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The Possibility of Enhancement or Destruction

In today’s society there is a dependence (especially on the younger generation) on technology being readily available to assist with day-to-day activities. However, is technology only limited to what we have now? Is there potential to expand a machines capability more? The answers in order is as follows: no and yes. Technology has an almost limitless boundary that can be expanded upon based on the imaginations of the scientist and engineers whom create them. The only problem is no one knows for certain what affect this advancement will have on humanity. Artificial Intelligence has only recently developed after World War II and since then has been making great leaps in progress thus leaving everything but speculation of what the future could possibly look like. For example, in the past there has been books such as *Brave New World* published describing a dystopia where individuals lose their humanity due to the advancement of technology and the changes that came to society with it. However, on the other end of the spectrum there were also hopeful depictions of the future spread through various medias such as television with the show the *Jetsons.* This debate is still a very hot topic especially with the growth of robotics. However, it really comes down to the misperceptions of the general public of the types of robotics that are currently being developed, economic influences, skeptics against idealists, and what is currently available. Overall, artificial intelligence has created a very unique issue in this generation.

For this generation, technology has been ingrained in the culture and it shows in many ways. However, when did technology truly start becoming so prevalent in the world’s culture? There is no easy answer for this question, however, if one looks at when it developed the most it would be said that one of the biggest pushes was during World War II and the time after that during the Cold War (especially in the United States of America), “For at least the last half century, important measures of computing, such as processing speed, transistor density, and memory, have been doubling approximately every eighteen to twenty-four months, which is an exponential place (power 2)” (Kaplan 26). This can be shown with how computers (a form of artificial intelligence) has changed. In the past, computers used to take up entire rooms, took up significant energy to run and process, were extremely expensive, and were strictly limited to government use since they were so hard to obtain and maintain. While today, computers can be sold relatively cheaply with even more power than their predecessors and be able to deliver results in record time. This is an incredible feat due to the fact that, “Processing power and memory. . . In 1980, for all practical purposes, the concept barely existed. . . Today, literally billions of devices are able to share data nearly instantly, as you demonstrate every time you make a phone call or send a text message” (Kaplan 28). However, it is not only computers that evolved, machines in factories (which would become some of the basics of the first robots) did eventually give way to robots whom worked on a conveyer belt, but required special precautions lest something unfortunate should occur, “Early robots. . . if you got in their way, you were in serious danger of getting whacked, or worse. . . In factories and research labs, including the one at MIT, the standard practice was to place brightly colored tape on the floor around a robot, indicating a “kill zone” inside of which you were forbidden to venture without special precautions” (Kaplan 37). Since then, robots have become a normal occurrence in factories and accidents have lowered dramatically since their first introduction while becoming more efficient. Indeed, technology has come a long way from the beginning of World War II, but how far do people think technology will evolve and what could this possibly mean for the current generation?

One of the main concerns is how technology will effect the economy in the future due to the possibility of robots replacing people in many different fields of work. For example, today’s economy cannot sustain this transformation for a couple of reasons. First, in America’s economy there is an unequal distribution of wealth with the top one percent being extremely wealthy and a large populace being lower middle class or in a state of poverty due to the way that the economy is set up, and with the wealth that should robotics become more advanced and jobs dissipate with no replacement it could lead to a rather depressing picture, “The two great scourges of the modern developed world – persistent unemployment and increasing income inequality. . . unchecked, we may witness the spectacle of widespread poverty against a backdrop of escalating comfort and wealth” (Kaplan 3). In fact, such a development can be seen today due to more recent advancements in the field of robotics where computers are now able to do certain activities better than a human can, “Recent advances in robotics, perception, and machine learning, propelled, by accelerating improvements in computer technology, are enabling a new generation of systems that rival or exceed human capabilities” (Kaplan 3). This leads to jobs that used to require humans to be slowly replaced by more capable machines, “I.B.M. is already doing itself one better with I.B.M. Watson Engagement Advisor, software designed to answer technical-support questions with greater accuracy than humans” (Bowman). Unless, the governments of the world change the way their economic system runs and distribute wealth more equivalently the future for many people seems quite dim.

