Ethics in Technology

How Do We Future Proof Society from the Unintended Consequences of Progress?

By Paul Conn

Humans have always marveled at technological advances, whether it's putting men in the sky or on the moon. We hail each achievement as a progressive step forward into a future of leisure, excitement and unlimited potential. One of the most visited exhibits at the 1964 World's Fair depicted a peak into the future with a visual look at what our homes, cities, and life might look like in the decades to come. Helpful robots, self-driving cars, jet packs, video calls, and automated homes were some of the predictions that are now a reality (Gittleson bbc.com). The exponential growth of technology brings up a range of ethical problems that we currently don't have good solutions for. My goal is to educate the reader on some of the trending ethical dilemmas surrounding technology – specifically artificial intelligence, robotics, and automation – then propose my own solutions to these questions.

To achieve this goal, I have organized my paper around three ethical dilemmas: massive unemployment due to technological advances, machines programmed to kill, and making algorithms transparent and unbiased. Before I begin discussing these questions, I need to provide an overview of the topics being discussed.

Topic Overview

This paper talks about artificial intelligence (AI), algorithms, robotics, and automation. AI has several definitions and subsets but for this paper I am referring to AI as a machine or algorithmic-based program that can perform "cognitive" functions like

that of a human, such as learning, problem solving, natural language processing, vision, and speech recognition. Think Siri or Alexa as examples. The vacuuming Roomba is an example of a robot widely used today. Automation involves taking a task or job that requires a human and taking them out of the equation by allowing a machine or AI program to perform the task without any intervention. Manufacturing has gradually increased their use of automation over the decades, which is why productivity has increased but the number of workers required has steadily decreased.

Ethical Questions

Large Segment of Population Unemployable Due to Cognitive AI

One of the first ethical issues that we will discuss involves the rise of automation and robotics in the workplace. Does a society have an obligation to provide job opportunities so that a person can provide for their family? Not guarantee a job, but the opportunity to find a job. How perilous could the job market be in the future? A 2013 Oxford study estimated that "47% of total US employment is in the high risk category" of being automated within the next decade or two. These job losses do not occur in just blue collar jobs like manufacturing and retail. Automation touches nearly every sector and job title in corporate America. This includes executives, lawyers, managers, accountants, financial consultants, stock brokers, and even computer programmers (Chace Sec 3.2).

Many politicians and activists call for reform of our education system. Others want training programs available for displaced workers. Neither of these ideas help humans compete for jobs against AI or AI-enhanced robots. The beauty of an AI attached to a robot or autonomous vehicle is its ability to apply what Elon Musk calls *Fleet Learning*. Teslas track and report everything that happens while driving. It reports this information back so that the AI can be improved. So, millions of cars are constantly improving the knowledge base and these improvements then can be applied to the entire fleet at once. Humans cannot compete with this type of 'education'. This makes humans in those markets affected by AI unemployable forever. If nearly half of America was not just out of work but unemployable, how does government and society handle this? Should governments increase the safety net to account for this societal reality (Scott Ch 9) ?

What you may find surprising is that this debate has been going on since the 1800s. In his 1867 book *Capital*, Karl Marx predicted that "increasing automation of production would eventually eliminate the worker altogether" (Rifkin 16). In 1925, the Senate held hearings to discuss the increasing number of workers being displaced by productivity gains in the 1920s. The committee found that most of these workers who lost their jobs because of these gains remained unemployed for a very long time (18). A 1964 report dubbed the 'Triple Revolution' discussed revolutionary forces that would affect the nation now and in the future. The first revolution was nuclear weapons, the second

was the civil rights movement, and the third was "cybernation" or automation. Although automation had not yet made the gains it has today, it was a big enough future threat that the committee devoted the bulk of its report to it. This committee "went on to propose a radical solution for this problem: the eventual implementation of a guaranteed minimum income made possible by the economy of abundance such widespread automation could create…and would take the place of…welfare measures" (Ford 30).

I suggest that governments study this issue and develop a long-term plan quickly. Even if estimates are high and only 30% of the population become unemployable, that's still anywhere from 30-40 million Americans based on the current workforce. A number this great may destabilize society and would have secondary effects of reducing tax money needed to pay Social Security, Medicare, and many other social programs. In the short term, I would advocate for a reorganization of our education philosophy to demand more emphasis on learning how to work with machines, develop critical thinking skills, and less on rote memory. In the long term, the government will have to implement some radical wealth redistribution programs to deal with joblessness. More importantly, they will need to find some type of 'work' for people to help them get some sense of fulfillment in their lives and restrain potential civil unrest. This could be programs like the work programs enacted during the Great Depression or community-based programs that help the elderly or disadvantaged among us. With more time on our hands, perhaps

you encourage community gardening, art programs, or developing a trade like carpentry or building things.

