

Creating technology that empowers artificial intelligence systems
to acquire knowledge, learn from real-world experience, and
make predictions in complex environments.

MACHINE LEARNING LABORATORY



The University of Texas at Austin
Machine Learning Laboratory

INTRODUCING THE MACHINE LEARNING LABORATORY AT THE UNIVERSITY OF TEXAS AT AUSTIN



Businesses across every industry use machine learning to enhance safety, drive innovation, streamline workflows, and enhance the customer experience. These advances are just the beginning. Machine learning promises to remake society and science in field after field, from rethinking transportation to better understanding brain function to unveiling the origins of the stars in the Milky Way.

The Machine Learning Laboratory at The University of Texas at Austin was launched to fully leverage the potential of this branch of artificial intelligence and to answer one of the biggest questions facing science today:

How do we harness the mechanics of

intelligence to improve the world around us?

Machine learning has the power to reimagine the boundaries of science and reshape society as we know it. The University of Texas at Austin is proud to be on the cutting edge of the discoveries that will define this field. We hope you'll join us.

WHAT STARTS HERE CHANGES THE WORLD

WHY UT AUSTIN IS POISED TO LEAD IN MACHINE LEARNING

The Machine Learning Laboratory was recently designated as the headquarters of the National AI Institute for Foundations of Machine Learning. This provided the laboratory with an influx of resources to pursue some of the most challenging problems at the core of machine learning research. We can build on our strong foundation in algorithms and core machine learning as we branch out to explore machine learning applications across a host of disciplines.

UT Austin is strong in a wide array of machine learning-related fields.

Rankings by US News & World Report

Computer
Science
#10

Artificial
Intelligence
#7

Electrical
& Computer
Engineering
#10

Applied
Math
#7

The university's newly launched Machine Learning Lab (MLL) unites these disciplines into a focused research organization designed to leverage the university's substantial strengths in machine learning to catalyze ambitious new research directions, encourage collaboration, and elevate the university's global profile in the field.

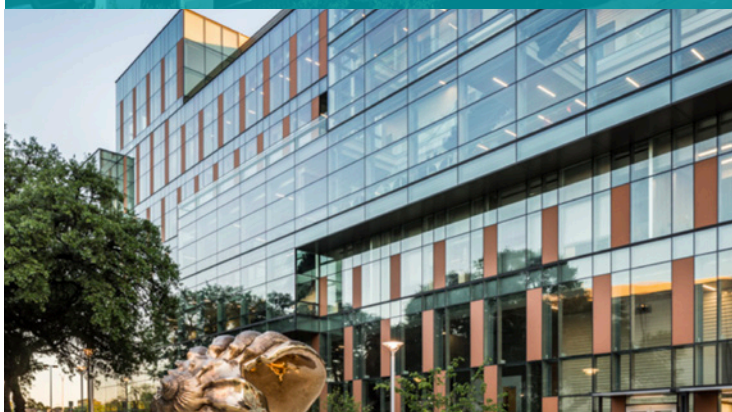
The university houses powerful colleges and institutes with assets across the various application domains, which together provide a unique resource for supporting machine learning research at scale.



The University's Texas Advanced Computing Center (TACC) houses the country's two largest public research supercomputers and



The Oden Institute is the world's leader in computational engineering and sciences



The recently launched Dell Medical School brings with it a vision to reimagine healthcare from the ground up.

RESEARCH AGENDA

Fundamental Machine Learning Methods

In the same way that twentieth-century mathematical discoveries laid the foundation for the digital revolution that transformed the way we live, the fundamentals of machine learning and artificial intelligence are quietly powering every new application of smart technology and driving our progress toward a more connected, data-enhanced world. As the volume of data humans produce—at home, at work, in our cars, and everywhere we go—increases exponentially, the fundamentals of machine learning is empowering us to capture that data, learn from it, and turn it into products, systems, and insights that improve our health, our safety, and our performance in every aspect of our lives. These fundamentals, and all the potential they represent, are at the heart of our research.

