

Program in Media Arts and Sciences

Graduate Program

A total of 162 students—65 master’s candidates and 97 doctoral candidates—were enrolled in the [Program in Media Arts and Sciences \(MAS\)](#) graduate program during academic year 2021. In addition to supervising MAS graduate students, MAS faculty and research staff collectively advised and supported more than 47 graduate students from other departments, including Biological Engineering, Brain and Cognitive Sciences, Physics, Electrical Engineering and Computer Science, Mechanical Engineering, Aeronautics and Astronautics, Integrated Design and Management, and Microbiology. Faculty also supervised students from the Harvard-MIT Division of Health Sciences and Technology.

MAS offered 41 graduate courses and two undergraduate courses during AY2021. The MAS graduate student community included 58 women, 76 international students, and 16 students from underrepresented minority groups. During the year, 60 advanced degrees were awarded (40 master’s degrees and 20 doctorates).

MAS received 1,149 master’s applications and admitted 38 new master’s students, a 3.3% admissions rate. Thirty-two students are expected to enroll, an 84% yield.

Online Teaching and Learning

During fall 2020, spring 2021, and summer 2021, MAS continued to operate entirely online and offered all courses and seminars through synchronous digital formats. Courses used a wide variety of platforms and formats, ranging from MIT’s Canvas learning management system to completely self-designed tools. In addition to maintaining a full MAS course portfolio, a new onboarding course (MAS.S90) was created to better support incoming students during the pandemic. Based on positive feedback, the course will continue to be offered in AY2022. In addition, MAS supported the annual Media Lab Festival of Learning, which took place entirely online this year, to support collaboration and connection across our dispersed community. MAS continues to work closely with the Digital Learning and Collaboration Studio on the design and implementation of Media Lab online learning efforts.

Diversity and Student Support

MIT Summer Research Program

The MIT Summer Research Program (MSRP) brings together undergraduate students from across the United States to conduct research at MIT for nine weeks over the summer. In addition to gaining research experience, interns learn about applying to and succeeding in graduate school. The program was held virtually this year due to the ongoing pandemic.

During the past summer, MAS hosted two MSRP interns in the Biomechanics research group.

- Christopher Shallal: Optimization and Parameterization of Soleus Muscle Activation Signals During Powered Plantarflexion for Restoring Symmetric Gait in AMI
- Angel Bu: Optimizing a Neuromuscular Model

Open House

Converted to a virtual format this year, the MAS Open House allowed prospective students to learn more about the Media Lab, meet with faculty and graduate students, and determine if this is the best program for them. Hosting virtually allowed for an increase in participants, as 347 people registered from around the world.

Virtual Visits

This MAS recruitment series continued to reach applicants who cannot visit the Lab in person. Six faculty members participated in the virtual visits to share information about their research groups with prospective students. Overall, there were 240 registered participants across all sessions.

Students Offering Support

The Students Offering Support (SOS) Program pairs applicants with current students who provide feedback on either the applicant's statement of purpose or portfolio. Because MAS research groups vary so much in the skills and experiences they are looking for, this individualized attention goes a long way in helping applicants understand what to highlight in their applications. This year, 37 applicants were paired with 21 volunteers from 10 different research groups.

Women's Lunch Series

These monthly lunches serve as a space for our female graduate students and postdocs to connect and build community with one another. Each session features a dynamic speaker who addresses some aspect of professional or personal development.

- "Put Away Wet: Moving from Surviving to Thriving in Academia" —Niambi Carter (associate professor, Department of Political Science, Howard University)
- "Navigating Academia's Cultural Norms" —Miriam Solis (assistant professor, community and regional planning, University of Texas at Austin)
- "De-biasing a Process: Using Implicit Bias Triggers as an Audit Tool" —Libby Mahaffy (diversity, equity, and inclusion consultant, MIT Human Resources)
- "The Compromises We Make: Navigating Academia and Motherhood" —Pattie Maes (professor, Program in Media Arts and Sciences and director, Fluid Interfaces research group) and Catherine D'Ignazio (assistant professor, Department of Urban Studies and Planning and director, Data + Feminism Lab)
- "Got JBOPs?" —Denise Minor, JD, CPCC, CNTC (President, MindSpring Metro DC)
- "Journey Through Academia: From First Gen to Faculty to Academic Leadership" —Mari Castaneda (dean, Commonwealth Honors College and professor, Department of Communication, University of Massachusetts Amherst)

Diversity Series

The MAS Diversity Series brings the Media Lab community together each semester to develop skills and explore ideas of diversity and social justice through presentations and discussion.