Another concern is will the future artificial intelligence is if one day they will exceed the power of the human brain and will no longer require humans to maintain themselves. In the scientific community, there are multiple answers ranging from robotics having no need for human assistance due to their superior capabilities and growing “intellect” to the full potential of the brain is yet unknown and therefore one cannot hope for a machine to match its power. This is based on the idea that machines will be able to replicate the human brain, “But the scientific threshold (computers actually *duplicating* human intelligence) is probably much further away” (Andersen). This is due to the fact that there are constant discoveries about the brain, “In fact, the neuroscience breakthroughs of the past 20 years are revealing how much we *don’t* understand, vastly expanding the scale and scope of the known unknowns” (Andersen). However, that is not to say that the potential power of a machine could progress to the point that it does seem to have the capabilities of the brain, “It’s quite possible, if not likely, that within a decade or two your smartphone may in principle have as much processing power as your brain. It’s hard to even imagine today what we will do with all this power, and it’s quite possibly just around the corner” (Kaplan 27). Therefore, despite there being a wide range of opinions on this matter, logically speaking there is not very much known about the brain and to claim that machines will be able to inherit this type of ambiguity is highly unlikely.

There is another layer when it comes to artificial intelligence and that is the public misconception on artificial intelligence. There are two types of intelligence when it comes to robotics: artificial intelligence and synthetic intelligence, “The most important difference between the symbolic systems and neural networking approaches to AI is that the former requires the programmer to predefine the symbols and logical rules that constitute the domain of discourse for the problem, while the latter simply requires the programmer to present sufficient examples” (Kaplan 24). Artificial intelligence is the type of robotics that people interact with every day. Many believe that artificial intelligence is what they see in dystopian movies where the robots take over the world, however, this is not the case, “These machines aren’t conscious, self-reflective, and don’t exhibit any hint of independent aspirations or personal desires. . . they don’t have minds” (Kaplan 4). Some examples of artificial intelligence would be the projector used in the classroom, the iphones that many students on campus seem to have attached to their hands, and the computer that this paper was written in. In an individual’s everyday life they are constantly and unwittingly surrounded by artificial intelligence which they have become accustomed to. Improvements in this type of robotics will allow for new devices to be developed in order to help humans create a safer environment such as having an automatic emergency brake sensor in cars to try and help prevent accidents. Synthetic intelligence, however, is something else entirely. These machines have a lot more capabilities than artificial intelligence due to how they are designed, “The second class of new systems arises from the marriage of sensor and actuators. They can see, hear, feel, and interact with their surroundings” (Kaplan 5). For example they will be able to analyze their surroundings and cause less accidents because unlike the previous machines whom could not sense their surroundings and had to have a “kill zone” for safety purposes. These machines are unique in that instead of a person programming the machine with the exact method on how the machine will approach to solving a problem; rather they will give examples of what they want solved and the machine will come to its own conclusion to the problem. The limit for their perception is unknown, “They will soon know more about you than your mother does, be able to predict your behavior better than you can, and warn you of dangers you cant even perceive” (Kaplan 5) and while it leaves an entire frontier for exploration many are uncomfortable with the idea that these machines will analyze them. While this idea can be a bit unnerving synthetic intelligence does provide some incredible possibilities. For example, one of the professions that synthetic intelligence is the medical field and with these machines it is quite possible that new practices will be discovered due to a new perspective and method being introduced. Indeed, these two types of robotics are very different and are usually mistaken for each other and create misperceptions in today’s society.

