

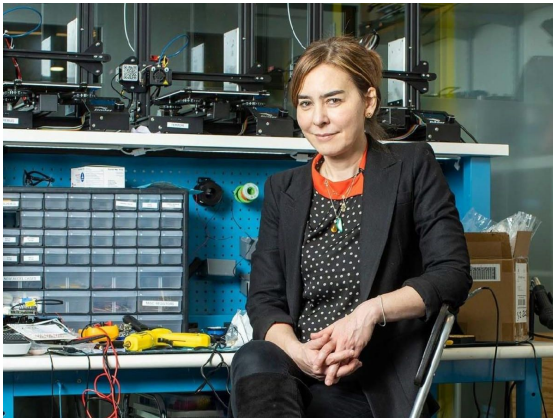
Personal Solutions

With Commencement, we close out another successful academic year, uncovering new findings and implementing solutions toward achieving your project goals, in addition to mentoring students and submitting patents. It was wonderful to see many of you in-person this year at conferences and in the Lab, and we thank all who joined us for our spring events: Climate Implications of Computing and Communications workshop, the What's Next seminar series, our Open House and Industry Showcase. Here, we appreciated the opportunity to share tailored insights and talks to tackle your questions head-on and how the vision for the Lab will evolve with you for next year.

We hope you enjoy your summer break, and look forward to seeing you in the fall.

Aude Oliva, MIT director of the MIT-IBM Watson AI Lab
David Cox, IBM director of the MIT-IBM Watson AI Lab

In the Lab



Katabi works to bring personalized medicine home

[She develops touchless sensors for remote health monitoring.](#)

The Katabi group is working toward developing "invisible" sensors and wireless signaling to continuously assess people's basic vitals and medical conditions, improving home health care.



Exploring emerging topics in artificial intelligence policy

[Global stakeholders across sectors discuss critical policy questions](#)

MIT Schwarzman College of Computing Dean and MIT Lab co-chair Dan Huttenlocher moderates a discussion on artificial intelligence laws with panelists Jonathan Zittrain, Eva Kaili, and Bitange Ndemo during the second AI Policy Forum Symposium.



MIT to launch new Office of Research Computing and Data

[Enhancing computing infrastructure and services](#)

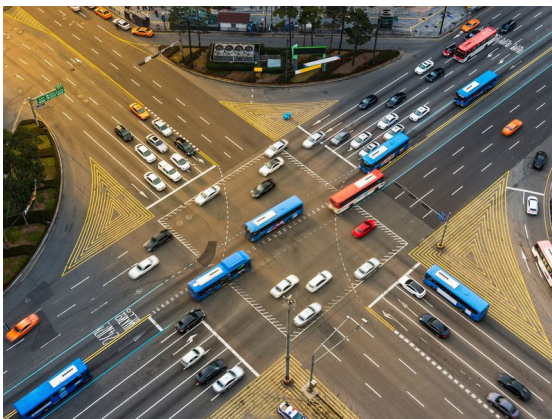
The Office of Research Computing and Data will provide services spanning hardware, software, and cloud solutions, including data storage and retrieval, and offer advice, training, documentation, and data curation for MIT's research community. It will also work to address emerging or highly specialized needs, and it will advance strategic collaborations with industry.



Q&A: Critical questions in AI policy

[Trends, impact across sectors, and building understanding and practice of effective AI policy](#)

MIT professors Aleksander Madry and Asu Ozdaglar, and Luis Videgaray, director of MIT AI Policy for the World Project explore effective regulations and their implications, the evolution of how machine learning is currently developed and deployed, and policy's potential effects on healthcare, mobility, and social media.



