MIT-IBM Watson AI Lab

Upcoming Events

SERC Symposium

Social and Ethical Responsibilities of Computing (SERC)
April 18, 8 a.m.-5:30 p.m. ET

Join the Social and Ethical Responsibilities of Computing for an in-person event with panel discussions including several Lab researchers on the implications of data and algorithms, beneficent and fair AI, equitable and personalized health, algorithms and humans, and ethics and computing education. Register here.

Superpowers

TEDxMIT
April 22, 2:45.-6:45 p.m. ET

What turns talent into a power? During this in-person TEDxMIT event, Lab researchers Armando Solar-Lezama, Connor Coley, Manish Raghavan and others from MIT will share their stories, from how they discovered their superpowers to how they grew, fought for, and regrew them over the years. Register here.

The Thriving Stars of Healthcare and Medical Technology

MIT EECS series
May 8, 3-5 p.m. ET

During an in-person, moderated panel discussion, up-and-coming researchers from MIT's EECS will put exciting new developments in the world of healthcare and medical technology into broader societal context. Registration required.

In the Lab

A four-legged robotic system for playing soccer on various terrains

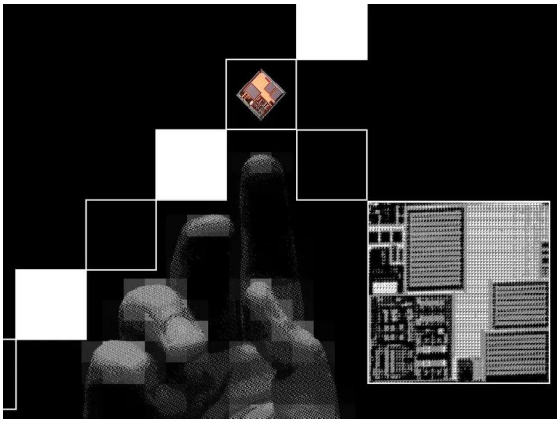
"DribbleBot" can maneuver a soccer ball, adapting to varying ball dynamics.

Researchers from the Lab's Pulkit Agrawal group have developed a reinforcement learning system for in-the-wild dribbling on diverse natural terrains including sand, gravel, mud, and snow using onboard sensing and computing. In addition to these football feats, such robots may someday aid humans in search-and-rescue missions.

Designing neural networks optimally suited for certain tasks

With the right building blocks, machine-learning models minimize misclassification of data inputs.

A new method from the Lab group of Caroline Uhler describes these novel optimal building blocks, called activation functions, and show how they can be used to design neural networks that achieve better performance on any dataset. The work could improve accuracy on tasks like fraud detection or spam filtering.



Explainer: What are chiplets?

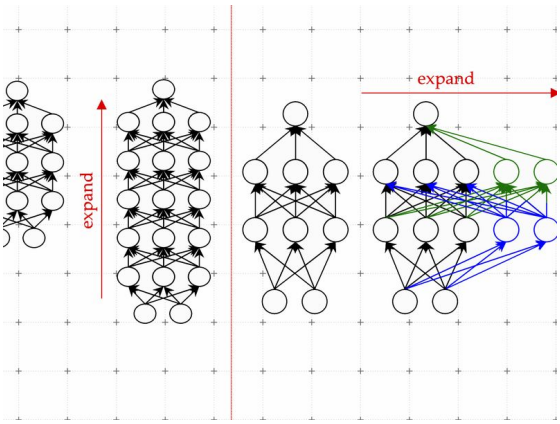
The future of semiconductors is going to look very different from the last two decades.

In the pursuit of cheaper and increased compute power, researchers have been developing hardware called systems on a chip (SOC) technology, but the process of shrinking the chip components down is now seeing roadblocks. Researchers at IBM are working to now break apart the system, helping to facilitate the use of technology like AI foundation models, which require much more compute and memory.

School of Engineering welcomes new faculty

[Eleven new faculty members join six of the school's academic departments and institutes.]

The MIT School of Engineering is welcoming 11 new members of its faculty. Their areas of expertise include semiconducting materials, human health in space, physics-informed deep learning, materials for nuclear energy, and using machine learning to address challenges in agriculture and climate change, to name a few.



Learning to grow machine-learning models

[New LiGO technique accelerates training of large machine-learning models.]

Lab researchers Rameswar Panda, Leonid Karlinsky, Rogerio Feris, Yoon Kim, and Lab co-director David Cox have developed a framework that uses the weights from a smaller neural network model to expand and grow a new model. The approach reduces the monetary and environmental cost of developing AI applications.

Explainer: What are generative AI models?

[Insights into some use cases, as well as advantages and disadvantages]

Generative AI has stunned the world with its ability to create realistic images, code, and dialogue. In this video, Lab member program lead Kate Soule explains how a popular form of generative AI, large language models, works and what it can do for enterprise.

It’s a weird, weird quantum world

[Peter Shor shares a brief history of quantum computing from a personal viewpoint.]