- “The Role of Critical Reflection in Anti-Oppressive Curriculum and Research Development” — Ashley Stewart (assistant professor and online coordinator, Temple University School of Social Work)

In her talk, Stewart discussed the critical urgency to address forms of oppression and cultural imperialism present in higher education institutions, curriculum, research practices, and inter/intrapersonal group dynamics. Attendees also engaged in critical reflection by examining their individual roles in pursuing anti-oppressive practices and innovative and sustainable culture.

- “Anti-Oppression in Practice: Lessons from a White Lady Who’s Made Mistakes” — Libby Mahaffy (diversity, equity, and inclusion consultant, MIT Human Resources)

In this workshop, attendees used self-assessment and facilitated conversation to explore specific anti-oppressive behaviors and develop competencies for allies. Self-reflective and interactive, participants came away with tangible actions and mindsets to create more inclusive spaces. This workshop was not a magic bullet but rather an opportunity to take attendees farther in their personal work for collective impact.

Diversity Initiatives

Shut Down Academia

In support of the Black Lives Matter movement, the Media Lab and Media Arts and Sciences Program participated in the Shut Down Academia and Shut Down STEM movements on June 10, 2020. This day was designed to mark a “transition into a lifelong commitment of actions to eradicate anti-Black racism in academia and STEM.” Non-Black community members were encouraged to spend the day educating themselves and detailing plans of action to create change. As part of this effort the MAS program sent out a list of recommended readings and resources about race to the community.

Diversity, Equity, and Belonging Roadmap

The Diversity, Equity, and Belonging (DEB) Roadmap consists of four components that guide our work. The components are not sequential, but rather anchor our projects to ensure transparency and accountability:

1. **Knowledge Baseline:** Establish a foundation across the Lab so that everyone understands the same concepts and what they mean
2. **Leadership Development:** Individually based exploration of knowledge baseline meant to shift how community members interact and reflect on their actions
3. **Culture Audit:** Assess Lab processes
4. **Structural Change:** Determine priorities and maintenance plan

Improving Lab Culture Workshops

The first workshops we hosted as part of the DEB roadmap were the Improving Lab Culture Workshops. In order to improve the Media Lab's culture and environment we partnered with the Violence, Prevention, and Response Office (VPR) and the Institute Discrimination and Harassment Response Office to hold workshops for the entire Media Lab community. All staff, faculty, and students were required to participate in these workshops which were held throughout the winter Independent Activities Period and during the spring and fall terms.

These workshops were created specifically for the Media Lab community and addressed harassment, assault, discrimination, and community values. Everyone participated with their organizational or research group in order to facilitate individual group discussion and understanding of these topics. All attendees were encouraged to continue such discussions outside of the workshop format. In total we have held 18 workshops for operational and research groups.

Proactive Approaches to Staff Culture Workshops

Another workshop we hosted as a part of the DEB roadmap was for faculty, research staff, and operations department heads and was led by Libby Mahaffy (central Human Resources Department) and Gurleen Kaur Singh (VPR). During the 90-minute Proactive Approaches to Constructive Lab Culture workshop, participants engaged in scenario-based, small group discussions facilitated by a peer. The bulk of this interactive workshop was spent discussing a nuanced and relatable program-specific scenario. Attendees came away having engaged with concrete personal and structural action items. These workshops were held in spring and summer 2021.

