Robots unlikely to take big bites out of employment, expert says

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The role of robots in future labor markets will be the subject of a lecture by Purdue economics professor David Hummels at the upcoming "Dawn or Doom" conference. The conference, which will examine the role of several rapidly expanding technologies in society, will be Sept. 18 and is free and open to the

public. Credit: Purdue University image

Advances in artificial intelligence and robotics mean that machines will soon be able to do many of the tasks of today's workers. And not just blue collar jobs in areas such as manufacturing, but even in such white collar occupations as lawyers, doctors and – gulp – journalists.

A new viral video titled "Humans Need Not Apply," which has garnered more than 2 million YouTube views in just over two weeks, says that the new robots will be smart enough to take jobs even in occupations normally thought of as being incompatible with automation.

But David Hummels, a professor of economics at Purdue University, says humans still have a unique advantage that machines may never be able to emulate: our ability to respond to other humans.

"We have evolved over 100,000 years to be exquisitely perceptive to visual and aural cues from other people around us, which is an important skill that machines may never be able to match," Hummels says.

In addition, Hummels says evolutionary adaptation has created in humans extraordinary sensorimotor skills that are key components of many occupations. Elevating machines to the point where they could perform jobs, like construction work, that require manual dexterity would require a great deal of innovation.

"Although we talk about innovation quite a bit, and every company claims to be doing it, path-breaking innovation of the sort necessary to solve problems like dexterous machines is actually quite rare and expensive," he says.

Hummels will discuss the labor market consequences of automation and robotics in a lecture titled "Man Versus Machine and the Future of Work" during a conference at Purdue called "Dawn or Doom: The New Technology Explosion."

The Dawn or Doom conference is Sept. 18 on Purdue's West Lafayette campus and is free and open to the public.

According to Hummels, history shows plenty of examples of advancing technologies displacing workers in many areas.

"For example, in 1850 two-thirds of the people in the United States were employed in agriculture, providing our nation's food," Hummels says. "Now farmers are less than 2 percent of our labor force. When mechanization and automation replaces workers, economies find something else for people to do."

As the video points out, white collar, so-called "knowledge" workers are also already being replaced by robots in areas such as journalism. The Associated Press, for example, uses robots to write simple business stories, and The Los Angeles Times uses robot reporters to write about earthquakes. Following a quake last spring, the robot wrote a story about the quake in less than three minutes – significantly faster than any human could have written it.

The global economy has seen eras of disruptive change before - from the introduction of machines and industrial processes, from electricity, from automobiles, and from personal computers and the Internet. Some occupations disappeared, but new jobs arose from the change.

"One of the fundamental problems with the video and similar books and articles is that they claim that innovation is getting faster and faster, and cheaper and cheaper, and that we're going to lose the ability to control

it," Hummels says. "That's just not consistent with any historical evidence we have. When there are large breakthroughs, like electrification or computers, you see initial waves of innovation to take advantage of these fundamental technologies. When you're caught up in it, that wave looks unstoppable. But it eventually recedes."

Hummels says that machines will be better than people at an increasing number of tasks. People, however, still have a large advantage when interacting with other people, because it's a trait that has been fine-tuned through evolution.

"We are social animals, and that matters to consumers. Take a pediatrician, for example. IBM's Watson and other expert systems are being developed to diagnose and provide a course of treatment for illness and disease. But when a parent brings their child to the doctor's office, they want a trained individual to reassure them and tell them that their child is going to be okay. They don't want to hear that from a machine.

"So what we'll see are people working in concert with machines, which is something that happens quite a bit already. The laptop computer on my desk does a terrible job of conducting research or teaching students, but it makes me better at both jobs when I use it."

Despite his optimism, Hummels says there will be some people and occupations that will lose out in the coming change.

"For some people it's already happening," he says. "If we look at wages in the U.S. from 2000 to 2010, the only groups who consistently saw an increase in salaries were people with advanced degrees, such as doctors, lawyers and people with PhDs. Everyone else, including people with bachelor's and master's degrees, saw a decline in wages. This was especially true for people at the low end of the education spectrum who have a high school degree or less."

Among the people who will have a disadvantage in the nearly-here robot economy:

* Men, who have two distinct disadvantages: Many men have historically been employed to do jobs that require strength, and robots and other forms of automation will replace many of these jobs because they are stronger and never get tired.

Second, many jobs in the future will require interpersonal skills such as empathy, caring and even affection. Occupations that use these skills are dominated by women. If men are unable or unwilling to improve interpersonal skills they will find it hard to compete in the job market.

* People without advanced degrees: As repetitive and physical jobs are replaced by automation, more emphasis will be placed on people who can solve problems and develop and market new products, Hummels says. Many of these types of jobs require a high level of cognitive ability and skill sets developed while pursuing college and advanced degrees.

* People with repetitive jobs: "A robot can install a windshield in a car factory because it does precisely the same thing over and over in an environment that never changes," Hummel says. "Robots will not be used to replace broken windshields at auto shops because too much about the environment (the type of car, the condition of the broken window) changes every time."

* "People who do stand-alone tasks: "If your job combines sensorimotor skills or human interaction with other tasks that a computer/robot might do, you might still be well-protected if it's hard to unbundle the former from the latter. (Think of the pediatrician)," Hummels says.

* People with poor interpersonal skills: As robots and computers replace many back-room jobs, humans will retain advantages in interacting with

the public and working with colleagues on teams. This will place more emphasis on hiring people who are both technically proficient and have good interpersonal skills.

"There are some rarefied skills that you need in teams and, currently, you might have to put up with a pompous jerk because they have skills that we need," Hummels says. "As advanced automation allows machines to to do many of these tasks, especially in white collar jobs, we won't have to work with the jerks any longer. If I'm an employer and I have an employee who's a jerk, I'll send them on down the road."

Provided by Purdue University