMIT featuring an all-female lineup; and working with MIT's Title IX director to organize workshops and trainings focused on an inclusive lab culture.
- IDSS also hosted a #ShutDownAcademia #ShutDownSTEM event for its community, which includes the Laboratory for Information and Decision Systems, the Technology and Policy Program, and the Sociotechnical Systems Research Center, and has formed a Task Force on Structural Racism.
- The Center for Computational Science and Engineering (CCSE) published a statement on the role of diversity within the center and hosted a listen-in for students in June 2020 to discuss their experiences and responses to systemic racism. CCSE faculty and students are also engaged with the MIT Summer Research Program and the University Center for Exemplary Mentoring. CCSE students and staff participated in MIT's Day of Dialogue, including facilitating a student-led small group workshop.
- The MIT-IBM Watson AI Lab and EECS are working with IBM to develop mentorship activities for underrepresented minority graduate students in EECS.

Students gather for the 2019 SuperUROP Showcase.

Claude M. Steele: The Science of Diverse Communities

On June 24, 2020, the college hosted American social psychologist and Stanford professor of psychology Claude M. Steele for a virtual talk on the science of diverse communities, followed by Q&A moderated by SCC Dean Daniel Huttenlocher. Drawing on stereotype threat and social identity threat research, Steele's talk addressed the why, what, and how of diverse learning communities: why they are important, a working hypothesis about what is critical to their success, and what research reveals about how to achieve that success.

"Stereotype threat can characterize the tensions that we experience in our institutions, in our organizations, in our classrooms, and in our conversations. This is what part of the challenge is, this is our history. It's in our lives," commented Steele at the beginning of the talk.

"[The] institutional approach of structuring and supporting people and encouraging their potential is something that almost the definition of our institutions hasn't led us to think is necessary," Steele said. "It is necessary—because of the diversity of the population that we want our institutions to serve now ... and because of the history of our nation and the nature of our culture and society. It's a part of our role as teachers, as conveyors of knowledge."

Ultimately, Steele noted, "the critical ingredient is trust. That is something that everybody can participate in building if we recognize its importance."


MIT
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College of
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An Interdisciplinary Computing Hub

The MIT Schwarzman College of Computing is looking ahead to another milestone: a new building on the MIT campus to call home.

Scheduled for completion in summer 2023, the building will provide state-of-the-art space for computing education and research. It will also serve as a nexus for interdisciplinary work, engaging computer scientists as well as faculty and students in sciences and engineering, architecture and urban planning, business management, and the humanities and the arts. The building is being designed by Skidmore Owings & Merrill, a firm that has created some of the most technically and environmentally advanced buildings in the world.

Located on Vassar Street, the building will link the MIT campus to vibrant Kendall Square, drawing thought leaders from academia, business, government, and the nonprofit sector. It will also encourage collaboration and breakthroughs within the Institute; for example, SCC faculty working on human intelligence and machine intelligence will now be next door to Building 46, home to the Department of Brain and Cognitive Sciences, the Picower Institute for Learning and Memory, and the McGovern Institute for Brain Research.

The SCC's new building will be a welcoming home for the next generation of MIT leaders in computing and AI, helping to share the college's exciting work with a global audience and opening the SCC to the world.

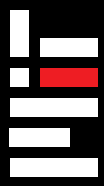
Conceptual rendering of the Schwarzman College of Computing building, which is being designed by the well-known architectural firm Skidmore Owings & Merrill.

The Schwarzman College of Computing building, located on Vassar Street at the heart of MIT's campus, will also serve as a nexus for interdisciplinary work, engaging computer scientists as well as faculty and students in sciences and engineering, architecture and urban planning, business management, and the humanities and the arts.

Thank You

We are grateful to everyone across campus and to the generous alumni and friends in the MIT community who are making the MIT Stephen A. Schwarzman College of Computing a reality. You have built a strong foundation on which the college—and the entire Institute—will grow in strength and innovative spirit. Thank you for your visionary support.


MIT Schwarzman
College of Computing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