Secondary Advisor Program

Following a recommendation from the Student-Advisor Working Group, MAS piloted a secondary advisor program for first-year master's students in fall 2020. Secondary advisors served as an extra resource for students to talk about classes, progress to degree completion, research passions, and career trajectory. Based on positive feedback from the participating students, MAS will be continuing and expanding the program for the next academic year.

Random Acts of Kindness Week

As part of the Mind, Hand, Heart Initiative, Random Acts of Kindness (RAK) Week took place across MIT March 1–5, 2021. MAS Diversity supplemented the Institute-wide events with our own RAK Week activities, which were limited this year due to COVID-19. MAS encouraged the community to shout out their friends, mentors, colleagues, and anyone that has made a difference in their time at the Media Lab. We received 110 shout outs, which were shared with the community.

Professional Development Series

Lily Zhang, manager for graduate student professional development, organized programming around professional and career development, including a lunch series. These workshops focus on career-building skills for traditional and nontraditional trajectories.

- “Job Searching During a Pandemic: Ask a Recruiter”—Chelsea Cohen (recruiting lead, full story)
- “Applying for Your First Grant in Academia”—Ehsan Hoque (associate professor of computer science, University of Rochester)

Recruitment Success

In fall 2021, MAS will welcome 32 new masters and 12 new PhD students. We achieved an even gender split with this year’s incoming master’s cohort as well as a higher percentage of underrepresented minority students than in the past few years.

Masters Enrollment

Ethnicity

Media Arts and Sciences Master Degree Enrollment by Race/Ethnicity, 2012–2021

Race/ethnicity	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
International	19 (58%)	20 (48%)	32 (71%)	21 (47%)	25 (49%)	25 (53%)	26 (48%)	23 (51%)	13 (62%)	15 (47%)
Underrepresented Minorities	3 (9%)	1 (2%)	0 (0%)	6 (13%)	8 (16%)	5 (11%)	7 (13%)	3 (7%)	1 (5%)	6 (19%)
Non-Underrepresented Minorities	11 (33%)	16 (38%)	8 (18%)	16 (32%)	16 (31%)	16 (34%)	16 (33%)	18 (40%)	6 (28%)	10 (31%)
Unknown	0 (0%)	5 (12%)	5 (11%)	4 (9%)	2 (4%)	1 (2%)	4 (6%)	0 (0%)	1 (5%)	1 (3%)

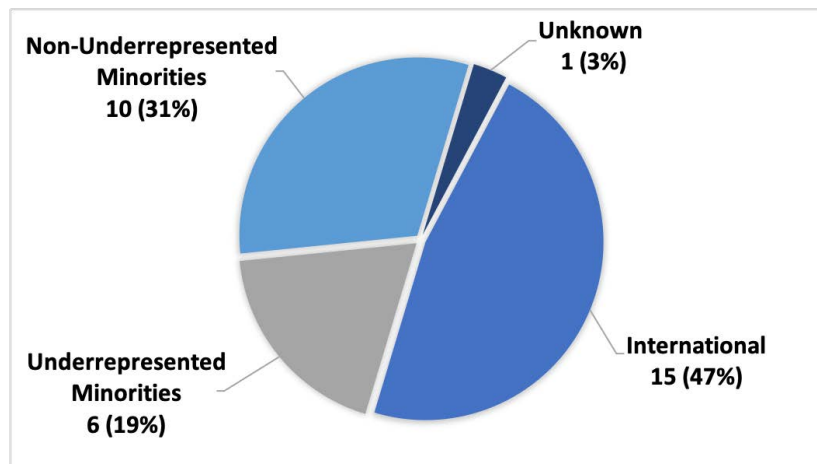
Gender

Media Arts and Sciences Master Degree Enrollment by Gender, 2012–2021

Gender	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Female	8 (24%)	10 (24%)	15 (33%)	16 (34%)	23 (45%)	19 (40%)	22 (42%)	21 (47%)	4 (19%)	16 (50%)
Male	25 (76%)	32 (76%)	30 (67%)	31 (66%)	28 (55%)	29 (60%)	31 (58%)	24 (53%)	17 (81%)	16 (50%)

