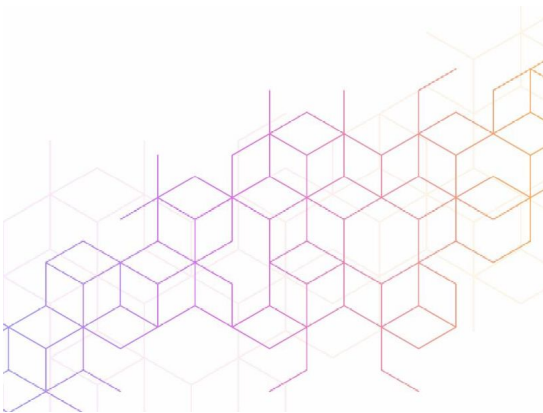




In the Lab



How to build AI scaling laws for efficient LLM training and budget maximization

[A universal guide for estimating how LLMs will perform based on smaller models](#)

Lab researchers Jacob Andreas, Leshem Choshen, and Yang Zhang created a large dataset of pre-trained LLMs and nearly 2 million performance metrics, as well as over 1,000 scaling laws to better understand and recommend how to effectively predict a target LLM's performance.



Towards a generative future for computing

[IBM is exploring a future where generative AI isn't limited to what's in the prompt window.](#)

In a move toward generative computing which includes more low-level LLM operations, Lab IBM Director David Cox and his team including Nathan Fulton and Hendrik Strobelt created Mellea, a library for writing generative programs. It's tools are designed to replace "inconsistent agents and brittle prompts with 'structured, maintainable, robust, and efficient AI workflows.'"



All decisions have trade-offs. Wei Sun is an expert at weighing them

[Applying theoretical concepts in operations research to find a fair pricing policy and a cost-effective way to serve LLMs](#)

In a Q&A, Lab researcher Wei Sun shared her path from operations research at MIT to applications in AI and business at IBM. "Clients often asked, 'What can we do to achieve X?' — a causal question. Yet most AI pipelines rely on correlational models. That disconnect pushed me to explore causal decision-making, a topic I've been passionate about ever since."



MIT tool visualizes and edits “physically impossible” objects

[The “Meschers” tool could help scientists understand physics-defying shapes and spark new designs.](#)

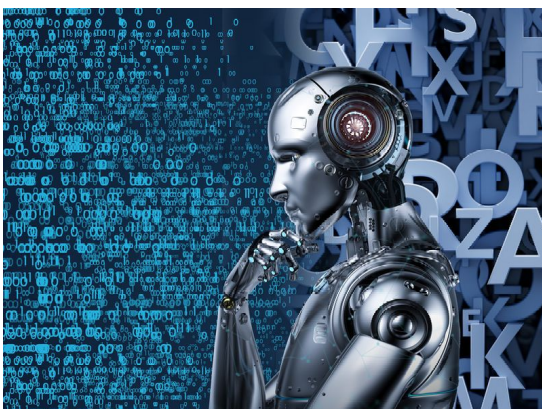
By visualizing optical illusions in 2.5 dimensions, a group led by Lab researchers Justin Solomon and Jonathan Ragan-Kelley developed a way to create multi-dimensional versions of objects that break the laws of physics with convoluted geometries, thereby assisting geometry researchers and artists, as well as thermodynamicists.



Can LLMs learn social skills by playing games?

[A new open-source framework pits LLMs against each other in competitive environments.](#)

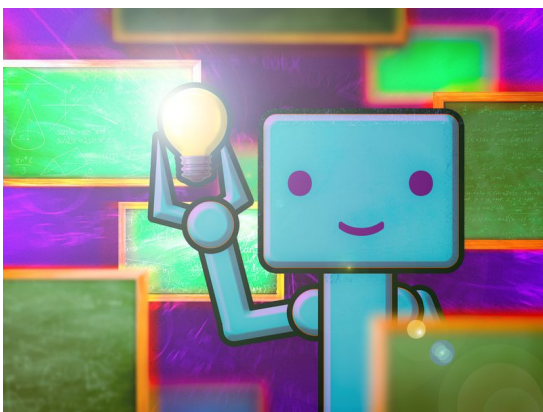
TextArena, created by the Lab group of Leshem Choshen, is an interactive open-source platform designed to test and improve the soft communication skills of LLM agents over many text-based games. It provides dynamic benchmarking through reinforcement learning.



