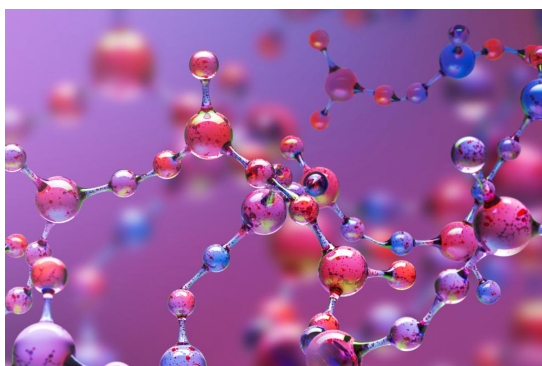




Upcoming Events



AI for chemistry

["What's Next" seminar series](#)

April 12, 10-10:30 a.m. ET

Generating new molecules for industrial and material science applications is critical; however, existing methods often rely on deep neural networks, which require training on large datasets, and may not produce synthesizable compounds. In this webinar, Jie Chen of the Lab and IBM Research, and a guest speaker from Evonik will discuss a graph-based approach that uses grammar to efficiently generate molecules. [Register here.](#)



MIT Efficient AI and Computing Technologies Conference

[Insights from academia and industry](#)

May 5, 9 a.m.-6 p.m ET

This in-person event, presented by the MIT Schwarzman College of Computing and the MIT Industrial Liaison Program, will showcase the most recent developments and tangible impacts of computing technologies in AI hardware and software for improved efficiency and explainability, as well as their applications in diverse technological areas. [Registration required.](#)



Ethics in AI Colloquium | The Age of AI

[How AI will impact employment on a global scale](#)

May 12, 5-6:15 p.m. BST (12 p.m. ET)

In a livestreamed event by the Institute for Ethics in AI, Daniel Huttenlocher, dean of the MIT Schwarzman College of Computing and Lab MIT co-chair, will present the keynote on ethical challenges posed by AI and speak with world-leading experts and users of AI in academia, business and government. [Watch here.](#)

In the Lab



Unlocking new doors to artificial intelligence

[Graduate students engage with IBM to develop their research skills and real-world solutions.](#)

The four 6-A MEng students' projects ranged from generating synthetic data to allow for privacy-sensitive data analysis to using computer vision to identify actions in video that allows for monitoring human safety and tracking build progress on a construction site.



When it comes to AI, can we ditch the datasets?

[Training with synthetic data can rival the use of real data](#)

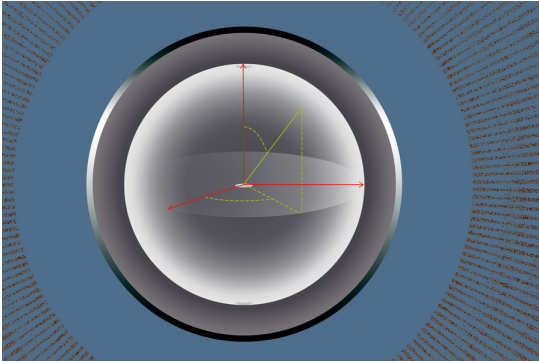
A new study from Lab researchers, directed by MIT's Phillip Isola, demonstrates that the use of a generative machine-learning model to create synthetic data, based on real data, can be used to train another model for image classification.



The man who challenges AI every day

[Trustworthy AI is a tool we can all use.](#)

Pin-Yu Chen, a Lab researcher and member of IBM's Trusted AI Group, believes that AI holds tremendous potential to benefit society. Chen discusses how explainability leads to trustworthiness. He talks about how to make AI hack-proof and his research building adversarial robustness into machine learning models.



Making quantum circuits more robust

[New quantum computing technique makes it more resilient to noise, which boosts performance.](#)

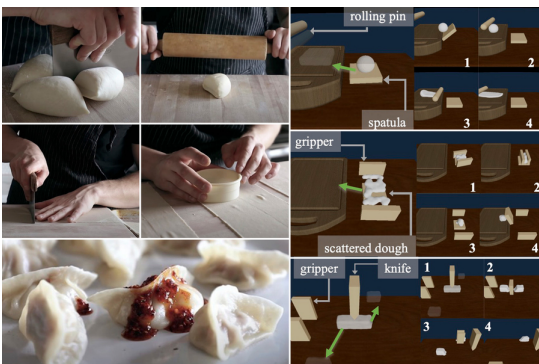
Lab researchers in the MIT Song Han group, and their colleagues, have created a framework that can identify the most robust quantum circuit for a particular computing task and generate a mapping pattern that is tailored to the qubits of a targeted quantum device.