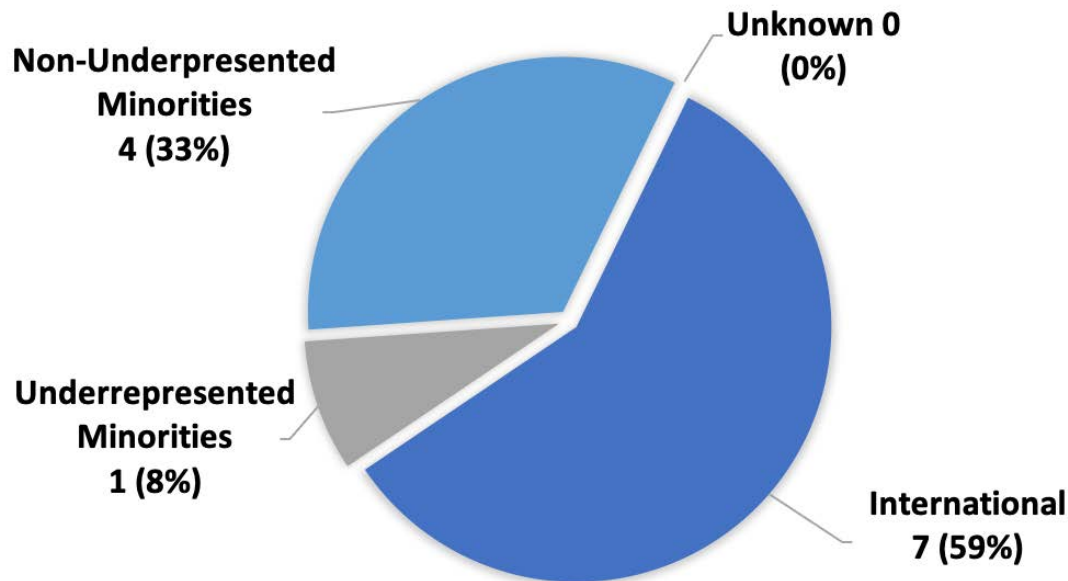
2021 Incoming Masters Cohort

The incoming class has an even female-to-male ratio; approximately 66% of the class are international students or come from underrepresented communities.



2021 Incoming PhD Cohort

The incoming class has a 3:1 male-to-female ratio; approximately 67% are international students or come from underrepresented communities.



Undergraduate Engagement

The Undergraduate Research Opportunities Program (UROP) continued to represent the largest undergraduate presence in MAS and the Media Lab. Although the program did have to move to a virtual experience because of the pandemic, a total of 371 undergraduates from across the Institute participated in a wide variety of UROP research projects at the Media Lab, and many students pursued their undergraduate theses and advanced undergraduate projects under MAS faculty supervision. MAS successfully pivoted to a remote UROP experience as each UROP was asked to outline a remote work plan, and the majority of the projects included a hands-on component such as CAD-design, coding, data visualization and media production. MAS was able to secure additional funding from the MIT Experiential Learning Office to support the students. For the first time, MAS also initiated virtual events, the most popular being a UROP research presentation event.

Faculty and Staff

No new faculty members were hired in the AY2021; however, MAS celebrated the promotion of Cynthia Breazeal, professor of media arts and sciences, and the promotion of Fadel Adib to associate professor without tenure. Both promotions were effective July 1, 2020.

Neri Oxman, associate professor of media arts and sciences and director of the Mediated Matter research group, departed the MAS faculty at the end of May 2021. Oxman resigned from her role at MIT to focus on her design studio in New York City.

Monica Orta was promoted to assistant dean for diversity, equity and belonging and student support at the School of Architecture and Planning. In this new role, Orta will direct all diversity, community-building, and student support initiatives for the whole School of Architecture and Planning. The position of MAS assistant director of student support and diversity is currently being advertised to fill this role at the program level.

Lily Zhang, the MAS manager for graduate student professional development, also departed this position following a leave of absence.

