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Head

Stanford to host 100-year study on artificial intelligence

Subhead

Stanford University will lead a 100-year effort to study the long-term implications of artificial intelligence in all aspects of life.

By Chris Cesare | Stanford Engineering

Stanford University has invited leading thinkers from several institutions to begin a 100-year effort to study and anticipate how the effects of artificial intelligence will ripple through every aspect of how people work, live and play.

This effort, called the One Hundred Year Study on Artificial Intelligence, or AI100, is the brainchild of computer scientist and Stanford alumnus Eric Horvitz who, among other credits, is a former president of the Association for the Advancement of Artificial Intelligence.

In that capacity Horvitz convened a [conference in 2009](#) at which top researchers considered advances in artificial intelligence and its influences on people and society, a discussion that illuminated the need for continuing study of AI's long-term implications.

Now, together with Russ Altman, a professor of bioengineering and computer science at Stanford, Horvitz has formed a committee that will select a panel to begin a series of periodic studies on how AI will affect automation, national security, psychology, ethics, law, privacy, democracy and other issues.

"Artificial intelligence is one of the most profound undertakings in science, and one that will affect every aspect of human life," said Stanford President John Hennessy, who helped initiate the project. "Given Stanford's pioneering role in AI and our interdisciplinary mindset, we feel obliged and qualified to host a conversation about how artificial intelligence will affect our children and our children's children."

Faculty expertise

Five leading academicians with diverse interests will join Horvitz and Altman in launching this effort. They are:

- Barbara Grosz, the Higgins Professor of Natural Sciences at Harvard University and an expert on multi-agent collaborative systems;
- Deirdre K. Mulligan, a lawyer and a professor in the School of Information at

the University of California, Berkeley, who collaborates with technologists to advance privacy and other democratic values through technical design and policy;

- Yoav Shoham, a professor of computer science at Stanford, who seeks to incorporate common sense into AI;
- Tom Mitchell, the E. Fredkin University Professor and chair of the machine learning department at Carnegie Mellon University, whose studies include how computers might learn to read the Web; and
- Alan Mackworth, a professor of computer science at the University of British Columbia and the Canada Research Chair in Artificial Intelligence, who built the world's first soccer-playing robot.

Altman will serve as faculty director and both he and Horvitz will be ex officio members of the committee. Together, the seven researchers will form the first AI100 standing committee. It and subsequent committees will identify the most compelling topics in AI at any given time, and convene a panel of experts to study and report on these issues.

Horvitz envisions this process repeating itself every several years, as new topics are chosen and the horizon of AI technology is scouted.

"I'm very optimistic about the future and see great value ahead for humanity with advances in systems that can perceive, learn, and reason," said Horvitz, a distinguished scientist and managing director at Microsoft Research who initiated AI100 as a private philanthropic initiative. "However, it is difficult to anticipate all of the opportunities and issues, so we need to create an enduring process."

Horvitz turned to Stanford to host the study for a variety of reasons, including his own background, which involved studying computer science and medicine at Stanford.

Altman, who studied computer science and medicine with Horvitz at Stanford in the late '80s, said a university is the best place to nurture such a long-term effort.

"If your goal is to create a process that looks ahead 30 to 50 to 70 years, it's not altogether clear what artificial intelligence will mean, or how you would study it," Altman said. "But it's a pretty good bet that Stanford will be around, and that whatever is important at the time, the university will be involved in it."

Mackworth said, "This study will provide a forum for us to consider critical issues in the design and use of AI systems, including their economic and social impact."

Mulligan is particularly interested in the latter. "The 100 year study provides an intellectual and practical home for the long-term interdisciplinary research necessary to document, understand, and shape AI to support human flourishing and democratic ideals."

Grosz welcomes the project's potential for discussions.

"I'm excited about the potential for AI100 to focus attention on ways to design AI to work with and for people," she said. "We can shift the discussion about the societal impact of AI from the extremes to positions that take into account the nuances of societal values, human cognitive capacities, and actual AI capabilities."

Mitchell embraces the coming advances.

"We won't be putting the genie back in the bottle," he said. "AI technology is progressing along so many directions and progress is being driven by so many different organizations that it is bound to continue. AI100 is an innovative and far-sighted response to this trend – an opportunity for us as a society to determine the path of our future and not to simply let it unfold unawares."

Shoham adds that the 100-year study will help to identify challenges as well as concerns.

"The complexities of the field have tended to give rise to uninformed and misguided perceptions and commentaries," Shoham said. "This long-term study will help create a more accurate and nuanced view of AI."

AI100 is funded by a gift from Eric and Mary Horvitz. They envision that the program, with its century-long chain of standing committees, study panels and growing digital archive, will remain a center of vigilance as the future unfolds.

"We're excited about kicking off a hundred years of observation and thinking about the influences of artificial intelligence on people and society," said Horvitz. "It's our hope that the study, with its extended memory and long gaze, will provide important insights and guidance over the next century and beyond."

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