Message from the Director
Prof. Daniela Rus

For more than 50 years, the MIT Computer Science and Artificial Intelligence Laboratory (CSAIL) has pioneered new approaches to computing that improve how people work, play, and learn. Now, we stand on the verge of an exciting new era with potential to translate that work into monumental new contributions.

Call me an optimist, but I can picture a world—not too far off—where it's as easy to program a robot to deliver groceries or take a driverless car for a spin as it is to use a smartphone today. Can you imagine if every child had their own personal machine tutor to support them in how they learn? If data about health gave every person access to individualized treatment plans? Or if our smart cities could ensure that we never get stuck in traffic?

At CSAIL, we do more than imagine that world. We work to build it.

CSAIL has always been about moonshots and big dreams. Our researchers have developed the first time sharing computer system, started the field of artificial intelligence, developed the first computer to display graphics, the first computer conversationalist (Eliza) and, more recently, the first natural language understanding systems that recommend and explain diagnoses to doctors. The first large-scale computer-algebra system (Macsyma), the first video phone, the first motion microscope, the first practical algorithms for homomorphic encryption, the first databases for IOT devices, and the first mobile robots have been developed at CSAIL. If you have ever connected your laptop using an Ethernet port, logged into your email, shopped online, or gotten a good movie recommendation from Netflix, you have benefited from the work of our researchers on the invention of Ethernet, computer passwords, RSA encryption, and the World Wide Web. Today, students around the world have access to education through edX, a massively open online course platform that grew out of technology developed at CSAIL. These are only a few of the long list of firsts created by members of our laboratory.

Today, CSAIL is a vibrant community of inventive problem solvers across the fields of science, engineering, and technology, with approximately 1000 members including 500 graduate students and postdocs and 116 faculty representing 11 different academic departments. Our CSAIL members are engaged in 900 research projects that push the boundaries of what's possible—innovating new ways for computing to improve people's lives and creating technology-focused companies to deploy our ideas. The CSAIL distinguished faculty includes 8 Turing Award laureates, 7 MacArthur Award winners, and 67 members of the national academies.

This research aims to transform computer science fiction into science by embodying the MIT's motto, *mens et manus* – mind and hand – to develop the theoretical foundations of computing and illustrate how computing integrates into the fabric of everyday life. Our current research includes using computation to understand human intelligence and then creating machines that learn like humans; finding ways to integrate robots into our everyday life; developing a worldwide information infrastructure that respects privacy and hack-free security systems; continuing to seek improvements in computing as we move past Moore's law (including automating how we make machines), and finding better ways to teach computational thinking and making; using computation to give us superhero capabilities like vision magnification (and doing this as we move past wearables to 'invisibles'); using nature to inspire the inter-connected world, and using computation to help us understand nature; accelerating the development of systems that learn, and using that to help us with critical tasks like diagnosing, monitoring, and treating disease.

CSAIL nurtures the careers of its member students, faculty, and staff, emphasizing service, collegiality, mentorship, and self-improvement. Our students, faculty, and staff work together to achieve excellence in all aspects of our research, education, and enterprise services. We mentor our students and post-doctoral fellows pursuing computer science research. We are proud of what we have accomplished and understand that progress is not possible without an open mind. At the same time, we are an important part of MIT and proud to serve MIT by exploring the application of computing to other scientific disciplines.

Our CSAIL community is not afraid to push the boundaries of what's possible! For us, no question is too crazy, no future too far off. We take pride in imagining the impossible, and then looking for ways to make it possible. For over 50 years, this has been one of the greatest strengths of our incredibly passionate, collaborative, visionary researchers, and I know that will be just as true of the next 50 years. As we work towards a future where computing empowers people and enhances all future experiences, I can't wait to see the incredible discoveries that our CSAIL community makes along the way.