



Member Success Case Study

DynamoFL

Machine learning is rapidly becoming a keystone of the modern economy. Everything from social media recommendations to medical AI depends on the ability of computers to make decisions based on previous experience. But the widespread use of these smart algorithms depends on one enormous factor: data.

In a world of practically limitless raw data, there are numerous problems that arise in the use of it, such as transfer costs and privacy concerns. Between GDPR-style laws and the inflating volume of information being produced in various machine learning endeavors, there's a clear need for a way to train algorithms that sidestep these issues.

[DynamoFL](#), an MIT CSAIL Startup Connect member, has addressed this need with a process called Federated Learning (FL), which trains AI by sharing the model itself instead of sharing data. Using DynamoFL, companies can train models faster, more efficiently, and in full compliance with international privacy restrictions.

Getting Their Start

As CEO and Co-Founder Vaikkunth Mugunthan tells it, DynamoFL began as the last chapter of his PhD thesis at MIT. When he first started his graduate studies under CSAIL Principal Research Scientist Lalana Kagal, he was more focused on theoretical privacy. But when a CSAIL Alliances poster session landed him a summer internship with JPMorgan, he was introduced to FL and the industry's need for such a technology. "A lot of companies had started using it," Dr. Mugunthan says, explaining how he became interested in "implementing something which had a real-world use." Already FL was taking off in finance and healthcare, so Dr. Mugunthan saw an opening for a "plug and play" tool that would be easy for companies to use.

It took some time for Dr. Mugunthan's idea to fully coalesce into a startup, but the signs were encouraging from the start. First, he had a [paper](#) published on a simulator for privacy-preserving and secure FL. Buoyed by this success, Dr. Mugunthan went on to hire a contractor to build a simple prototype and some individual components that could integrate with his algorithm, testing to see if he had the technical skills to match his vision for the product. When that went well, he partnered with MIT colleague Dr. Christian Lau as co-founder and together they began to build what would become DynamoFL.

He jokes that the "best part" was the number of companies who tried to hire him for his expertise upon graduation. After seeing his simulator and other work, they wanted Dr. Mugunthan's help building their own FL programs. This gave him "the confidence that I was one of the experts in the field" and that he could earn the trust of major companies.

Now DynamoFL is partnering with Fortune 500 businesses to test their tool in various industry functions. They went through the YCombinator startup accelerator and got "the first interview on the first day." Before Dr. Mugunthan had finished his PhD they were valued at \$35 million, and their [TechCrunch](#) feature brought a fresh wave of publicity. As a self-described "research-heavy" company, Dr. Mugunthan explains how their priority is to "hire masters or PhDs from the best schools" and become the most trusted name in the field of FL solutions.

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DynamoFL: A General-Use Tool

So what exactly do FL solutions look like? One application Dr. Mugunthan walked through is in finance, where privacy is of paramount importance. Being able to train, say, a chatbot using a wide array of user data could be useful to big banks and investing firms. But the snarl of international privacy laws makes the management of this information a headache. DynamoFL offers companies a way to share the model itself with sources, even internationally, with guaranteed legal compliance. The hypothetical chatbot can thus be trained and improved on local servers without ever risking client data or breaching consumer trust.

Another potential application of DynamoFL is in the automobile industry, specifically in the training of autonomous vehicles. As the sensors on self-driving cars become ever more precise, there will be a huge amount of useful data cars could be gathering while in use. However, the constant transfer of video data—potentially terabytes of information per hour—would create a prohibitive cost, no matter how useful the data might be. With a FL solution, the self-driving models can be trained on the car’s computer and only the model needs to be transferred back and forth, conferring its lessons to the company’s system and raising accuracy without incurring massive transfer expenses or breaching the privacy of pedestrians, drivers, etc. It’s a win-win solution for training autonomous AI models.

These are only a few examples of DynamoFL’s potential use cases. Dr. Mugunthan envisions the tool as a “personalized federated learning solution” which can help “any organization improve the performance of their machine learning models while preserving privacy.”

The CSAIL Connection

One thing Dr. Mugunthan is clear about is how much he attributes his success to Dr. Kagal and CSAIL. From the very beginning, it was Dr. Kagal’s encouragement that inspired him to take a chance and apply to MIT, and he describes his time at CSAIL as “a fantastic experience.”

“I really enjoyed the collaborative nature of projects,” he says, highlighting his ability to get a minor from Harvard and his deep roots in the CSAIL community.

For Dr. Mugunthan, his link to CSAIL is more than nostalgic; it’s a pivotal part of his company’s strategy. He says through MIT “we have access to the best talents in the world” and he’s excited to leverage his network for hiring. Already, DynamoFL is planning to launch several internships and create a DynamoFL ambassador program with CSAIL. Dr. Mugunthan adds, “I wouldn’t have been at this stage [without CSAIL], so I want to give it back as well.”

Beyond recruitment, DynamoFL is utilizing their connection with CSAIL Alliances to maximize the company’s exposure. Dr. Mugunthan was invited to present at one of the Alliances conferences, which led to “a good number of client leads” and helped Dr. Mugunthan understand specifically which companies were interested. “We were able to tailor our product toward what they needed,” he explains, which helped DynamoFL create even more market traction.

“CSAIL Alliances have been super helpful,” Dr. Mugunthan says, calling Sr. Client Relations Coordinator Philip Arsenault “a fantastic friend of mine.”

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Looking Forward

When asked what he's focused on next, Dr. Mugunthan's answer is simple: growth. He hopes DynamoFL's positive momentum will continue, which will allow him to get "the best clients and the best talent." Though he's no stranger to the challenge such growth entails. Having developed so quickly, Dr. Mugunthan describes the haste to find the right people to help DynamoFL onboard clients at a much faster rate. Product expansion and having dedicated resources for individual clients is a top priority as DynamoFL goes into the next rounds of investing, which is why he's looking forward to further engagements with CSAIL Alliances.

He says the end goal for DynamoFL is "to make sure that when it comes to privacy preserving machine learning, personalized machine learning, and federated learning, the first company that comes to anyone's mind is us." With that in mind, Dr. Mugunthan calls his association with MIT an "added advantage," showing clients that DynamoFL has the best people on the job.