Member Success Case Study | Written By: Audrey Woods

Bayer

In the dynamic and exciting realm of technological advancements, it can be easy to get caught up in the 'next big thing.' Media buzz around the latest chatbot or self-driving car can dominate the narrative, sometimes obscuring the ultimate goal of computer science: to make human lives better through technology. However, as our world becomes increasingly interconnected and our digital solutions become ever more innovative, the potential for leveraging computer-driven solutions to uplift lives, bolster health, and improve systems has never been greater.

CSAIL Alliances Affiliate member Bayer recognizes this potential, which is why they are focused on applying technology to solve global issues. VP of IT Strategy & Partnerships at Bayer Lily Wong explains that Bayer is proud to create products and services that help both people and our planet thrive, addressing the major challenges presented by a growing and aging population by taking breakthrough research and leveraging it for better market solutions.

One way Bayer is accomplishing this is by engaging with academic research institutions like MIT CSAIL.

BAYER: "SCIENCE FOR A BETTER LIFE"

Originally founded in 1863 when a dye salesmen and master dyer partnered to manufacture and sell synthetic dyestuffs, Bayer has grown into an internationally operating company represented in 83 countries with more than 100K employees and over $50B in annual revenue. Perhaps most famous for trademarking and distributing acetylsalicylic acid—also known as aspirin—Bayer is one of the largest and best-known life science and healthcare companies, with a wide variety of products, services, and research efforts.

Since 2016, Bayer has been structured into three divisions, each with its own impact and research focus. Bayer's Pharmaceutical Division works on the development and commercialization of innovative medicines and therapies. Bayer's Consumer Health Division distributes a range of over-the-counter medications, dietary supplements, and personal care products. Lastly, Bayer's Crop Science Division fosters a thriving innovation pipeline of solutions in seeds and traits, crop protection, and digital farming, with special attention paid to climate change and ways to decarbonize agriculture without impacting food production. With its purpose statement "Science for a better life," Bayer guides its employees to pursue innovations that will cure or entirely prevent disease, allow people to better care for their own health needs, and cultivate agricultural solutions that conserve our planet's natural resources. Specifically, Bayer's vision is: "Health for all, hunger for none."

Integrating computer science technology into this vision, Head of IT External Partnerships at Bayer Dr. Luis Muniz leads a team that aims to support Bayer employees with the knowledge, tools, and ecosystem necessary to maintain a competitive advantage in an increasingly digital world.

CONNECTING WITH CSAIL: FACULTY INTERACTIONS, RECRUITING, AND EVENTS

When Bayer first connected with CSAIL Alliances in 2021, it had a particular interest in crop science research and talent acquisition. Right off the bat, Bayer posed two technology challenges: (1) the need for machine learning models to maximize seed productivity and (2) their desire for new methods to collect and store data that maximized value and minimized cost. These specific problem statements led to calls with Professor David Karger, Senior Research Scientist John Fisher, Principal Research Scientist Una-May O'Reilly, and Research Scientist Amar Gupta, all exploring opportunities for collaborative engagements that could address these challenges and lead to potential solutions. Through these interactions, Bayer organized an in-person workshop with Principal Research Scientist O'Reilly on the application of a method called Adversary Learning to sustainability in plant science. This workshop highlighted how sustainability and volume/profit can be conflicting objectives and led to early project concepts for integrating sustainability into current practices using an Artificial Adversarial Intelligence approach. Bayer has also further explored a consultancy project with Research Scientist Amar Gupta on AI algorithms and techniques to accelerate Bayer's Consumer Health Innovation projects.

Beyond connecting with faculty and researchers, Bayer has been heavily invested in using their link to CSAIL for talent acquisition and hiring. Early on, Bayer took a keen interest in the student profile handbook—a member-only resource—and posted several jobs on the CSAIL Alliances website, where more than 100 Bayer employees have active accounts. Recognizing the talent pool MIT has to offer, Bayer has used their association with CSAIL to recruit top researchers and scientists and push their mission forward. In addition to bringing in new talent, Bayer is also using MIT professional development courses offered through CSAIL Alliances to level up their existing workforce, encouraging their staff to take classes such as Artificial Intelligence: Implications for Business Strategy, Human-Computer Interaction for User Experience Design, and Machine Learning in Business.

In a similar vein, when it comes to maintaining a vibrant and fruitful relationship with CSAIL, Bayer is sure to take advantage of the CSAIL Alliances events, both in-person and virtually. Dr. Muniz says that the 2023 CSAIL Alliances Annual Meeting "was timely with the theme of Generative AI" and offered Bayer practical insights into the applications, challenges, environmental impact, and security concerns of such technologies. Dr. Muniz also highlights how Bayer employees have benefited from the CSAIL Alliances First Friday Lunch series (now known as Byte Bites), a monthly discussion hosted by a CSAIL researcher about their most recent work and projects. To Dr. Muniz and his team, "these events enable us to stay informed about emerging trends, identify potential collaborations, and gain insights into technological breakthroughs that can impact our business." IT Innovation Manager Frank Dietz agrees, emphasizing the importance of sessions—either in-person or remote—that are "on the edge between research and concrete application," which allows their team to accurately evaluate the value of emerging technologies for Bayer's business processes.

Speaking generally about Bayer's relationship with CSAIL Alliances, Lily Wong concludes, "**Bayer is always looking for opportunities to consider and explore disruptive and innovative technologies. This relationship provides Bayer colleagues with access to continual learning opportunities and is also important to helping the industry—and future employees—realize that Bayer isn't just an R&D company but also a digital company**."

GOING FORWARD

Now, more than two years into its relationship with CSAIL Alliances, Bayer is looking to grow its presence at CSAIL. Bayer plans to host a Tech Talk at CSAIL soon to provide the MIT community with insight into the focus areas and challenges Bayer is working on, as well as open a conversation with both students and PIs that could lead to future collaboration. Bayer also wants to invite members of CSAIL to join events at its Cambridge office to further deepen the connection. Through these efforts and continuing outreach to students, faculty, and researchers at CSAIL events, Bayer plans to actively participate in and benefit from the innovative research happening in the Stata Center. As Dietz says, "**I think an open exchange with your community as well as other CSAIL members helps us all to have a real impact on the big questions**."

Overall, Dr. Muniz says "we are living in interesting times" when it comes to technologies like artificial intelligence and machine learning. Such advancements have the capacity to "push the boundaries of what is possible" and fundamentally change our world, our systems, and how we live. The interdisciplinary nature of AI and related fields means that collaboration—both within Bayer's divisions and between Bayer and academic institutions—is necessary to bring together professionals from diverse backgrounds to solve these big problems. For Dr. Muniz, being in this space and leading external engagement, such as Bayer's relationship with MIT CSAIL, "means having the opportunity to partner/engage with groundbreaking solutions that can shape the future."