Sampling of Honors and Awards

Alex Pentland, Ramesh Raskar, Joy Buolamwini, and Chazz Simms were all awarded AI Influencer Awards by the MIT Alumni Association. Pentland was given the Lifetime Achievement Award, Raskar and Buolamwini were presented the Better World award, and Simms won the Rising Star award.

A Robotic Positive Psychology Coach to Improve College Students' Wellbeing—jointly written by members, alumni, and UROPs of Affective Computing and Personal Robots research groups Sooyeon Jeong, Sharifa Alghowinem, Laura Aymerich-Franch, Kika Arias, Agata Lapedriza, Rosalind Picard, Hae Won Park, and Cynthia Breazeal—won the Best Paper Award at the 29th International Conference on Robot and Human Interactive Communication.

Dyadic Speech-based Affect Recognition using DAMI-P2C Parent-child Multimodal Interaction Dataset—jointly written by members of Affective Computing and Personal Robots Huili Chen, Yue Zhang, Felix Weninger, Rosalind Picard, Cynthia Breazeal, and Hae Won Park—was nominated for Best Paper at the 22nd ACM International Conference on Multimodal Interaction.

Kristina Johnson of Affective Computing was awarded the Hugh Hampton Young fellowship.

Matt Groh of Affective Computing received an honorable mention from the International Skin Imaging Collaboration Workshop for his paper “Evaluating Deep Neural Networks Trained on Clinical Images in Dermatology with the Fitzpatrick 17k Dataset.”

Guillermo Herrera-Arcos of Biomechatronics was chosen as a 2020–2021 AstraZeneca Young Health Program One Young World Scholar.

Samatha Gutierrez Arango of Biomechatronics was awarded an Amazon Robotics Fellowship.

Ayşe Guvenilir of Biomechatronics and Ufuoma Oviemhada of Space Enabled were awarded fellowships from the Women in Innovation and STEM Database.

A project on the design of an ankle-foot prosthesis for rock climbing with 2 degrees of freedom by Seong Ho Yeon and Emily Rogers of Biomechatronics was featured in the Museum of Science Engineering Design Workshop Engineering Stories.

Neil Gershenfeld was elected a fellow of the American Association for the Advancement of Science.

Amanda Ghassaei, a Center for Bits and Atoms alumna, and Holly Jackson, a collaborating undergraduate student, received worldwide recognition for their work toward mathematically unfolding letters.

Nadya Peek, a Center for Bits and Atoms alumna, was chosen by the MIT Technology Review as an Innovator Under 35.

Rewiring America, a nonprofit formed by Center for Bits and Atoms alumni Saul Griffith and Sam Calish, is working with the Biden administration to create sustainable energy infrastructure.

James Pelletier, a Center for Bits and Atoms alumnus, was lead author in a paper in *Cell* on work toward creating a synthetic self-replicating cell.

The work of Benjamin Jenett, a Center for Bits and Atoms alumnus, was chosen for the cover of the November 2020 issue of *Science Advances*.

City Science group members Kent Larson, Gabriela BÍlá Advincula, Thomas Sanchez Lengeling, with colleagues from With(In) won a grant from the Council for the Arts at MIT to support an immersive documentary installation at the Venice Biennale.

Michael Lin of City Science won the Core77 Design Award 2020 Transportation Award for Persuasive Electric Vehicles.

Naroa Coretti of City Science had research on the MIT Autonomous Bicycle featured in many publications, including *New Atlas*, *autoevolution*, and *tekdeeps*.

Leticia Izquierdo of City Science received a La Caixa Foundation scholarship.

City Science members Mireia Yurrita, Arnaud Grignard, Luis Alonso, Yan Zhang, Cristian Ignacio Jara-Figueroa, Markus Elkatsha, and Kent Larson received the Best Presentation Award at Computing Conference 2021 for the paper titled “Dynamic Urban Planning: An Agent-based Model Coupling Mobility Mode and Housing Choice. Use Case Kendall Square.”

Canan Dagdeviren received the 2021 National Science Foundation Faculty Early Career Award and #M Non-Tenured Faculty Award.