Algorithms and deep learning: Building upon the deep learning algorithms that have enabled machines to solve problems based on higher volumes of data than ever before.

Optimization: Improving the speed and accuracy of machine learning through sophisticated optimization tools built to handle large data sets.

Interpretability and fairness: Prioritizing fairness and transparency at every juncture to allay increasing concerns over analytical bias.

Reinforcement Learning: Training robots to learn by trial and error, making calculated decisions to achieve successful outcomes in real-world scenarios.

Scalability: Ensuring our data storage and processing systems are equipped to handle the ever-growing volume of data involved in machine learning initiatives.

FUNCTIONS OF THE MACHINE LEARNING LAB

The Machine Learning Laboratory catalyzes ambitious new research directions, encourages collaboration, and elevates the university's global profile in the field. In addition, the MLL is a venue through which industry partners can collaborate on world-class research to solve real-world problems while accessing top talent.

Workshops and calls for proposals

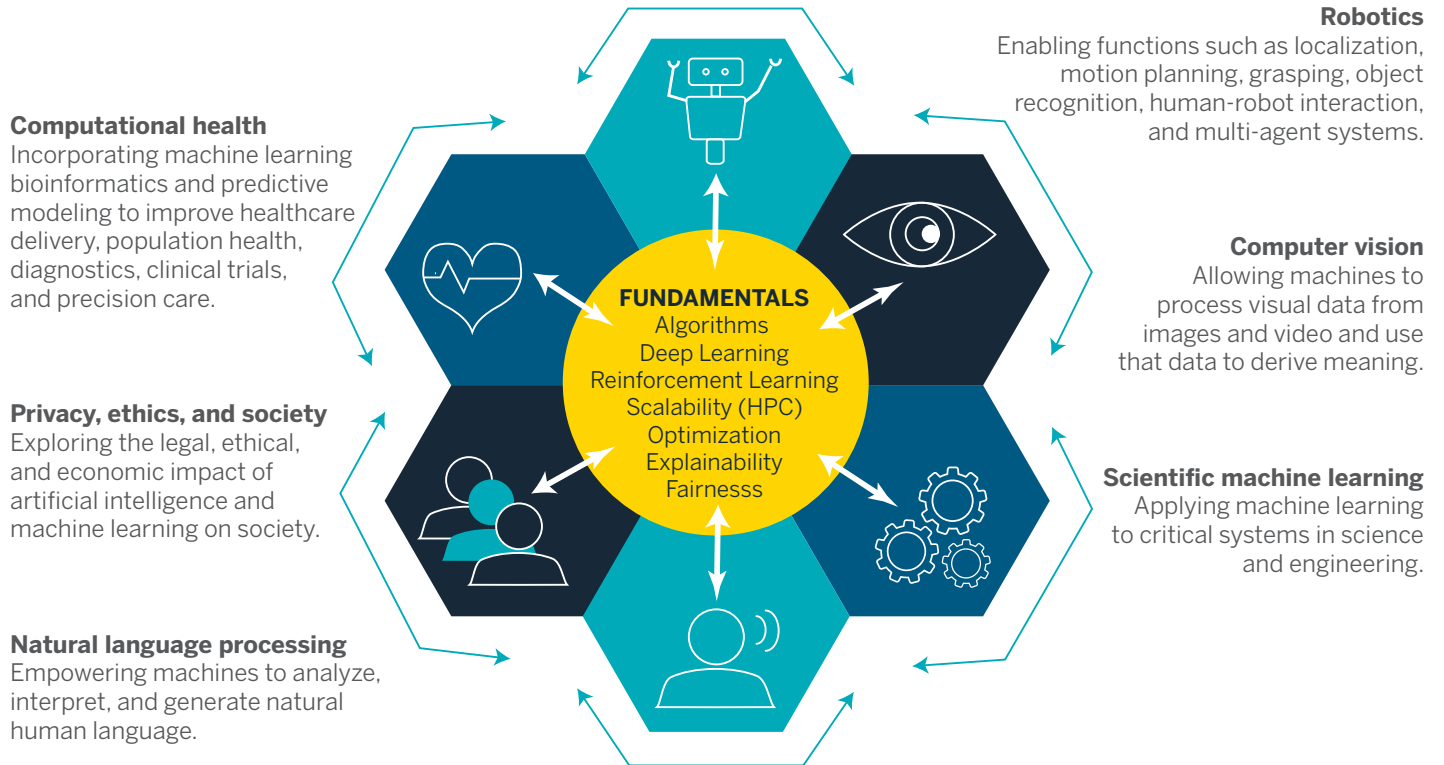
The MLL hosts regular, multi-day workshops for internal and external researchers from both academia and industry, culminating in calls for proposals. The workshops are intended to spark new research projects and collaborations.

