

'Thinking Machines' warns of time when machines do everything

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This time is different. In the six decades since the first colloquium on artificial intelligence (AI) at Dartmouth College, periodic predictions about changes implied by AI often proved to be enthusiastic speculation, more science fiction than reality. No longer. Today fields of AI, robotics and evolving technologies permeate economies. There are immediate implications for human beings regarding employment, income, education and social relations. There is a promise of material abundance and an end to drudgery. But certain urgent questions have not yet found ethically and politically palatable answers.

How does a society that espouses democracy ensure a just distribution of wealth made available by increased technical efficiency and machine intelligence? Current social and economic structures exacerbate inequities. Traditional notions of work and workplace are in flux. The gig economy is supplanting long-term employment opportunities. Many experience a sense of insecurity. Others, outright despair. Meanwhile the obscenely wealthy are becoming a planetary elite, having little in common with average citizens in their respective countries.

Not all is due to technological change, but it is undoubtedly a factor. In his recent book "Thinking Machines," journalist Luke Dormehl presents a crisp overview of the history and ongoing challenges of AI and robotics. Eniac (Electronic Numeric Integrator and Calculator) was "the world's first programmable computer" which weighed 30 tons and could perform "20,000 multiplications per minute." This "giant brain," as it was called, arrived just after World War II and was housed at the University of Pennsylvania. It captured the imagination of press and public. The era of the computer had begun.

Dormehl provides sketches of brilliant

scientific pioneers such as John von Neumann, Claude Shannon and Alan Turing who made initial inroads in AI. Turing's story is especially poignant. A British mathematician and cryptanalyst, Turing cracked the secret codes of the German war machine contributing to the defeat of Nazism. This achievement offered little protection when Turing, a gay man, was prosecuted in 1952 for homosexuality, then a crime in England. "Forced to choose between prison and painful chemical castration, Turing opted for the latter." In 1954 he took his own life. He later received a posthumous pardon. Dormehl's narrative is replete with other brilliant and sometimes quirky characters.

The word "robot" entered the lexicon in 1921. "R.U.R. (Rossum's Universal Robots)," a play by Karel Capek, introduced the term derived from the Czech word "robota" meaning "forced labor." Industrial robots are now used in a variety of manufacturing. Their use will expand as the ranks of human workers who once had such critical roles in production will be thinned out. It is not simply rote and repetitive tasks that AI and robotics perform. A lot of people earn their living driving a vehicle. Self-driving cars and trucks are expected to become ubiquitous and in the process a significant sector for employment will be severely curtailed. Even highly skilled and well-educated professionals — once thought safe from cybernetic threats — are no longer guaranteed immunity from the encroachment of machine intelligence.

"As we've seen, the past few years have ushered in extraordinary advances concerning what machines are capable of," writes Dormehl. "Machines have become not simply tools to increase the productivity of human workers, but the workers themselves. Computers are still at their best when it comes to dealing with routine tasks in which they follow explicit rules. However, advances in AI mean that the scope of what is considered routine has

become far broader." One recent study has predicted that close to half of today's jobs in the U.S. are likely to be affected by automation within the next 20 years. Not just low-skilled workers but "high-cognition professionals like doctors and lawyers" will be impacted by AI. Will new kinds of paid work replace the many jobs that will be eliminated or drastically transformed by technological change? There is no sure answer.

As far back as 1930, the displacement of human labor by machinery concerned economist John Maynard Keynes, who coined the phrase "technological unemployment." Indeed what happens to a society when growing numbers of citizens find themselves no longer needed for jobs previously performed for pay? Dormehl relates the story of 16th century inventor William Lee, who constructed a "stocking frame knitting machine."

Queen Elizabeth I witnessed the machine in action but would not grant Lee a patent, stating, "Consider thou what the invention could do to my poor subjects. It would assuredly bring to them ruin by depriving them of employment, thus making them beggars."

A universal basic income (UBI) is being explored in

Kenya, Canada, Finland, Scotland and the Netherlands. The idea of providing those without work a basic financial payment is not a new concept. Over the centuries, individuals such as Thomas More, Thomas Paine, Bertrand Russell and Martin Luther King Jr. pondered the matter. Presently a program called Give Directly, which is funded by wealthy Silicon Valley entrepreneurs, is providing impoverished places in rural Kenya with direct payments to the local citizenry. In February, New York Times Magazine writer Annie Lowrey asks: "Is Silicon Valley about to put the world out of work? And if so, do technologists owe the world a solution?" With the abysmal administration currently in power in Washington, D.C., a conversation about a basic income for all Americans is not going to happen.

Dormehl packs a lot into his book. He explores some of the more extraordinary issues hovering about AI, like the quasi-religious concept of "singularity," in which intelligent machines surpass human beings, making for a new era that may or may not include humanity. This volume is a serious look at an important topic.

"Whichever way you slice it," writes Dormehl, "work as we know it is about to change."

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