



## Member Success Case Study

# Capital One

It's hard to imagine many fields where data is more important than financial services and banking. More and more, transactions and financial interactions are occurring online, in real-time — which means data is an integral component both for how financial institutions provide services and experiences to their customers and for how they mitigate risk. As the world grows more interconnected — and when economic situations turn on a dime, like during the Covid pandemic — staying at the forefront of these considerations is an ever-increasing technological challenge.

Luckily for Capital One, the effective deployment of information technology is quite literally central to its [founding principle](#).

### ABOUT THE COMPANY

Originally launched in 1994, Capital One began as a credit card company. At the time, credit cards were much less ubiquitous than they are today. But Capital One saw a unique opportunity to leverage data and analytics to make important operational, business, and financial decisions, including understanding consumer spending patterns to deliver more relevant, customized financial products. Using sophisticated data analytics, computer models, and technology to get ahead of their competitors, Capital One was able to broaden the credit card market and grow themselves into the banking juggernaut they are today.

Now, Capital One is working hard to maintain and expand their edge.

Senior Director of Applied Machine Learning Research, Bayan Bruss says, “we are among the most technology-forward of all the big banks.” Indeed, they’ve made big investments toward ensuring they’re poised and ready to take advantage of breakthroughs in artificial intelligence, cloud computing, open-source technology, differential privacy and data management, etc.

“My team’s main objective is to identify areas where there’s been some rapid advance in machine learning — usually coming out of academia and industry labs — to continually enhance how we deliver more seamless, secure experiences to our customers,” Bruss explains.

So where better to look than MIT CSAIL?

### CONNECTING TO MIT:

#### **CSAIL Alliances, Machine Learning Applications, and MIT Future of Data Trust and Privacy**

As Bruss puts it, the biggest value Capital One has gained from their relationship with CSAIL Alliances is “access to this incredible talent pool.” Finding quality employees, whether they’re “machine learning engineers or data scientists or applied researchers, is absolutely critical to our ability to attract great talent and let them do their best, most impactful work on behalf of our millions of customers.”

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

[cap.csail.mit.edu](https://cap.csail.mit.edu)

## CONNECTING TO MIT *(continued)*

With that in mind, Bruss and his team have taken full advantage of the opportunities CSAIL Alliances offers, attending every poster session and annual meeting they can manage. Capital One even hosted their own [custom tech talk](#) in 2022 about Natural Language Processing for their virtual assistant, Eno. Tech talks are a great way for companies to present students and faculty with the kinds of problems they're working on and create a discussion around potential solutions. Capital One's talk inspired numerous students to inquire about job opportunities.

The success of this event also led to another way Capital One has been able to find talent: a unique PhD internship. While most internships are targeted to the undergraduate level, Capital One realized there was an opportunity to become more engaged with the accomplished graduate students at CSAIL, and Alliances helped them take this from idea to a competitive reality. With several remarkable applicants to consider, one wonders how they'll possibly decide.

Beyond recruitment, Bruss emphasizes the ability of CSAIL Alliances to bring people together, not just students but also faculty, industry members, and even government institutions. Bruss says, **“the ability to convene a broad group of stakeholders around specific problems is really interesting and I think a huge value that the Alliances provide.”**

For example, Bruss was able to connect with CSAIL professor Srinivas Devadas after a presentation, which led to a series of one-on-one meetings, which led to a collaboration on information technology exploring the potential to make relevant recommendations to customers while preserving the anonymity of their data. This simultaneous protection of both data privacy and data value is a potential win-win for both customers and the bank, one that was accelerated by the connections to faculty and researchers provided by CSAIL Alliances.

Capital One is also involved with not just one but two [CSAIL Alliance Research Initiatives](#): Future of Data, Trust, and Privacy and Machine Learning Applications. By being a part of these initiatives, Capital One can propose interesting industry challenges for the faculty to address and then vote on which proposals are funded. This gives them singular insight and influence on the kind of research that's being done at MIT CSAIL. Bruss calls the process of collaborating with CSAIL “iterative,” explaining how the cycle of academic exploration and industry testing can create something better for everyone involved. “It both refines the quality of the research and makes the research more impactful across society, which is ultimately what researchers want to be doing.”

Indeed, Capital One's involvement with CSAIL Alliances is a relationship that makes everyone happy. According to Client Relations Coordinator Christiana Kalfas, they're the kind of client that makes full use of their membership. She explains, “they see the value in CSAIL, I see the value in them being a part of CSAIL... really, there's not one space that they're not touching, which is great for the CSAIL community.”

Echoing Bruss, Kalfas is proud to say that Capital One is helping “cultivate the brightest minds in the world.” Erin Madden, Director, R&D University Partnership at Capital One, agrees. **“Our partnership with MIT CSAIL provides avenues for us to engage technology, data science, and business leaders across Capital One, building a culture of innovation,”** she noted. “Just this year, we have had numerous teams meet with faculty to learn about emerging research, and are looking forward to hosting CSAIL researchers in our Boston office this fall.”

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## GOING FORWARD

As “a company that relies on data for everything we do,” Bruss emphasized that improved machine learning is the next natural step for Capital One. But it’s important for Bruss to remember the company’s commitment to “putting humans at the center of every decision that we make.”

**“We don’t just want to disrupt things for the sake of disrupting things,”** he says.

It’s in this light that Bruss sees the work Capital One does with MIT as a way to improve lives. To him, financial services are “such a common, basic need [that] any advancement, any improvement, any new technology can have tremendous impact on millions and millions of people in the United States and abroad.” As a bank, Capital One will always place an emphasis on value. But Bruss points out, “if it makes things better for the customers, then it’s valuable to us.”

Bruss is excited for the coming years, where he plans to have **“even more engagement with [CSAIL] Alliances”** that will hopefully lead to new and exciting breakthroughs. He’s looking forward to more poster sessions, visits, coffee sessions, and faculty connections.

As Bruss says, working with MIT CSAIL “helps elevate our stature in the broader community” and “lets people know we’re serious about our investments in machine learning.”