Negin (Nicki) Golrezaei

[Reshaping online marketplaces with machine learning](#)

The MIT professor and Lab researcher's work entails developing data-driven design, algorithms, and optimization approaches to improve the operation and efficient resource allocation of online marketplaces.



Solving the challenges of robotic pizza-making

[A new technique could enable a robot to manipulate squishy objects.](#)

In new Lab-supported work, researchers from MIT, IBM Research, and elsewhere have created a framework that could enable a robot to effectively complete complex manipulation tasks with deformable objects, like dough or cloth, that require many tools and take a long time to complete.



Generating new molecules with graph grammar

[Generalizable method could generate compounds that could be created in the real world.](#)

Lab researchers have developed an efficient machine-learning method that uses chemical knowledge to create a learnable grammar — a linguistics analogy of systems and structures for word ordering — with production rules to build synthesizable monomers and polymers.



Dan Huttenlocher ponders our human future in an age of AI

[He bridges gaps between disciplines to address challenges and opportunities posed by computing.](#)

The MIT Schwarzman College of Computing dean and Lab MIT co-chair, considers what it means to be human in an age where artificial intelligence agents make decisions that shape human actions. Through the college, he moves to incorporate computer science into all fields of study at MIT, while encouraging tools, like AI, to be used ethically and responsibly.

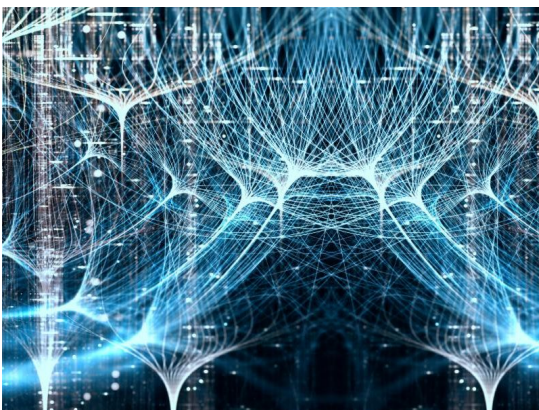


Does this artificial intelligence think like a human?

[Technique compares the reasoning of a machine-learning model to that of a human.](#)

With machine learning, researchers are concerned that a model might produce the correct answer but for the wrong reason. Now, Lab researchers have developed "Shared Interest", a technique which incorporates quantifiable metrics that compare how well a model's reasoning matches that of a human.

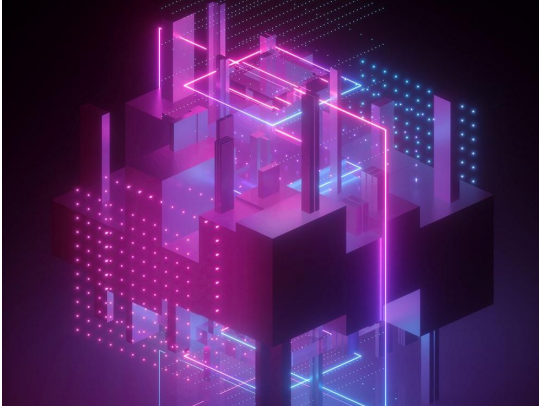
In the Media



Breaking into the black box of artificial intelligence

[Uncovering dynamics of paired neural networks](#)

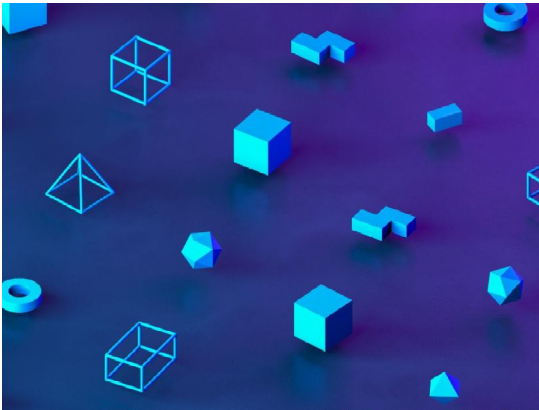
Nature reports that scientists are finding ways to explain the inner workings of complex machine-learning models, including research from Antonio Torralba, MIT professor and Lab, on generative adversarial networks (GANs). Some of his studies have tried to dissect a GAN to determine the role of individual neurons.



