As Robots Grow Smarter, American Workers Struggle to Keep Up

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A machine that administers sedatives recently began treating patients at a Seattle hospital. At a Silicon Valley hotel, a bellhop robot delivers items to people’s rooms. Last spring, a software algorithm wrote a breaking news article about an earthquake that The Los Angeles Times published.

Although fears that technology will displace jobs are at least as old as the Luddites, there are signs that this time may really be different. The technological breakthroughs of recent years — allowing machines to mimic the human mind — are enabling machines to do knowledge jobs and service jobs, in addition to factory and clerical work.

And over the same 15-year period that digital technology has inserted itself into nearly every aspect of life, the job market has fallen into a long malaise. Even with the economy’s recent improvement, the share of working-age adults who are working is substantially lower than a decade ago — and lower than any point in the
Economists long argued that, just as buggy-makers gave way to car factories, technology would create as many jobs as it destroyed. Now many are not so sure.

Lawrence H. Summers, the former Treasury secretary, recently said that he no longer believed that automation would always create new jobs. “This isn’t some hypothetical future possibility,” he said. “This is something that’s emerging before us right now.”

Erik Brynjolfsson, an economist at M.I.T., said, “This is the biggest challenge of our society for the next decade.”

Mr. Brynjolfsson and other experts say they believe that society has a chance to meet the challenge in ways that will allow technology to be mostly a positive force. In addition to making some jobs obsolete, new technologies have also long complemented people’s skills and enabled them to be more productive — as the Internet and word processing have for office workers or robotic surgery has for surgeons.

More productive workers, in turn, earn more money and produce goods and services that improve lives.

“It is literally the story of the economic development of the world over the last 200 years,” said Marc Andreessen, a venture capitalist and an inventor of the web browser. “Just as most of us today have jobs that weren’t even invented 100 years ago, the same will be true 100 years from now.”

Yet there is deep uncertainty about how the pattern will play out now, as two trends are interacting. Artificial intelligence has become vastly more sophisticated in a short time, with machines now able to learn, not just follow programmed instructions, and to respond to human language and movement.

At the same time, the American work force has gained skills at a slower rate than in the past — and at a slower rate than in many other countries. Americans between the ages of 55 and 64 are among the most skilled in the world, according to a recent report from the Organization for Economic Cooperation and Development. Younger Americans are closer to average among the residents of rich countries, and below average by some measures.

Clearly, many workers feel threatened by technology. In a recent New York Times/CBS News/Kaiser Family Foundation poll of Americans between the ages of 25 and 54 who were not working, 37 percent of those who said they wanted a job said technology was a reason they did not have one. Even more — 46 percent —
cited “lack of education or skills necessary for the jobs available.”

Self-driving vehicles are an example of the crosscurrents. They could put truck and taxi drivers out of work — or they could enable drivers to be more productive during the time they used to spend driving, which could earn them more money. But for the happier outcome to happen, the drivers would need the skills to do new types of jobs.

The challenge is evident for white-collar jobs, too. Ad sales agents and pilots are two jobs that the Bureau of Labor Statistics projects will decline in number over the next decade. Flying a plane is largely automated today and will become more so. And at Google, the biggest seller of online ads, software does much of the selling and placing of search ads, meaning there is much less need for salespeople.

There are certain human skills machines will probably never replicate, like common sense, adaptability and creativity, said David Autor, an economist at M.I.T. Even jobs that become automated often require human involvement, like doctors on standby to assist the automated anesthesiologist, called Sedasys.

Elsewhere, though, machines are replacing certain jobs. Telemarketers are among those most at risk, according to a recent study by Oxford University professors. They identified recreational therapists as the least endangered — and yet that judgment may prove premature. Already, Microsoft’s Kinect can recognize a person’s movements and correct them while doing exercise or physical therapy.

Other fields could follow. The inventors of facial recognition software from a University of California, San Diego lab say it can estimate pain levels from children’s expressions and screen people for depression. Machines are even learning to taste: The Thai government in September introduced a robot that determines whether Thai food tastes sufficiently authentic or whether it needs another squirt of fish sauce.

Watson, the computer system built by IBM that beat humans at Jeopardy in 2011, has since learned to do other human tasks. This year, it began advising military veterans on complex life decisions like where to live and which insurance to buy. Watson culls through documents for scientists and lawyers and creates new recipes for chefs. Now IBM is trying to teach Watson emotional intelligence.

IBM, like many tech companies, says Watson is assisting people, not replacing them, and enabling them to be more productive in new types of jobs. It will be years before we know what happens to the counselors, salespeople, chefs, paralegals and researchers whose jobs Watson is learning to do.
Whether experts lean toward the more pessimistic view of new technology or the most optimistic one, many agree that the uncertainty is vast. Not even the people who spend their days making and studying new technology say they understand the economic and societal effects of the new digital revolution.

When the University of Chicago asked a panel of leading economists about automation, 76 percent agreed that it had not historically decreased employment. But when asked about the more recent past, they were less sanguine. About 33 percent said technology was a central reason that median wages had been stagnant over the past decade, 20 percent said it was not and 29 percent were unsure.

Perhaps the most worrisome development is how poorly the job market is already functioning for many workers. More than 16 percent of men between the ages of 25 and 54 are not working, up from 5 percent in the late 1960s; 30 percent of women in this age group are not working, up from 25 percent in the late 1990s. For those who are working, wage growth has been weak, while corporate profits have surged.

“We’re going to enter a world in which there’s more wealth and less need to work,” Mr. Brynjolfsson said. “That should be good news. But if we just put it on autopilot, there’s no guarantee this will work out.”

Some say the nature of work will need to change. Google’s co-founder, Larry Page, recently suggested a four-day workweek, so as technology displaces jobs, more people can find employment. Others believe the role of the public sector should expand, to help those struggling to find work. Many point to education, in new technologies and in the skills that remain uniquely human, like creativity and judgment.

“The answer is surely not to try to stop technical change,” Mr. Summers said, “but the answer is not to just suppose that everything’s going to be O.K. because the magic of the market will assure that’s true.”

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