On the road to cleaner, greener, and faster driving

[Lab researchers use artificial intelligence to help autonomous vehicles avoid idling at red lights.](#)

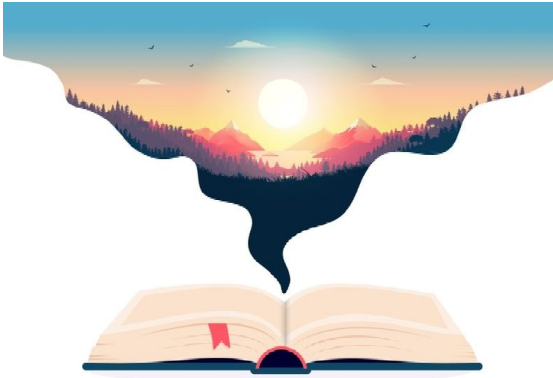
Work from the group of MIT professor Cathy Wu demonstrates a machine-learning approach that can learn to control a fleet of autonomous vehicles as they approach and travel through a signalized intersection in a way that keeps traffic flowing smoothly. Their method also reduces fuel consumption and emissions while improving average vehicle speed.



Rooting out bias

[Examining fairness of some widely used explanation methods](#)

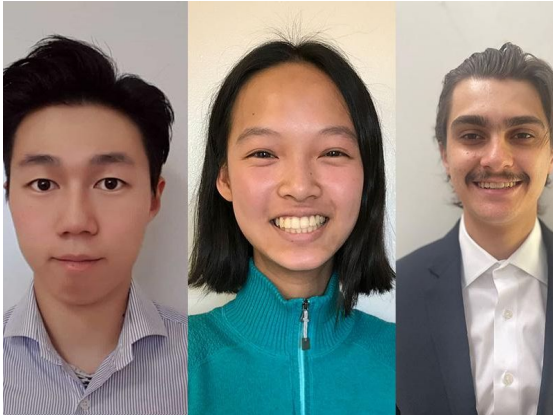
Lab-supported research from the Marzyeh Ghassemi group finds that the explanation methods designed to help users determine whether to trust a machine-learning model's predictions can perpetuate biases and lead to worse outcomes for people from disadvantaged groups.



Hallucinating to better text translation

[Multimodal method provides enhanced machine translation.](#)

A machine-learning method from MIT and IBM researchers imagines what a sentence visually looks like, to situate and ground its semantics in the real world, improving translation, like humans can. Further, it demonstrates improved accuracy of machine translation over text-only translation.



Student-powered machine learning

[Recent MEng graduates reflect on their application-focused research with the Lab.](#)

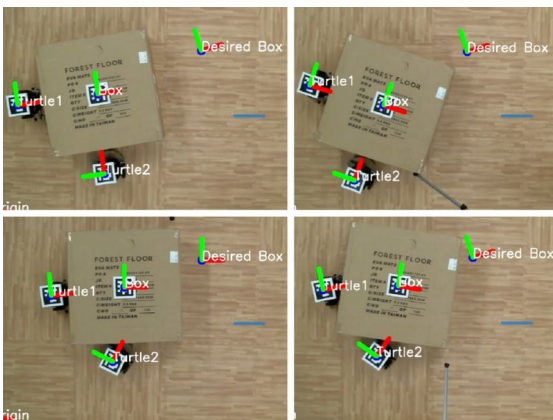
Collaborating with researchers from academia and industry, the graduates have improved text classification with limited labeled data, designed machine-learning models for better long-term forecasting for product purchases, and used synthetic data for action recognition in videos, taking away a sense of mastery.



Keeping web-browsing data safe from hackers

[Understanding a complex security flaw that leaks website data and thwarting it](#)

Work from MIT professor Mengjia Yan's group analyzed a powerful, machine-learning assisted side-channel cyberattack, known as a website-fingerprinting attack, and then developed strategies that dramatically reduce the attacker's chances of success.



Devising a recipe for improving any autonomous robotic system

[Speeding up the design of walking robots, self-driving vehicles, and soft and dexterous robots](#)

Working with the Lab, Chuchu Fan's team has created a new general-purpose optimization code that can be applied to simulations of virtually any autonomous robotic system and can be used to automatically identify how and where to tweak a system to improve a robot's performance.



A path to AI impact

[The Lab's Industry Showcase propels research and computing from theory to practice](#)

In May, the Lab opened its doors to researchers from both institutions, as well as its member companies, to discuss the shared goal of translating AI research to impact business and society. Attendees participated in specialized talks and small group demonstrations of machine learning applications. Presentations from directors and experts, panel discussions and a short film covered the process of discovery and how Lab executives are tackling implementation.