Will transformers take over artificial intelligence?

[A highlighted Lab study shows their performance can rival that of a convolutional neural network.](#)

A transformer, a type of neural network architecture, is revolutionizing language and vision processing. Reported by *Quanta Magazine*, work from the Lab has paired two transformer models to invent new, realistic images of celebrities. In the case of TransGAN, its success can be attributed to the replacement of convolutional networks with transformers.



Is geometry a language that only humans know?

[Could shape recognition make humans special?](#)

Article for *The New York Times* explores whether humans are the only species able to comprehend geometry, spotlighting MIT professor and Lab researcher Josh Tenenbaum's approach to exploring how humans can extract so much information from minimal data, time, and energy. "Instead of being inspired by simple mathematical ideas of what a neuron does, it's inspired by simple mathematical ideas of what thinking is," says Tenenbaum.



The evolution of a global scientific readiness force

[From COVID-19 action to the tackling the next crisis](#)

When the pandemic struck, IBM and its partners, including MIT, mobilized, collaborating to accelerate research in this time of need, Dario Gil -- Lab IBM chair, IBM Senior VP and Director of Research--writes for the International Science Reserve (ISR). Now, IBM is working to establish the ISR, a "nimble network of academia, industry, and government" preparing for the next emergency.



Neuro-symbolic AI brings us closer to machines with common sense

[Toward machines that can learn more similarly to humans](#)

AI is a great tool for understanding patterns; however, researchers are trying to take it a step further, to plan actions, understand goals of other agents, and solve problems, like humans can. In a recent IBM workshop, MIT professor and Lab researcher Joshua Tenenbaum describes how he's thinking about intuitive physics and psychology, *BD TechTalks* reports.



AI model to detect anomalies in power grid failures

[Lab-developed framework could detect bottlenecks or help with forecasting](#)

Power grids are crucial infrastructure, and irregularities can lead to productivity disruptions. Now, Lab-supported research, covered by *India Next*, shows how a machine learning model can identify anomalies in the data streams, such as those in an interconnected power grid, water system, or traffic data.

Watch Recent Events

[MIT Quest panel discussion](#)

In this recent event, the MIT Quest for Intelligence and the Artificial Intelligence@MIT student group hosted a discussion focusing on MIT Quest for Intelligence research missions.

[Closing the STEM career gender gap](#)

In a recent "What's Next" webinar, an IBM Research panel discusses what it's like for women to go from studying STEM in school to landing — and keeping — a career in STEM.

[Making quantum error correction more practical](#)

In a recent "What's Next" webinar, IBM quantum researcher Maika Takita detailed her work on hardware-aware code design and the results of these efforts to cut down on the errors in quantum computation.

[Workshop tackles a critical gap slowing the development of new hardware technologies](#)

MIT, SUNY, and RPI co-hosted a workshop that gathered stakeholders from across the country to address the growing gap in the transition from lab to market for new semiconductor and microelectronics technology in the United States.

Lab Highlights

The Lab's next round of Requests for Proposals will circulate soon.

MIT professor and Lab researcher Tommi S. Jaakkola wins AISTATS 2022 ["Test of Time" Award](#), recognizing a paper from 10 years ago that has had a prominent impact in the field.

MIT professor and Lab researcher Devavrat Shah appointed [faculty director](#) of the MIT Deshpande Center, which brings innovative technologies from the lab to the marketplace.

MIT professor and Lab researcher Antonio Torralba receives [honorary PhD](#) from Universitat Politècnica de Catalunya · BarcelonaTech (UPC).

Lab researchers Benjamin Hoover, Arvind Satyanarayan and Hendrik Strobelt received an ACM Conference on Human Factors in Computing Systems ([ACM CHI](#)) honorable mention for their ["Shared Interest" paper](#). Satyanarayan's group was also awarded an [honorable mention](#) at the Conference on Intelligent User Interfaces (IUI).

29 Lab-supported papers have been accepted to the International Conference on Learning Representations ([ICLR](#)).

[Song Han](#), Lab researcher and assistant professor in the MIT Department of Electrical Engineering and Computer Science, has helped to lay the groundwork for [OmniML](#), which has emerged to accelerate AI on edge devices by making machine learning models smaller and faster.