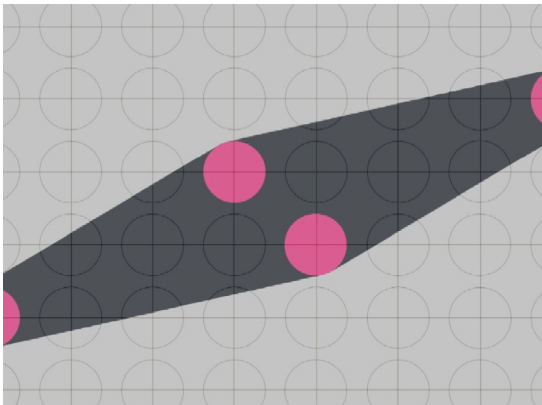




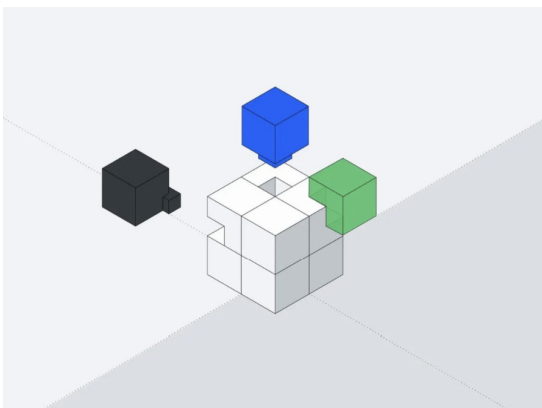
In the Lab



Landmark IBM error correction paper in Nature

[A quantum error-correcting code is about 10 times more efficient than prior methods.](#)

Work from a team with Lab researcher Patrick Rall has produced "gross code" providing a "clear the path toward running quantum circuits with a billion gates or more on our superconducting transmon qubit hardware." The finding is a milestone in quantum computing research.



A faster, systematic way to train LLMs for enterprise

[A synthetic data generation method and phased-training protocol for task-specific knowledge](#)

Lab researchers Shivchander Sudalairaj, Abhishek Bhandwadar, Aldo Pareja, Kai Xu, Lab IBM director David Cox, and Akash Srivastava have developed a technique that maps out a chatbot's current knowledge and then uses a teacher model to generate and help fill in the gaps, as well as run quality checks to greatly improving alignment.

Dealing with the limitations of our

noisy world



[Tamara Broderick uses statistical approaches to understand and quantify uncertainty.](#)

With a love of math, Lab researcher Tamara Broderick is driven by exploration. In her work, she uses a statistical approach called Bayesian inference to better understand the limits of data analysis techniques. She applies this broadly across different fields of study, helping colleagues to craft better data analysis tools for their research.

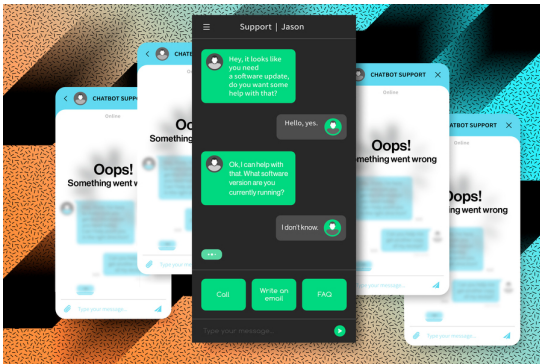
In search of AI algorithms that mimic the brain



[Dmitry Krotov is a theorist on the hunt.](#)

Lab researcher Dmitry Krotov takes inspiration for artificial neural networks from neuroscience. Here, he shares his work on Hopfield networks and Dense Associative Memory to improve their performance, as well as how neuron organization relates to function.

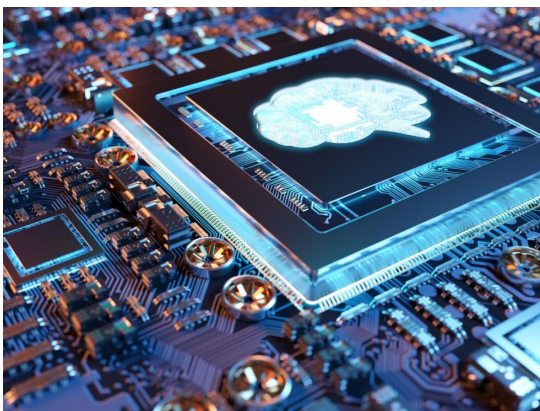
A new way to let AI chatbots converse all day without crashing



[A simple yet effective solution for a problem that can worsen the performance of LLMs](#)

The group of Lab researcher Song Han has developed a method, called StreamingLLM, that uses a sliding cache and "attention sink" in the attention mechanism to provide faster and better performance and longer LLM conversations.

Upcoming Events



MIT AI Hardware Program

[2024 Annual Symposium](#)
May 1, 9:30 a.m.-3 p.m. ET

In a hybrid event, MIT AI Hardware Program researchers will provide project reviews of the current portfolio as well as provide exposure to new projects. The event will be hosted by Lab co-director Aude Oliva and Lab researcher Jesús del Alamo, both of whom are the MIT AI Hardware Program leads. The talks will be followed by interactive demos and posters. [Registration required.](#)

Event Recordings

[Expanding Horizons in Computing](#)

The MIT Schwarzman College of Computing hosted a series of events with MIT faculty, including numerous Lab researchers, on various topics of computing and AI, ranging from security, intelligence,

and deep learning to design and sustainability. These were captured in a series of recorded sessions.

Lab Highlights

Several Lab researchers have co-written preprint impact papers that articulate effective roadmaps, policy recommendations, and calls for action across the broad domain of generative AI and its effects on society. Their work is published in a collection, [An MIT Exploration of Generative AI](#).

Lab researcher Daniela Rus co-authored a book "[The Heart and the Chip: Our Bright Future with Robots](#)."

Online Learning

[Artificial Intelligence: Implications for Business Strategy](#)

A joint MIT CSAIL and MIT Sloan School of Management Course begins
April 17.

[Making AI Work: Machine Intelligence for Business and Society](#)

A joint MIT Sloan & Schwarzman College of Computing Executive and Professional Course begins
June 5.

[Unsupervised Machine Learning: Unlocking the Potential of Data](#)

A joint MIT Sloan & Schwarzman College of Computing Executive and Professional Course begins
June 12.

[AI in Robotics: Learning Algorithms, Design and Safety](#)

A Professional Education Course begins
July 10.

[Reinforcement Learning](#)

A Professional Education Course begins
July 29.

[Advanced Reinforcement Learning](#)

A Professional Education Course begins
August 1.