



Member Success Case Study | Written By: Audrey Woods

Cisco

The landscape of information technology is changing fast. Rapid innovation in areas such as generative AI, quantum computing, computer vision, and cybersecurity mean that companies—especially those who specialize in technology—need to work harder than ever to stay informed and ahead of the curve.

To address this need, digital communications technology conglomerate Cisco created [Cisco Research](#) to both conduct research and monitor academic output in areas of strategic interest, with the goal of achieving a business, technological, and societal impact. Comprised of an international community of engineers and researchers, Cisco Research connects with top academic institutions such as MIT CSAIL to support inquiry, provide funding and resources, and generally advance the state-of-the-art in key technical areas.

“Within the past couple of years, Cisco Research has accelerated the pace of innovation by partnering with several top universities to fund 300+ projects, and wrote more than 50+ papers in a broad set of areas that include AI/ML, cybersecurity and quantum computing,” says Dr. Ramana Kompella, Head of Cisco Research.

CISCO RESEARCH: BRIDGING INQUIRY AND INDUSTRY

As a company, Cisco is committed to connecting the world through technology. Founded in 1984 by two Stanford University computer scientists who wanted the ability to email each other from their respective offices, the business began with network technology, specifically the software and hardware behind the first multiprotocol routers. Now Cisco—named after the city San Francisco—has grown to more than 83,000 employees in 95 countries, making it one of the largest technology companies in the world. Up until recently, the company’s main focus was on networks and cybersecurity, but Cisco has been expanding into areas such as cloud computing, artificial intelligence (AI), and machine learning (ML), particularly with the help of the Cisco Research division.

Working under Head of Cisco Research Ramana Kompella, Chief of Staff & Program Manager Carla Leigh says that the Cisco Research group is “trying to mesh together and be really cognizant about the best ways to bridge academia and industry.” Toward that goal, Cisco Research conducts and funds research in key areas including systems and networking, security and privacy, artificial intelligence, and quantum. Because of this focus on computer technology, engaging with MIT CSAIL was a natural fit for Cisco and later the subgroup Cisco Research.

For more information about CSAIL Alliances industry engagements, please visit:

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CISCO RESEARCH: BRIDGING INQUIRY AND INDUSTRY (cont.)

When asked about how the relationship with CSAIL Alliances began, Leigh says, “we just saw an alignment; we saw an opportunity and a great way to get involved with MIT.” In fact, the relationship between Cisco and CSAIL dates back to 2008 when they first joined the CSAIL Affiliates Program, which expanded to become CSAIL Alliances. After witnessing the success of previous engagement with CSAIL through the program, Leigh describes how, in her new role for Cisco Research, she and other members of the team found themselves asking: “how can we become even more closely aligned and work more closely with [CSAIL] faculty?” This question led them to join the CSAIL Alliances Research Initiative MachineLearningApplications@CSAIL, or MLA@CSAIL.

CSAIL ALLIANCES: MLA@CSAIL

CSAIL Alliances Research Initiatives were created to give companies an opportunity to connect more directly with both CSAIL researchers and other CSAIL Alliances members, exploring technical problems that do not yet have commercially viable solutions. These research initiatives are launched with 3-4 founding members who sit on an executive board which jointly creates problem statements and then votes on what researcher proposals—designed to address said problem statements—receive funding. In September 2020, Cisco became a founding member of the MLA@CSAIL Research Initiative, joining Retail Business Services (a subsidiary of Ahold Delhaize), Arrow Electronics, and SAP Innovation Center Network to help CSAIL researchers study the key question of how and when businesses should leverage machine learning in their enterprises for competitive advantage.

