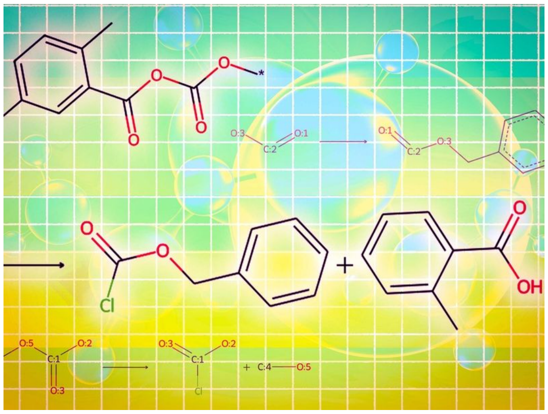
In the Lab

Training LLMs to self-detoxify their language

[Helping LLMs to steer their own responses toward safer, more ethical, value-aligned outputs]

A method from the Lab groups of Luca Daniel and Pin-Yu Chen learns a toxic/nontoxic boundary within an LLM's internal representation and leverages that classifier during inference for improved outputs without sacrificing fluency.



Could LLMs help design our next medicines and materials?

[Using plain language to ask for a new molecule with certain properties and receiving a detailed description of how to synthesize it]

The Lab teams of Wojciech Matusik and Jie Chen developed a multimodal tool that combines an LLM with powerful graph-based AI models to efficiently find new, synthesizable molecules with desired properties based on a user's queries in plain language.

Method assesses and improves the reliability of radiologists' diagnostic reports

[Helping clinicians choose phrases that more accurately reflect that certain conditions are present in X-rays]

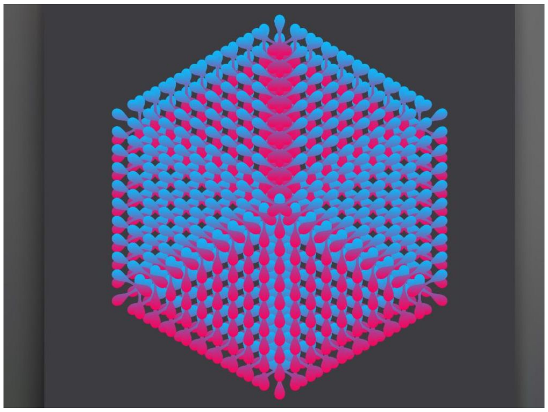
A framework developed by the Lab teams of Rameswar Panda and Polina Golland helps physicians to calibrate language used to express diagnostic certainty e.g., "maybe" and "likely" of a certain medical condition being present and described in a radiology report.

Researchers teach LLMs to solve complex planning challenges

[Leveraging a model's reasoning abilities to create a "smart assistant" that finds the optimal solution]

The groups of Lab researchers Chuchu Fan and Yang Zhang have developed a framework that assists with combinatorial optimization problems for non-experts. The team uses an LLM to break down complex, multi-step problems and applies algorithmic solvers to find the best solutions.

In the Media



Revolutionizing molecule design

A framework, called Llamole, allows users to provide a plain language query and generate molecular structures and synthesis plans. Wojciech Matusik and Jie Chen's Lab teams leveraged an LLM and graph-based reasoning. "By using trigger tokens, specific modules can be activated to handle different aspects of the task, such as property prediction or structure optimization," reports Quantum Zeitgeist.

New LLM framework solves complex planning problems with zero training

The Lab teams of Chuchu Fan and Yang Zhang developed LLM-Based Formalized Programming (LLMFP), which leverages an LLM and a solver to reimagine planning problems as a constrained optimization challenge, reports Devdiscourse.

Tools, not gods: IBM VP on AI, neuroscience and the nature of intelligence

Lab co-director David Cox sat down with [The Deep View] at HumanX to discuss how research in neuroscience influences artificial neural network development and vice versa.

Event Recordings

The Age of AI: Daniel Huttenlocher
During the 2025 MIT AI Conference, Daniel Huttenlocher, the MIT College of Computing dean and MIT Lab co-chair, examined "The Age of AI," where we consider how AI will change our relationships with knowledge, politics, and the societies in which we live. These changes are becoming more prominent with every passing moment, and this session endeavors to find the path that best embraces the change for the benefit of business and society.

Lab Highlights

Lab researchers Yoon Kim and Tess Smidt were promoted to associate professor.

Online Learning

Artificial Intelligence in Health Care
A joint MIT Sloan School of Management & MIT Jameel Clinic Course begins
May 21

Artificial Intelligence in Pharma and Biotech
An MIT Sloan School of Management Course begins
May 28

Artificial Intelligence: Implications for Business Strategy
A joint MIT Sloan School of Management & MIT CSAIL Course begins
May 28

Making AI Work: Machine Intelligence for Business and Society
A joint MIT Sloan & Schwarzman College of Computing Executive and Professional Course begins
June 4

Unsupervised Machine Learning: Unlocking the Potential of Data
A joint MIT Sloan & Schwarzman College of Computing Executive and Professional Course begins
June 11

Machine Learning in Business
A joint MIT CSAIL and MIT Sloan School of Management Course begins
June 11

Graph Algorithms and Machine Learning
An MIT Professional Education Course begins
July 21

Frontiers of Generative AI in Business
A MIT Sloan Executive Education Course begins
July 30

Advanced Reinforcement Learning
An MIT Professional Education Course begins
July 31