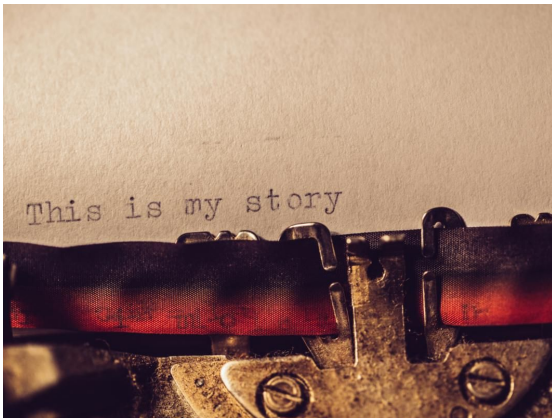


A safer, lower-cost alternative for computer vision pretraining

[How synthetic data sidesteps the minefields of learning from real-world examples](#)

Real data can have many shortcomings, from high curation costs to baked-in vulnerabilities and biases. A pair of Lab papers presented at CVPR highlight the benefits of training machine learning models on computer-generated data.

In the Media



Mistaking fluent speech for fluent thought

MIT professor and Lab researcher Joshua Tenenbaum co-authors in [The Conversation](#) how Google's powerful AI spotlights a human cognitive glitch when it comes to human-like language. The team demonstrates how cognitive process can lead to human-generated, coherent text, but while text is created, AI builds mental models, that are behind the text, out of thin air, leading to potential biases. The writers point out that "fluent language alone does not imply humanity."



Wells Fargo prepares to take a quantum leap

The financial institution is researching the possibilities of quantum computing and validating use cases for the coming quantum disruption. [CIO](#) describes how the Lab is helping Wells Fargo to explore and test-drive mathematical computations, for financial applications, such as trades done in parallel and fraud detection systems.



Why scientists are turning molecules into music

MIT professor Markus Buehler captures the vibrations of molecules turning them into audible sounds that can be used to study and create new materials and technologies. [Smithsonian Magazine](#) shares a Lab-supported method to sonify fire and generate novel flame images.



Fireside chat - reasserting U.S. leadership in microelectronics

In a discussion for [INFER Public](#), MIT professor and Lab researcher Jesús del Alamo and professor Beth Sanner from UMD/ARLIS and former Deputy Director for National Intelligence expand on the global semiconductor shortage, the current state of the U.S. semiconductor industry, and the path forward for the U.S. to reclaim its superpower status in microelectronics as a matter of national security.



More language, less labeling

During a recent [This Week in Machine Learning & AI](#) podcast, Kate Saenko of Boston University and a consulting professor for the Lab explores the research frontier for the field of multimodal learning, challenges of being a researcher in a world where compute is monopolized, and a few papers presented at this year's IEEE / CVF Computer Vision and Pattern Recognition Conference (CVPR).

Recent Events

During the Lab's Industry Showcase this spring, we presented a short film [“Quantum, AI & Hybrid Cloud converge: The future of computing”](#).

The Lab [co-hosted a workshop](#), with discussions from industry and academia, exploring initiatives that can potentially lower the climate impacts of the computing and communications sectors.

Lab Highlights

Collin Stultz named [co-director and MIT lead](#) of the Harvard-MIT Program in Health Sciences and Technology.

MIT professor Vinod Vaikuntanathan wins the [2022 Godel prize](#) for homomorphic encryption research.

MIT professor Harry Tuller selected as a [Materials Research Society Fellow](#).

MIT professors Caroline Uhler, Song Han, Phillip Isola, Arvind Satyanarayan, David Sontag [receive promotions](#), effective July 1.

Papers from Lab researchers Ben Hoover, Arvind Satyanarayan, and Hendrik Strobelt won best paper honorable mentions at [ACM IUI 2022](#)

and [ACM CHI 2022](#).

Over 60 papers presented at premier conferences this summer.