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*I pledge my honor that I have abided by the Stevens Honor System.*

Handling an Unavoidable Future

Throughout the history of industry, productivity has been king. Henry Ford’s assembly line model for factories swept the older, slower artisans out of their craft. Consumers got cheaper, polished, mass-produced products, of which manufacturers had more to sell. Any technology that can be used to increase quality and output has been a positive thing in the eyes of companies. As of the past few decades, the newest means of increasing productivity have been computers, and, most recently, robots. These robots are typically created with the express purpose of performing a single, simple task. For example, they may take a bottle off of a belt, wrap a label around it, and then place it back on that belt. The machines are very efficient at what they do, can operate any hour of the day, and do not need to be paid. As robots continue to advance and begin to take jobs from people, the question of what to do with all of the incoming displaced workers has been a touchy subject. Additional education and training will be needed to ensure that workers unable to get a job done by a machine are able to be useful in the workplace, at least by monitoring or maintenancing said machines.

When the assembly line was introduced, the newly created factories had the added bonus of creating low level jobs requiring simple manual labor. Robots, on the other hand, replace workers entirely. This is simple economics: from a company’s standpoint, robots are cheaper and more efficient. As robots get more advanced they will be able to displace more and more factory jobs; tons of people will be left unemployed. The benefactors of this transformation will be the scientists and engineers creating the robots, and businesses themselves. This bounty, described by McAfee and Brynjolfsson, will go to the rich, causing the spread between the rich and poor to grow ever larger. Avoiding the escalation of this situation is on many people’s minds, but there seems to be no simple solution in sight. Historically, companies will adopt technologies that reduce expenses, and robots will only get better and better at doing just that. There are many short sighted solutions to this problem: pass legislation to force companies to employ some arbitrary percentage of human workers, guarantee current factory workers some sort of compensation if they get displaced, investing in greater unemployment benefits, or even ban robots from taking certain jobs. None of these solutions sounds wise; they would make lawmakers sound like luddites, stunting economic progress. Of those solutions, investing in unemployment benefits seems to be the most fair; with the economy being stimulated by ever cheaper products, the rich should be able to afford to add to the current unemployment system. Of course people will fight back against this, claiming the unemployment system promotes laziness. There is no one good answer to that, but unemployment benefits are clearly better than having families live on the street once robots have replaced their jobs. Unfortunately, it seems simple and broad legislation is not enough to stifle the root of this pressing issue.

Seeing how scientists, engineers, and businessmen will be on the successful side of the future, some might suggest we try to educate everyone, and make them all capable of making, programming, or managing the robots that will replace them. The logic seems sound, if everyone was smart enough to contribute to a company in a meaningful way, they would not be replaced, and there would be more advanced technology in greater quantities. This, however, is entirely infeasible for multiple reasons. Upper education is simply too expensive for many people, especially for people who have kids and those who already have a job without a degree. As of 2012, approximately 40% of working age Americans had some form of college education. In many fields involving college diplomas there is already intense competition; this competition would only become more severe with the addition of yet more college graduates, which would have the similar net unemployment. Simply put, attempting broader upper education would be a prohibitively expensive venture that most likely would not solve the pending problem.

With all of these defunct simple solutions, one may be hard pressed to find a way to handle the inevitable ramifications of the bounty and spread. These changes are bound to come, sooner or later. Hundreds of thousands of people will find themselves outraged because they lost their job to a hunk of metal powered by silicon and electricity. Instead of fighting this change, the best way to handle its consequences is to embrace it. When the machines come and take lower level, menial jobs, society has to take a look at what is left. Cleaning and food services are professions that are less likely to be overtaken by robots anytime soon, though they will fill up relatively quickly; there can only be so many janitors, waiters, and chefs. For everyone else, there exists a potential two part solution. A small law should be passed: no factory in the USA should be completely autonomous; factories should require some human component to them. For the most part, this would mean people would be employed to maintenance and repair the robots operating the facility. Training programs for employees to learn how to repair, replace, and manage specific machines would be beneficial for companies and for the general population; more jobs could coexist with robots, and companies would be able to keep the robots running at maximum efficiency.

A new worry is introduced in the form of McAfee and Brynjolfsson’s hypothetical android, a machine capable of anything and everything a human can do. Once these machines are cheap to manufacture and mass produce, there is little to stop them from taking over the entire workforce; they will be able to run for much longer times, require less maintenance, and work for free. The same proposed solution for the current crisis is completely moot if humans are not even required to maintain or fix the robots. Once the most human of tasks is automated, humans will simply have no place in the workforce. Some might argue that that sounds like utopia, others argue it will never happen. Regardless, there is no solution to that problem; if people can get machines to do work for them, they almost invariably will. Only time will tell where humanity lies after that scenario becomes reality. Until then, coexisting and working alongside robots, as mentioned by McAfee and Brynjolfsson, should be the workforce’s top priority.

Robotics, artificial intelligence, and computer science will end up displacing a large number of menial, low level jobs over the next few decades. Not everyone in those jobs will make it out of this revolution unscathed. Those people will need to adapt, and embrace the new hand they have been dealt. Making sure employers do not completely automate their workplaces and training workers to come in and assist, maintain, repair, and replace the robots will help stave off some of the worst of the impending unemployment crises. The other solution for any individual is to join the winning side before the crisis even starts; it is for this reason that my argument is fundamentally biased. As a computer science student attending an institute of technology, I am all for computers and robots taking over lower level jobs; the jobs and market created by those robots are all beneficial to me and to my fellow scientists and engineers. In my current frame of mind, I do not see a way out of this future; being surrounded by increasingly amazing advancements in technology, it’s hard to see a future where robots are not doing many of the jobs they are capable of, and even harder to find a way to ensure people who aren’t well trained still have a way to put food on the table. Even worse, I can’t suggest more people get science and engineering degrees when I see people all around me struggling with them already. I hope my suggestions may be employed in some capacity in the coming years and may help with the coming struggle, but I know that there will be plenty of strife in the years to come. While I hope people find ways to succeed in the coming years, I understand it feels like an empty sentiment coming from someone who will be partly responsible for causing the foreseen problems.