MIT-IBM
Watson
AI Lab



# Upcoming Events



## Building an equitable quantum computing future

"What's Next" seminar series
February 15, 10-10:30 a.m. EST

This virtual seminar will feature Kayla Lee, the Academic Alliance Lead at IBM Quantum, who will speak about about how we can work to build a quantum future that includes those who have historically been excluded from science and technology. Register here.
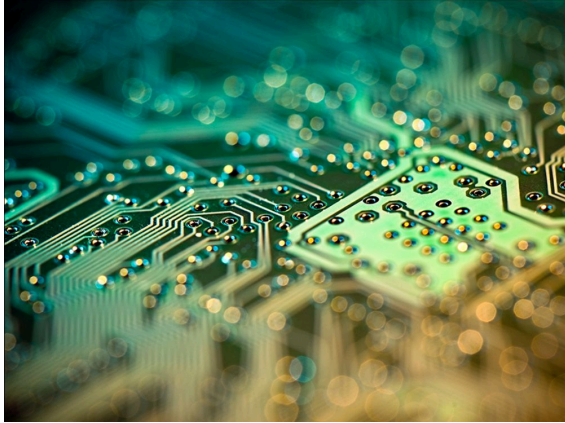
## Semiconductor technology translation & hard-tech startups

[Workshop to translate ideas from academic labs to industry and into the market](#)
February 15, 10 a.m.-6 p.m. EST

This virtual workshop will survey the landscape for startup support and tech translation to identify challenges and opportunities to improve the national ecosystem for launching and sustaining hard-tech startups. Here, industry and academia collaborate to advance the resurgence of U.S. leadership in semiconductors and microelectronics. [Register here.](#)

## Climate implications of computing & communications workshop

[Pathways to lower climate impacts](#)
March 3-4, 10 a.m.-2 p.m. EST

Demand for computing and communications is expected to increase significantly with considerable impacts on the planet. The MIT Climate and Sustainability Consortium, the MIT-IBM Watson AI Lab, and the Schwarzman College of Computing are hosting a virtual workshop, with discussions and collaboration, exploring initiatives that can potentially lower the climate impacts of the computing and communications sectors. [Register here.](#)

# In the Lab
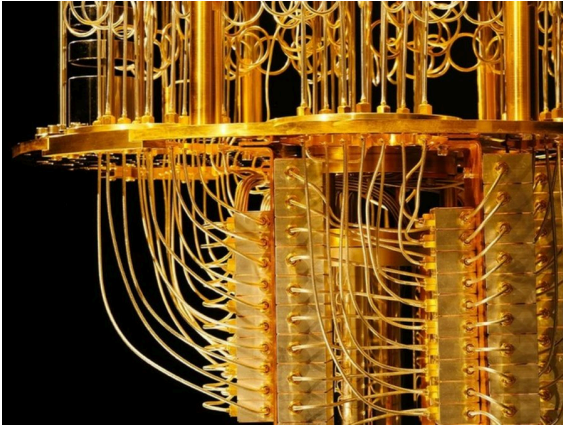
## A new language for quantum computing

["Twist" describes and verifies which pieces of data are entangled in a quantum program.](#)

Twist is an MIT-developed programming language that can describe and verify which pieces of data are entangled in a quantum program, through a language a classical programmer can understand. The language uses a concept called purity, which enforces the absence of entanglement and results in more intuitive programs, with ideally fewer bugs.

## Demystifying machine-learning systems

[Method automatically describes what the individual components of a neural network do](#)

Lab researchers created a technique that can automatically describe the roles of individual neurons in a neural network with natural language, increasing interpretability. The method can be used to audit a neural network to determine what it has learned, or even edit a network by identifying and then switching off unhelpful or incorrect neurons.
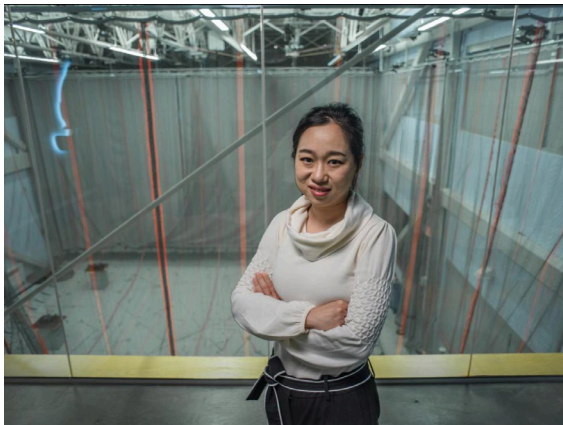
## Chuchu Fan designs safe and reliable autonomous systems

[Her research addresses safety, reliability, and trust issues.](#)