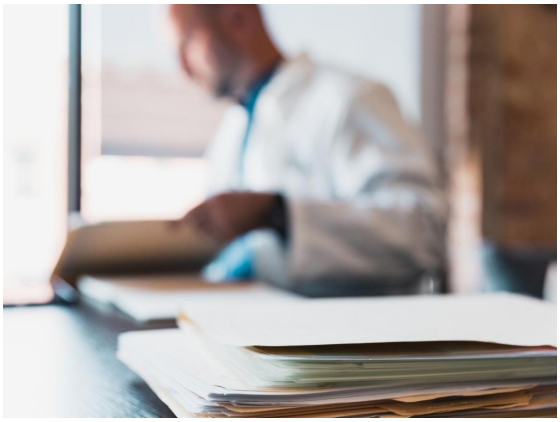
In MIT’s 2023 Killian Lecture, Lab researcher Peter Shor provided a brief history on quantum computing and its intersection with cryptography, including delving into personal achievements like demonstrating how a quantum computer could solve a real, practical problem.

MIT professor to Congress: “We are at an inflection point” with AI

Urging lawmakers to ask rigorous questions about how AI tools are being used by corporations

In a hearing titled “Advances in AI: Are We Ready for a Tech Revolution?” before the House Subcommittee on Cybersecurity, Information Technology, and Government Innovation, Lab researcher Aleksander Mądry asked lawmakers to pay attention to the purpose and explainability of algorithms, as well as ensuring their consistency with society's goals.

In the Media



Doctors are drowning in paperwork. Some claim AI can help

It's well known that physicians have to process tons of documentation, like health records and treatment plans, and a handful of companies see AI chatbots as a way to reduce some of that work, *NPR* reports. Lab researcher Marzyeh Ghassemi advises caution when considering this help as some models may reflect human biases based on medical notes and provide less than optimal suggestions.

MIT’s soccer-playing robot dog is no Messi, but could one day help save lives

A four-legged, soccer-playing robot — developed in the group of Lab researcher Pulkit Agrawal — can not only handle rough terrain, "but its advances could one day help save lives," writes *Popular Science.* Equipped with real-time computing and sensing, Dribblebot can run simulations with real physics parameters to help it toward, one day, navigating dangerous scenarios autonomously.

How good are chatbots at diagnosing medical conditions?

With the internet, self-diagnosis has been made easy but is discouraged by doctors. Now, they're seeing that more patients are turning to chatbots for help with a symptom search, reports *Scientific American.* This calls into question their trustworthiness, and Lab researcher Marzyeh Ghassemi shares how these AI uses can perpetuate prejudices that already exist in data and on the web.

Age of AI and the rapidly evolving relationship between AI, humans

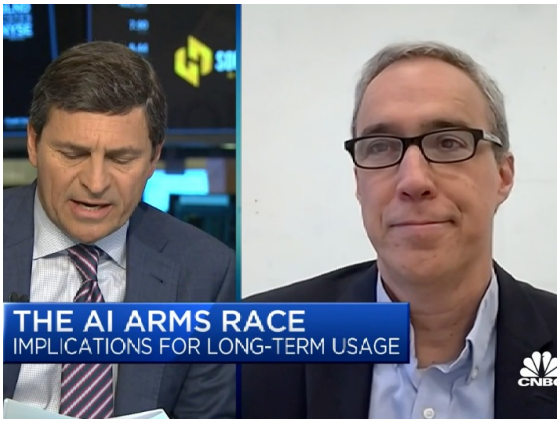
In a recent conversation with *3 Takeaways*, Lab co-chair and MIT Schwarzman College of Computing dean Dan Huttenlocher discusses how and why we need to partner with this foundational technology. He also shares some surprising examples how AI is being integrated into the basic fabric of human activity.

Adversarial robustness for machine learning with Pin-Yu Chen

Lab researcher Pin-Yu Chen speaks with *MLSecOPs* about trustworthy AI, types of vulnerabilities of models to adversarial attacks, and examples of how to enhance model robustness. He discusses security measures that can be taken and how businesses can justify the cost and value of implementing adversarial defense methods in their machine learning systems.

How synthetic data is boosting AI at scale

Collecting and labelling data takes time, money and resources, but generated data offers many advantages, reports *VentureBeat*. For instance, the Lab has created ThreeDWorld and Task2Sim, generating realistic images, scenes, and objects that can be used to pretrain other models. “Doing as much as we can with synthetic data before we start using real-world data has the potential to clean up that Wild West mode we’re in,” says Lab co-director David Cox.



AI Space: This technology is at the level of humans, says MIT’s Daniel Huttenlocher

Lab co-chair and MIT Schwarzman College of Computing dean Daniel Huttenlocher joins CNBC’s *Squawk on the Street* to discuss the current state of AI and how generative AI advances could impact our future. “These recent advances in generative AI technology really do represent a completely different capability in computing than anything we have experienced,” says Huttenlocher. “This is the first tech that can create humanlike expression.”

Lab Highlights

Lab researcher Jacob Andreas was honored with the Junior Bose Award for Excellence in Teaching, which is given each year by the School of Engineering to an outstanding educator up for promotion to associate professor without tenure.

Lab researcher Caroline Uhler named Society for Industrial and Applied Mathematics (SIAM) Fellow for 2023, for her “fundamental contributions at the interface of statistics, machine learning, and biology”.

Online Learning

MIT Introduction to Deep Learning
A Lab-sponsored course teaches the fundamentals of deep learning.

Making AI Work: Machine Intelligence for Business and Society
A joint MIT Sloan & Schwarzman College of Computing Executive and Professional Course begins June 7.

Unsupervised Machine Learning: Unlocking the Potential of Data
A joint MIT Sloan & Schwarzman College of Computing Executive and Professional Course begins June 14.

Designing Efficient Deep Learning Systems
An MIT Professional Course begins July 17.