Faculty Professorships and Chairs

Over the long-term, the MLL will seek to secure endowed professorships and chairs to incentivize university departments to augment our core and affiliated faculty pool by hiring into areas of interest to the MLL.

Applications

The fundamental principles of machine learning will drive growth in a virtually endless number of applications. Initially, we will prioritize those areas which align with the deep expertise at the University of Texas at Austin; however, the MLL's agenda will remain agile enough to respond to—and stay ahead of—evolving needs.



Visiting Researchers & Research Sabbaticals

The MLL hosts both short and long-term visiting researchers from academic institutions and the corporate world who are collaborating with MLL faculty or working on MLL-funded projects. The MLL provides these visitors with stipends to enable them to take sabbaticals from their home institutions. Similarly, the MLL will offer participating UT faculty funded sabbaticals and summer fellowships to support their own critical research projects.

Graduate Student and Postdoctoral Support

The MLL makes funding available—in the form of fellowships or graduate research assistantships—to graduate students advised by affiliated faculty and working on collaborative MLL projects. In addition, the MLL houses a minimum of six postdoctoral fellows who serve as leaders in the group's research efforts for one to two years each.

EDUCATION AGENDA

AI and machine learning power some of the largest job growth in the modern economy, but there aren't enough students prepared to take advantage of these opportunities. The Machine Learning Laboratory will deploy educational solutions across the academic pipeline to equip the next generation of students with life-changing skills in computer science and artificial intelligence.

Graduate Portfolio Program in Machine Learning

The MLL will build out a graduate portfolio program to give graduate students the opportunity to obtain an official “certification of expertise” in machine learning with their Masters or Ph.D. degree from their home departments. Students in the portfolio program will receive multidisciplinary training in machine learning through a wide range of courses and research seminars from applicable university departments. The portfolio program aims to create an interdisciplinary, student-led research community in machine learning at UT Austin.


Master's Program in Artificial Intelligence

The MLL will launch a new master's program in artificial intelligence that can be delivered affordably, online, and at scale. This program will be one of only a small handful of AI graduate programs nationwide and the only program to make high-quality, advanced AI education available in a low-cost, accessible format. This approach will allow thousands of students who would otherwise find it difficult to obtain an AI education to reimagine their careers.

High School Short Courses

Time and again, experience has shown that, if we want to get students excited about technology careers, we need to start early. Unfortunately, fewer than half of Texas high schools offer even basic computer science coursework—much less advanced coursework in machine learning or AI. That's why the MLL is developing a series of online, self-contained AI short courses for all levels that can be integrated into math classes, to a standard computer science courses, or even after-school or extracurricular programs.





Machine learning and artificial intelligence are priorities for universities across the country, but UT Austin's unique combination of size and quality makes it a natural leader in this increasingly important field. The next generation of machine learning technologies will produce advances in predictive decision-making that will transform the world as we know it. The Machine Learning Laboratory will develop the novel algorithms at the center of this transformation through the support provided by our industry, alumni, and philanthropic partners.

Tomorrow's Machine Learning
technologies are being created today
at The University of Texas at Austin

Learn More, and Get Involved

Contact us today

ml.utexas.edu



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