Head of Responsible AI Research at Cisco Research Dr. Ali Payani—who currently represents Cisco on the MLA@CSAIL executive board—says that being a part of MLA@CSAIL “helps me understand the topics of research and state-of-the-art happening at MIT,” which provides important perspective for him and his team. His role in particular is centered around incorporating principles of fairness, robustness, and ethical application to the AI solutions being considered by Cisco Research, a topic many CSAIL PIs are also exploring. Dr. Payani describes how he’s been able to take part in discussions with several CSAIL researchers such as Professor Fredo Durand, Senior Research Scientist Aude Oliva, and Research Scientist Amar Gupta, particularly at CSAIL Alliances events like the 2023 Annual Meeting.

Some of the research coming out of MLA@CSAIL has had a direct impact on Cisco Research, Dr. Payani explains, highlighting how the panel discussions he’s attended have helped him approach an open-source tool for responsible AI that his team has been building ([RAI](#)). He says, “I still have an ongoing discussion with some of the faculty—[CSAIL Research Scientist] Dr. Amar Gupta, for instance—and I’m engaging with them to see if we can incorporate some of the products that can be beneficial within Cisco.”

To Dr. Payani, one of the main advantages of taking part in a research initiative is the real-time access to ongoing projects. He explains, “when you fund projects through MLA@CSAIL, the faculty are basically conducting research on their own and your main point of feedback is through their paper that’s published after a couple of months. **But these talks and events are really helpful to have a more direct engagement and learn about these projects before they are reflected in those publications.**”

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FURTHERING CONNECTION WITH CSAIL: TECH TALKS, GIFTS, HIRING, AND MORE

Outside the MLA@CSAIL research initiative, Cisco has also engaged with CSAIL in a number of other ways. In November 2022, Dr. Ashish Kundu, Head of Cybersecurity Research at Cisco Research, presented a Tech Talk at CSAIL titled “Attacking batteries and beyond,” which covered how malicious actors can attack the energy sources of devices and the importance of understanding how different security services and cryptography processes behave at different levels of energy. Through this talk, Dr. Kundu connected with CSAIL Professor Sridhar Devadas and his students, which led to both a research gift to Professor Devadas’s lab and the hiring of one of his students as a Cisco Research intern. Professor Devadas is also joining an upcoming Cisco Research summit to present his work to the Cisco community. Dr. Payani says Cisco is happy to consider funding further research, particularly some of the MLA@CSAIL projects that were not picked during the latest proposal review. He says, “I think there are a lot of potential points of collaboration and that we can engage with the MIT faculty more directly and learn a lot from their achievements.”

Overall, Carla Leigh says, “**from a relationship standpoint, I really appreciate how [CSAIL Alliances] takes such a personable approach.**” Dr. Payani agrees, describing their Client Relations Coordinator Christiana Kalfas as “awesome” and “accommodating.” Of CSAIL Alliance’s methodology, Leigh says, “I’ve experienced a lot of different consortiums and worked with universities and your personalized approach is definitely unique, which is appreciated.”

LOOKING FORWARD

As MLA@CSAIL enters another year, Cisco Research is looking to “collaborate closely with academic researchers,” Leigh says, adding that their team is “trying to figure out those next set of businesses and technologies that Cisco as a whole should be pursuing.” On a granular level, Dr. Payani describes how this breaks into two specific agenda items: “One is to learn what’s happening within industry and within AI research, especially at top schools like MIT... The other part is, once we have knowledge about the specific problem, engagement can help us identify some specific PIs and research that can be beneficial to us.” In the areas of cybersecurity, cloud and edge computing, ML, and AI, Dr. Payani says “we are trying to incorporate a lot of new findings into the actual problems within Cisco and be the bridge between academia and Cisco products.”

Even though research is typically slow moving, Leigh says that the work they’re a part of is currently at a stage where it’s “moving really fast.” She explains how quickly key areas of research—such as generative AI—are changing and how the team has been able to shift with the trends, a process that, to Leigh, makes the work more exciting. Dr. Payani adds how satisfying it is to “engage with the talented PIs and students and learn about what’s happening in research.”

Leigh sums it up saying, “I’m looking forward to more engagement with MIT CSAIL.”



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