**MIT-News-February 2019 - The future of education in a world of pervasive computing**

Conference celebrating new MIT Schwarzman College of Computing explores the changing face of higher ed.

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[Press Inquiries](http://news.mit.edu/2019/schwarzman-college-computing-conference-0228#press-inquiry-section)

Computers have become so pervasive in today’s world that preparing students to work and assume leadership roles in this shifting landscape requires giving them a better understanding of how computers work, how to use them, and how they affect every aspect of society. That’s the reasoning behind the creation of the new MIT Stephen A. Schwarzman College of Computing, and it was the theme of many of the presentations and panel discussions in this week’s [three-day celebration](https://helloworld.mit.edu/) of the new college.

“We’re in the midst of a global transformation that’s catalyzed by the rapid acceleration of digital technologies, including unprecedented access to computation and data,” said Farnam Jahanian, president of Carnegie Mellon University, in a keynote address on Wednesday. “The scale and scope and pace of these advances are truly unprecedented in human history.”

“The impact of these technologies is ubiquitous,” he said, “with a wide range of applications from health care to transportation, finance, energy, manufacturing, and far beyond. … The pace of innovation is accelerating dramatically.”

These changes require a profound rethinking of the role of education in this rapidly changing environment, Jahanian said. “Imagine a day when by integrating emerging technologies, such as AI-enabled learning techniques and inverted classrooms, we can achieve personalized, outcome-based education,” he said.

MIT Provost Martin Schmidt, in a discussion with reporters, said that in creating the MIT Schwarzman College of Computing, “one of the things that’s really critical to us is that not only should this advance computation, but it should really link to all the disciplines across the campus.” The college will “strengthen those disciplines in their use of these new tools,” he said, “but also when we learn things about how we apply those tools to the disciplines, that knowledge flows back … and informs the next generation” of computing research.

Schmidt added that in planning the new college, a key question was how MIT will deliver on its promise of making sure that the college “has in its DNA” an awareness of the societal impact of current and future advances in computing. This appreciation “should inform our educational agenda, what our undergraduates and graduates learn in the classroom, and it should inform our research agenda,” he said. “It should shape how the research is performed, and the kind of content we produce that informs policies and informs governments on how they should respond to the deployment of these technologies.”

The new college was founded partly in response to the fact that “there really was a transformation occurring across the campus,” with computation increasingly forming a key part of the work in amost all disciplines, Schmidt said. While about 40 percent of MIT students major in computer science, there was a clear need for an even greater integration of computation and data science early and deeply into every aspect of education.

Melissa Nobles, dean of MIT’s School of Humanities, Arts and Social Sciences, who also participated in the discussion, told reporters that students in that school were very excited to take part in this increased integration of their disciplines with computation. She cited examples of classes where mixed groups of computer science students and those majoring in arts, economics, or literature worked on problems that combined their different kinds of expertise. In one class, for example, the students studied in exhaustive detail the way writers of 19th century novels used male and female pronouns and how that related to the genders of the author and the main characters. The project required both computer expertise to analyze thousands of texts, and a knowledge of the literature in order to provide context for their findings.

Also during the discussion, Maria Klawe, president of Harvey Mudd College in California and another keynote speaker, pointed out that a deep understanding of computers and their impact is increasingly needed in a rapidly changing world where it is estimated that many of the jobs people perform today “are just going to disappear” within the next few decades. That makes interdisciplinary education more important than ever, she said.

Regarding the creation of the new college, she said, “I see this as an incredibly important step for MIT, and I think it’s going to influence other institutions to do similar things.”

The goals of the college reach far beyond just helping people in other disciplines to use computers more effectively, Nobles and others emphasized. It’s also important, they said, to make sure that the skills and knowledge from other fields flow back into computer science, influencing the ethical, political, and social implications of the work in that field — not just as an afterthought but as a fundamental part of thinking and planning.

For example, while it is tempting to make use of massive sets of data collected by social media, the use of such datasets can raise serious concerns about privacy and informed consent. Such issues may be relatively new territory for computer scientists, but they are longstanding issues that have been dealt with extensively by social scientists and philosophers whose expertise can help inform the data collection and analysis procedures.

The speakers at Wednesday’s symposium, representing many different fields and institutions, shared a sense of excitement about the potential for the MIT Schwarzman College of Computing to bring about significant innovations. “MIT continues to be a world-class institution that offers a distinctive education and research, of course,” Jahanian said in his keynote, “and this latest development will certainly increase its impact in this changing world.”

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