Farita Tasnim, a Conformable Decoders student, received the 2021 National Center for Women in Technology Collegiate Award. She was also a finalist for the 2021 Hertz Fellowship.

Essence Wearables, a Fluid Interfaces project led by Judith Amores, received the 2021 Edison Best New Product Bronze award in the category of Design Enhancements.

Pat Pataranutaporn of Fluid Interfaces was an invited guest speaker at the International Telecommunications Union AI for Good Global Summit.

AlterEgo, a Fluid Interfaces project, was a Time Magazine best invention of 2020.

Living Bits, a paper co-written by Fluid Interfaces members, was nominated as Best Paper at the ACM Augmented Humans 2020 conference.

Alex Pentland, with co-authors Alexander Lipton and Thoman Hardjono, published *Building the New Economy: Data as Capital*, which will be released in October 2021.

Alex Pentland served as a leader on the Working Group on Digitalization for the Annual Policy Dialog of the World Leaders Alliance.

Two Lifelong Kindergarten projects—Scratch, and Learning Creative Learning—were selected among the top 100 education innovations for 2021 by Hundred.org.

Deblina Sarkar was featured in *Imagination in Action*, received the Young Scientist Excellence Award at Microsystems and Nanoengineering Young Scientists Forum, was invited to be an associate editor for *npj 2D Materials and Applications*, was MIT's nominee for the 1907 Trailblazer Award, and was featured in an article in *Neuron*.

Randi Williams of Personal Robots was named as a 2021 Microsoft Research PhD Fellow.

Two students who have received full two-year scholarships from the Day One fund will join the Personal Robots group this fall.

Anastasia Ostrowski and Daniella DiPaola of Personal Robots received a research grant from the Harold Horowitz Student Research Fund.

Nina Lutz of Poetic Justice received honorable mention for the 2021 Harold and Arlene Schnitzer Prize in the Visual Arts.

Juliana Cherston of Responsive Environments was awarded a fellowship from Accenture and a grant from the ISS National Laboratory Materials Science in Space.

Ali Shtarbonov of Responsive Environments was awarded the Gold Medal at the CHI 2021 Graduate Student Research Competition. He was also awarded the Silver A' Design Award for Scientific Instruments and Research Equipment Design, and won first place at the IROS 2020 Workshop on Application-Oriented Modeling and Control of Soft Robots.

Valentina Sumini of Responsive Environments was nominated as Ambassador of Italian Design in the World 2021.

Irmandy Wickasono of Responsive Environments was a finalist in the student category of the Fast Company Innovation by Design Awards for his work in Magsense for the Saving Face project. He was also a finalist in the student category for the 2021 Lexus Design Award for KnittedKeyboard.

Fadel Adib, PI of the Signal Kinetics group, received the 2021 Sloan Research Fellowship in Computer Science.

Osvy Rodriguez, an undergraduate student working with the Signal Kinetics group, won MIT's Outstanding UROP award for the School of Architecture and Planning.

Deb Roy of Social Machines was appointed visiting professor at Harvard Law School and was also named to the Aspen Institute Committee on Information Disorder.

Danielle Wood was featured in several outlets, including Bloomberg, *The Week*, Big Think, *Science*, and *Axios*.

Neil Gaikwad and Gladys Ngetich of Space Enabled were selected as Rising Stars in Aerospace.

M. Regina Apodaca M. of Space Enabled won an Upstander award from MIT AeroAstro.

Golda Nguyen and Jack Reid of Space Enabled were awarded Soffen Fund Travel Grants.

Ufuoma Oviemhada of Space Enabled won two MIT RISE awards for her leadership, activism, and event organization on campus this year. She was also selected by the Future Space Leaders Foundation as a Future Space Leader.

Ken Nakagaki of Tangible Media was offered a faculty position at the University of Chicago. He also won the Core 77 Student Notable Design Award for his Hermits project, and was also featured as an Innovator Under 35 Japan and Innovator Under 35 Asia Pacific in the *MIT Tech Review*.

Tod Machover

Academic Head

Muriel R. Cooper Professor of Music and Media