MIT professor and Lab researcher Chuchu Fan use rigorous mathematics to provide autonomous systems with proof of their safety, efficiency, and performance. Her research lies at the intersection of control theory, machine learning, and formal methods; it aims to provide verification for safety-and-mission critical systems, including drones, satellites, self-driving cars, and medical devices.
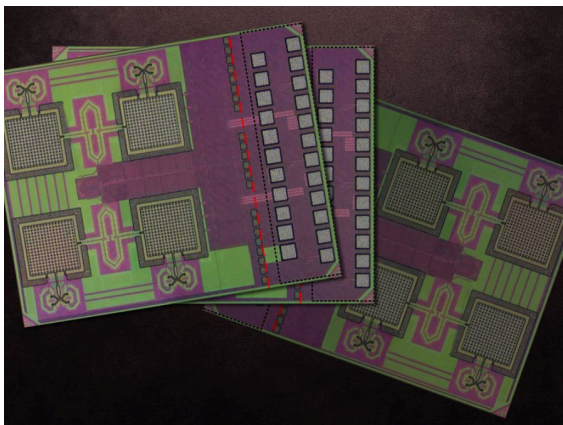
## Reasserting U.S. leadership in microelectronics

[How universities can help the U.S. regain its place as a semiconductor superpower](#)

A new white paper from a group of MIT researchers argues that the country's strategy for reasserting its place as a semiconductor superpower must heavily involve universities, which are uniquely positioned to pioneer new technology and train a highly skilled workforce.

# In the Media
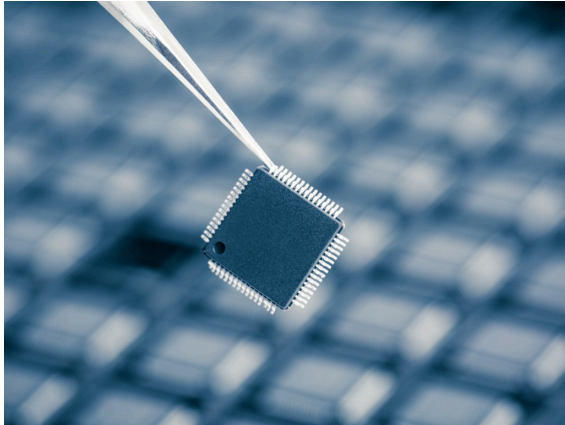
## TinyML is bringing neural networks to microcontrollers

[The method requires few connectivity resources, enabling low cost scaling and democratization.](#)

A new machine learning architecture and inference technique from MIT professor and Lab researcher Song Han's group shrinks the amount of memory needed for machine learning image classification and detection tasks, so that it can run on tiny internet-of-things devices, *BD TechTalks* reports.
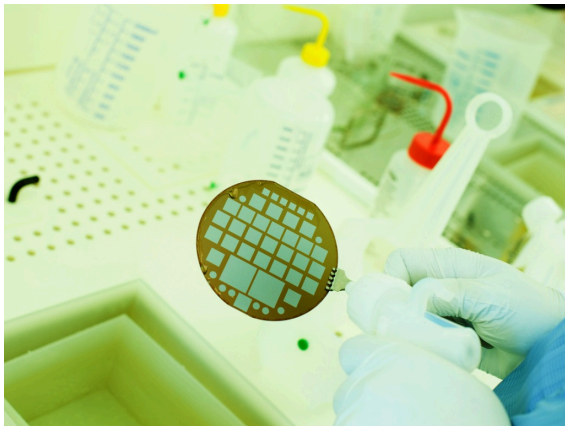
## How to regain the semiconductor high ground

[MIT professor Jesus del Alamo diagnoses industry challenges and identifies solutions.](#)

A recent report from MIT hones in on why the U.S. is slipping behind in global microelectronics design and production. White paper co-author and Lab researcher Jesus del Alamo speaks with *Bloomberg Radio - Baystate Business* about the local impact of semiconductor manufacturing in the U.S., how investment in universities and their resources can play a key role in its revival, and why he's optimistic.

## Putting AI in IoT chips? It's a question of memory

[Research promises to expand the number of IoT applications while enhancing user privacy.](#)

Lab researcher Song Han and his team are working to shrink deep learning down to run on internet-of-things microcontrollers without the need for cloud computing, *Tech Monitor* writes. Han says that with this method, "we can preserve privacy, reduce cost, reduce latency, and make [the device] more reliable for households."

# Watch Our Recent Event

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[Small changes, big effects: how modeling choices affect machine learning predictions](#)

During a "What's Next in AI" webinar, Soumya Ghosh of IBM Research and the Lab, discussed machine learning for spatial and time-series data -- the sensitivity of their predictions to modeling choices and how innocuous changes in assumptions can have a large effect on the model's predictions.

# Lab Highlights

MIT professor Devavrat Shah was selected as a [Fellow](#) of the Institute of Electrical and Electronics Engineers (IEEE).

John Maxwell Cohn, IBM Fellow and Lab researcher, was elected to the [National Academy of Engineering (NAE)](#) "for improving design productivity of high-performance analog and mixed-signal circuits and for evangelizing STEM education."

MIT's Yoon Kim has been appointed [NBX Career Development Assistant Professor.](#)

The Lab has 22 papers accepted to the [International Conference on Learning Representations](#) (ICLR).

In addition to his position as a Lab research scientist, Hendrik Strobelt accepts a faculty position at the University of Konstanz in Germany.

The [MIT Case Studies in Social and Ethical Responsibilities of Computing (SERC)](#) published their latest issue.