# A New Era of Automation

by Duygu Bayram

Nowadays, there are plenty of doomsday predictions to go around. These can range from nuclear wars to asteroids. The fast development of artificial intelligence is a commonly discussed worry among these predictions even by professionals. However, there are some general misconceptions surrounding AI, and so, it is best to address these misconceptions before we share what the aforementioned professionals think about what AI means for the future.

Despite what the movies might have you believe, the worry about AI is not that it will develop a God Complex and take over the world, but that we might not be able to predict the consequences of its lack of human element. AI research has the goal of getting machines to replicate certain things the human brain can do, such as perception, learning, and decision making. While the field has shown remarkable development, these behaviors are mimicked through the use of mathematics. If you are interested, you can look into linear algebra and multivariable calculus to get a sense of how most of these models are built, for example, by using vectors for face recognition. As it stands, we can still only rebuild the functions of the brain to the extent we can understand them mathematically, which is not necessarily a whole lot to go by, or by finding mathematical ways to perform the same action, but not in the way the human brain does it. Do not get me wrong, math can be pretty powerful, but AI still falls short in many ways, which can be illustrated best with its handling of language. Language is one of the uniquely human features and it has many functions that cannot *easily* be mimicked through mathematics. For example, we may say, “It is too hot in here.” to imply that we want someone to open the window, and while that example is an easy obstacle to tackle, there are many more such cases with more complexity that makes language difficult to program. That is not to say it is impossible, it is just a good example to make my point clear that there is a certain narrowness to an AI’s comprehension abilities.

The limits of AI bring us to what people are actually worried about: the uncertainty around predicting how it may interpret certain problems, and what solutions it may come up with. To illustrate, say you need to get somewhere as fast as you can, you say that to a human driver and they will take shortcuts, or drive as fast as they can within safe limits and traffic rules as they share the human common sense. On the other hand, imagine saying that to a self-driving car, it may push through traffic, drive over the speed limit, not even considering your wellbeing. Of course, current technology is not that badly programmed but the point here is that artificial intelligence relies on its human builders to think of potential problems that may arise from non-human thinking and prepare for them. Make the task more complex, and predicting the potential misinterpretations might easily get out of hand.

Another aspect of AI development that rings alarm bells is the type of automation it has been introducing to the picture, which is what we will focus on in this article. Automation is not a new concept, we have been inventing certain tools to make our jobs easier for a long time now, it is what drives human innovation. Certain jobs came and went with new technologies, there are jobs you probably have not come across in your lifetime if you are a young reader, to give a few examples; railroad workers, elevator attendance, and phone operators. Currently, you can easily observe this job

loss in fast-food restaurants and customs at airports where you are now able to get your service on a machine without the need of a person. However, despite the death of jobs over the course of human history, we all still work. How does this happen? And if so, should we really be worried about 21st-century automation?

When there is a new invention, it often causes a slight shift in the economic system, it takes over many jobs, while also creating new industries, directly or indirectly leading to a rise of new jobs. When we are living in an era where automation is happening, we are usually able to predict which jobs will be replaced, but we cannot see the new industries the new technology could potentially create. Our reports also tend to focus on the potential job loss we will experience from automation, but not what type of new jobs it might create. When we look at the past, we see that new technologies create new jobs aimed at designing and maintaining these technologies. Furthermore, they allow companies to swap their human workforce with machines, which results in more cost-effective production. The money these businesses are able to spare then allows them to expand, creating new jobs in new areas. It also allows them to lower their prices, and their customers to have more money to spend on other things, which in turn may create new industries in different fields. This system illustrates how our standards of living have been improving, we leave certain work to machines, so we can start working on other things.

There are, however, many arguments on the opposing end suggesting that automation may not be the same in our era. To start with, the creation of new jobs does not mean that the people changing industries will be paid the same. Perhaps the biggest distinction of 21st-century automation is how much of that newly acquired wealth is returned into the system, or rather, how much it is not. For example, the invention of cars led to many different industries and job opportunities, from new drivers to people that were involved in changing city infrastructures to build roads, to gas companies, and so on. Google, what could be its modern counterpart, does not nearly have the impact cars had. To provide a more clear comparison, the internet is often spoken of as a contender to the invention of electricity, and in many areas maybe it is, but while electricity resulted in a significant increase in job opportunities, the internet did not do that. Of course, it has created new industries like online shopping, but it is not creating enough to compensate for the loss it causes. You can also see this difference by comparing TV news channels to online news outlets, or by comparing movie theatres to Netflix. While Blockbuster had 84000 employees and earned 6 billion dollars in 2004, Netflix gained about 9 billion dollars in 2016 with just about 4000 employees. In short, job creation in the modern era is slower, whereas automation is much faster.

Automation in the past has replaced routine, narrow tasks while leading people to specialize in more complex work. Our specialization moved from agriculture to production after the industrial revolution, and to the service industry after machine automation. In the information age, our machines are now trying to *learn* to specialize. For the last two or so decades, large amounts of data on everything we do as humans has been collected. Artificial intelligence means that the programs are now able to analyze this data to do our job even better than us in a lot of cases. Now, AI can analyze your buying habits and get you to spend more money a lot better than a person in marketing can. This means that now, to put it in a little more dramatic way, the machines may not be replacing our tasks, but replacing us. There may not be many fields left for us to specialize in that AI cannot.

Another argument worth pointing out is that it was assumed in the past that automation would increase productivity and efficiency, that is, more amount of work done in less time. However, productivity growth has been slowing down since the early 2000s, and that does not benefit us necessarily. 2000-2010 was the first decade in US history where the total sum of jobs did not grow. This poses a huge problem as it cannot even account for population growth. Furthermore, despite the 42% productivity growth in the US since 1998, the working hours did not decrease, thus not resulting in a higher standard of living for people. Not only that, recent graduates in the US have lower wages and are often forced to accept jobs they are overqualified for. The new wealth generated from the new technologies of the 21st century seems to be staying at the top, and not being circulated, because companies like Google can earn a lot more money with a lot less human workforce that they have to pay for. When our economy is so heavily based on the interaction between production and consumption, who will be consuming all of this increased output if the majority of the population cannot afford it anymore? The pandemic of 2020 has made this issue even more worrying, as many people have lost their jobs and it is possible that those vacancies will be swiftly replaced with technology when the quarantine is over.

On the other hand, this new type of automation and lack of job creation could mean a different era of humanity. If people were provided with a Universal Basic Income, and we could automate more jobs, it could be possible to create a society where we no longer have to work to survive. Of course, this is just speculation, but it could be worth considering. (1) (2) (3) (4) (5) (6) (7) (8) (9) (10)