Creating Machines That Kill or Destroy

The third ethical dilemma is perhaps one of the most important. Should we allow machines to be programmed to kill? If they can be programmed to kill, who should they kill? Could this programming be hacked to alter who they can kill? Right now, drones are used in hot spots around the world to find and destroy 'bad guys' such as terrorists. Robots are being built and tested that can carry heavy supplies or drag injured soldiers from the battlefield. How long before the military decides to give these robots a weapon?

Should robots be built that can harm humans? In the 1940s, renowned science fiction writer Isaac Asimov came up with the "Three Laws of Robotics" to attempt to build some code of ethics into his fictional robots. The first law states, "a robot may not injure a human being or, through inaction, allow a human to come to harm." The second states, "a robot must obey orders given it by humans except where such orders conflict with the First Law." The last law states, "a robot must protect its own existence as long as protection does not conflict with the First or Second Law." Of course, these are theoretical laws written for fiction but it gives you an idea of the need to have some parameters around robots to ensure they are not a threat to man. It would also be nearly impossible to hardwire 'laws' into a machine so you would need software to do this. And

as we all know, software is known for being vulnerable to hacking or exploits (Scott Ch 9).

Currently our drones are being controlled by a human on the other end but work is underway to sever the human connection and allow drones to fly autonomous missions without a human in direct control (Bostrom, *Superintelligence* 14,15). In order to give these drones the freedom to do this, the military is working with researchers to try to build ethics into their machines. They first want "to pin down exactly what human morality is, and then try to devise computer algorithms that will imbue autonomous robots with moral competence – the ability to choose right from wrong." (Anthony www.extremetech.com).

It will be interesting to see what they 'pin down' as human morality since even today's society has trouble defining morality for mankind. If robots had been built in the 1800s slavery would have been programmed as ethical. Societal ethics changes with the current historical place we are in. I fear that man is on a path of 'life imitating art' with military robots. If we allow the military to create these death robots, the desire for diplomacy may be diminished since we're not worried about losing actual lives on these future battlefields. Hackers or digital evolution could one day turn those robotic war machines against their creators.

I believe that the military should commit to using robots only in support roles with no capability to take a life. Instead they should be used to save lives. They can disengage bombs and IEDs, go into dangerous areas to deliver food and medical supplies to civilians, extract injured soldiers from the battlefield, provide translation, and even help us communicate with the enemy.

Making Algorithms That Are Transparent and Non-Biased

Algorithms are the 'recipes' used to create AI's. However, these algorithms are only as good as the data they are fed. Data-fed algorithms are used to determine credit worthiness, police force allocation, and even sentencing guidelines. These algorithms are replacing humans to remove bias. The results show that biased data leads to biased results. Google's photo app appeared to turn racist when it began "classifying pictures of black people as gorillas." Predictive policing algorithms directed police to pre-emptively target black neighborhoods. The problem here is not biased programmers but the data itself. Garbage in, garbage out as they say in the programming world (Scott 443). The only way around this bias in data is through transparency and monitoring. AI's need to be built in a way that allows them to be inspected for bias and predictability (Bostrom and Yudkowsky, "Ethics of A.I." 2,3).

I suggest that we build AI's with built-in ethics or alternate AI's that can be used to check other systems for bias and make code recommendations to rectify the problems

they find. Some computer scientists are already working to tackle these problems. A group of tech industry titans announced that they were setting aside funding "to teach morals, ethics and perhaps even a little religion to artificial intelligence." They will look at how to put controls in place to minimize its potential dangers to society while still maximizing its benefits (Seaburn www.mysteriousuniverse.org). We will need many more ideas like this to ensure that human bias doesn't become part of this 'perfect' system we are trying to create.

To sum up, there are many ethical questions surrounding the rapidly increasing power of automation, robotics and artificial intelligence to impact humanity. Governments, researchers, and businesses need to start planning now. If we wait until these technologies get to the point where they are causing major societal problems, it is too late. These systems are being built right now and there are no overarching ethic guidelines informing how they should be built and what strategies we should be implementing to supervise them. Man must take control of our creation before the creation takes control of us.

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