Free computer science courses, new teaching technology reinvent online education

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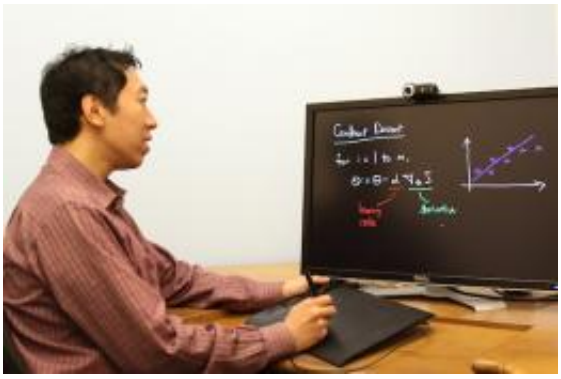

Computer Science professor Andrew Ng uses tablet-recording technology he developed to instantly display notes for his interactive video lecture.

Stanford Engineering professors are offering three of the school's most popular computer science courses for free online this fall, and at the same time launching an experiment that could transform the way online education is delivered.

The professors are taking technologies designed to enhance learning for Stanford students and extending them to a broad online audience. They are delivering lectures as short, interactive video clips that allow students to progress at their own pace through course materials. They are offering live quizzes with instant feedback. And they are testing new technologies that allow students to rank questions that should be posed to the instructors.

The professors also hope to extend the benefits of Stanford-style education to those who lack access.

“Both in the United States and elsewhere, many people simply do not have access to a high-quality education. By putting out this initial set of courses, we hope to teach some of the latest computing technologies to anyone who wants to learn it – for free,” said Andrew Ng, an associate professor of computer science who is teaching a new online machine learning course.

The three courses – Machine Learning, Introduction to Artificial Intelligence and Introduction to Databases – cover material that forms the basis of some of the most prevalent technologies today, from online shopping to web search and robotics.

“By opening up education, we hope to give more learning, job and advancement opportunities to anyone who wants them,” said Computer Science Department Chair Jennifer Widom, who is teaching the database course.

Demand has been enormous. Already more than 58,000 people have expressed interest in the artificial intelligence course taught by Sebastian Thrun, a Stanford research professor of computer science and a Google Fellow, and Google Director of Research Peter Norvig.

“The time is right for this – technology has progressed, connectivity has progressed and video has progressed,” Thrun said. “It’s thrilling to be able to take Stanford education out into the world to people who can’t afford it or wouldn’t have access.”

Formal registration for the classes kicks off today; classes start on Oct. 10 and extend through December. All three are being offered in partnership with the Stanford Center for Professional Development

(SCPD), which brings more than 40 years of distance-learning expertise to the table. Both SCPD students and regular Stanford students, as well as the general public, will have access to the new online learning tools.

Students in the free courses are expected to read course materials, complete assignments and take quizzes and an exam. Thrun said online students should expect to devote at least 12 hours a week to the artificial intelligence course, just as Stanford students do. What online students won't receive, however, is one-on-one interaction with professors, the full content of lectures – or a Stanford degree.

The online courses build on recent innovations by Stanford professors to increase interaction with students. These include ClassX, a video processing platform that facilitates lecture recording; CourseWare, an online course hosting site with social networking features; and OpenClassroom, a web platform designed to share Stanford lectures freely with the world.

In January 2010, computer science Professor Daphne Koller piloted the idea of shifting classroom time from lectures – which are largely passive activities for students – to more engaging activities. She recorded lectures as short videos for students to watch online and used class time to solve problems, host guest lecturers from the technology industry and review material students found difficult.

"The idea was to improve both the classroom experience and the online experience," she said.

She incorporated questions and quizzes into the videos to keep students thinking about the material and help them learn more effectively.

"One of the disadvantages of traditional instruction is how long it takes to get feedback on your work," said Ng. "If you submit homework and

get a graded version back a week later, you may already have forgotten much of what you did. With technologies that give you immediate feedback, a student can immediately determine what they do and don't understand, and more efficiently focus their efforts."

Provided by Stanford University