In fact, these perceptions have created two groups who are polar opposites. These groups are called the Singularitarians and the Skeptics. These groups formed around the end of the twentieth century when there was a push on advancing robotic capabilities. In fact, there are universities in England (Oxford and Cambridge) specifically teaching what to do in case of a crisis involving machines; while in the United States there are universities (Singularity University) that are dedicated to further advancing the capabilities of machines (Andersen). These specific programs are then used as a way to make connections to organizations where the different type of robotics are being developed either to push the boundaries or focus on slowly progressing technology while keeping it controlled. The Singularitarians are the side that is very optimistic about the future of synthetic intelligence. For example, there is a synthetic machine that has passed the self awareness test and while the Skeptics questioned if the robot could actually sense what is around them the “Singularitarians would take any apparently sentient machine at its word” (Andersen). They believe that synthetic intelligence “will shortly provide plenty of clean water, food, and energy for all earthlings, as well as decent educations and adequate health care.” (Andersen) and they have a reason for this due to the fact that there has been such significant developments in technology, “The Singularitarians’ fundamental tenet is that Moore’s Law—the doubling of digital technology’s bang-for-the-buck every year or two for the last half-century as microchips have gotten faster, cheaper, and more powerful—is no temporary thing: that the exponential increase in inexpensive computer power is bound to keep spiraling upward and onward” (Andersen). The Skeptics are one the other side of the spectrum. Skeptics generally believe that “We are in danger of becoming road kill on the so-called information superhighway” (Kaplan 42). Needless to say, this is a very negative outlook on the development of synthetic intelligence. This is due not only to the fact that not much is known about the capabilities of synthetic intelligence, but also due to the fact that they acknowledge that there is an economic aspect, “They need a large dose of caution, to understand and admit that if we’re entering an unprecedented new technological era we also need to create an unprecedented new political economy to cope. On the way to robots and computers taking more and more of our jobs, we can’t just write off the people whose livelihoods are eliminated as losers and moochers, or take it on faith that enough new human jobs will be created” (Andersen). Indeed, this is something to consider especially with today’s society where the wealth is atrociously dispersed. However, another aspect to their disapproval to synthetic intelligence is the fear that one day machines will no longer require humans to operate them, “His book, based on interviews with scores of AI developers and philosophers, warns that AI machines—now programmed to play chess and prescribe treatment for cancer patients—could eventually far outperform the human brain, and thus, no longer rely on mankind to operate” (Bowman). This fear is coupled with the fact that psychologically speaking humans tend to treat things that look similar to them more like an individual, “The tendency to think of AI systems in general and robots in particular as analogs of human brains and brawn is understandable, but it carries significant dangers. . . It also misleads people into believing that machines are more like us than they really are, and into assuming that they are capable of understanding and abiding by our social conventions” (Kaplan 36). While both sides have their own beliefs and legitimate points but they are both extremes. There seems to be no mediator in the scientific community.

Despite their extremities technology will advance whether they wish it to or not. This technology will ranges from agriculture, espionage, and everyday living in the future. For example, “Machines of the future could help create an abundance of resources in parts of the world where they are in short supply, producing crops and operating on patients in third-world countries, among other endeavors” (Bowman) this will lead to a time of prosperity if it is programed and developed properly. In the future, it is also speculated that technology will be able to further assist in investigations, “Turing wrote, “that in about 50 years’ time it will be possible to programme computers . . . to make them play the imitation game so well that an average interrogator will not have more than 70 percent chance of making the right identification after five minutes of questioning” (Andersen). However, this technology is not limited to only the future. Society already has quite a few feats of artificial and synthetic intelligence. For example, there is now technology that allows for machine parts to repair itself it is actually being implemented in aircraft wings since they have a tendency to go into disrepair, “Today’s preprogrammed, repetitive mechanical devices are primitive precursors to robots that can see, hear, plan, and adapt their behavior to chaotic and complex real-world situations. These are robots that will be able to accomplish many, if not most, tasks that currently require human manual labor.” (Kaplan 39). Humans in first world countries no longer need to leave their house to shop because websites such as Amazon and Google, “Amazon replaces everything from bookstores to shoe stores by combining the common functions into one unified system. Google replaces libraries, newspapers, and business directories under a single organizing umbrella” (Kaplan 48). There is also some synthetic intelligence that help humans improve in athletics, “Upon returning to the Stranford AI Lab, to find a graduate student having a mock swordfight with a robot. Not only did the mechanical fencer track its opponent’s moves and plan its own motions, it could stop just short of potentially lethal actions” (Kaplan 38). Therefore, no matter how one looks at it, society is imbedded into technology.

Upon reflection, it is truly remarkable to see how far technology has progressed and how it is also currently being enhanced, and to observe the two very different stances on this issue all the while new achievements in robotics are being achieved. Indeed, there are many things to consider when approaching this topic and how it will affect the future, and it will affect the future that much is certain, when no one truly knows what will come of it. Probably, the best outlook to take is a mixture of the Singularitarians and the Skeptics achieving a hopeful outlook on what is to come, but proceeding with caution. This will leave the future generations an open canvas while taking consideration of their economic state (for if the economic system is not adjusted it could prove to be disastrous) and the people it will affect. Technology is an opportunity to help humanity reach their full potential if approached correctly and can be truly a marvelous thing.

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