This “smart coach” helps LLMs switch between text and code

[The CodeSteer system could boost LLMs' accuracy when solving complex problems.](#)

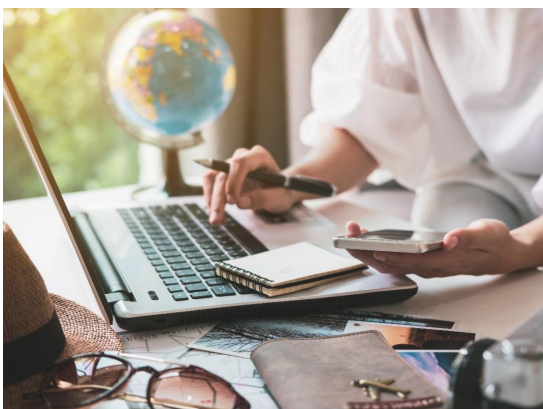
Research from the Lab group of Chuchu Fan has produced a system in which a small LLM iteratively prompts and guides a larger model to better answers, boosting its accuracy on symbolic tasks, like number multiplication.



Study could lead to LLMs that are better at complex reasoning

[Making LLMs more adaptable to challenging tasks like strategic planning or process optimization](#)

A team of Lab researchers led by Jacob Andreas and Yoon Kim developed a method that combines test-time training and in-context learning to adapt an LLM to unseen, complex tasks that require logical deduction.



Inroads to personalized AI trip planning

[Framework supercharges language models, so they can interactively develop valid travel agendas](#)

The Lab team of Chuchu Fan and Yang Zhang designed a framework that leverages a mathematical solver and an LLM to create sensible, complete, and valid plans for travel. It's able to follow user directions and preferences for location, cost, and availability of hotels, transportation, restaurants, and more.



AI-enabled control system helps autonomous drones stay on target in uncertain environments

[The system automatically learns to adapt to unknown disturbances such as gusting winds.](#)

With only 15 minutes of observational flight data, a meta-learning technique developed by the Lab group of Navid Azizan automatically determines which optimization algorithm it should use to adapt to the geometry of air disturbances, improving the tracking performance of the drone.



Animation technique simulates the motion of squishy objects

[Approach could help animators create realistic 3D characters or engineers design elastic products](#)

The Lab team of Justin Solomon leveraged a hidden mathematical structure in complex equations called convexity: They broke the deformation of elastic materials into a stretch component and a rotation component, and found that the stretch portion forms a convex problem that is well-suited for stable optimization algorithms.



Unlocking the next generation of AI in the US financial system

Lab IBM Director David Cox [testified](#) before the US House Committee on Financial Services on the balance of AI innovation; regulatory policy on consumer protections, security, and fairness; and integration with the financial sector. He urged principled progress that is open, trusted, and secure.



Meet Meschers, MIT's tool for building paradoxical digital objects

The Lab groups of Justin Solomon and Jonathan Ragan-Kelley produced a method to visualize "impossible" objects, reports [Gizmodo](#). The technique renders different lighting conditions and allows researchers to explore measuring distances over curved surfaces and heat transport.



Guardrails and growth: AI's role in capital and insurance markets

Lab IBM Director David Cox testified before the US Senate Committee on Banking, Housing, and Urban Affairs Subcommittee on Securities, Insurance, and Investment about "[Guardrails and Growth: AI's Role in Capital and Insurance Markets](#)." He recommended use-case-based risk frameworks, transparency requirements, and open AI environments that "encourage open source contributions and academic-industry-government collaborations. These partnerships drive safety, transparency, and innovation – just as they did during the internet's rise."



MIT researchers make incredible breakthrough that could change how we build cities forever

Work from the Lab group of Elsa Olivetti has produced an AI technique that scans scientific literature and identifies materials that could replace cement, based on their chemical and physical properties, to reduce carbon emissions, reports [Yahoo! News](#).

Lab Highlights

Lab MIT Chair Anantha Chandrakasan named [MIT provost](#).

Lab researcher Priya Donti was selected for the [TIME100 AI 2025](#) list for her work designing machine-learning algorithms to decarbonize the global electricity supply.

Lab researcher Dina Katabi earned the [2026 IEEE Koji Kobayashi Computers and Communications Award](#) for her impact on wireless and network communication, including wireless sensing.

Lab researcher Wojciech Matusik was awarded the [Cadence Design Systems professorship](#) in the MIT Schwarzman College of Computing.

Lab researcher Justin Solomon was named one of the [2025 Schmidt Polymaths](#) to pursue research in new disciplines or using new methodologies.

Lab MIT Chair Anantha Chandrakasan and Lab researchers John Cohn and Xin Zhang received the Best Track Manuscript Recognition for their paper "Efficient Circuit Performance Prediction Using Machine Learning: From Schematic to Layout and Silicon Measurement With Minimal Data Input" from The Nonlinear Circuits and Systems Technical Committee of the IEEE Circuits and Systems Society.