Blogpost Ellinor Bolt, Melbourne, 2019

Artificial intelligence

A reflective blogpost discussing information, ideas and historical perspectives on the topic of artificial intelligence based on futurist thinkers and scientists research and progress today.

The possibilities and dangers with artificial intelligence

Introduction

Artificial intelligence gives us advantages we have never had before; in a way today we have become cyborgs with our phones and computers extending our minds through the internet. We can store and access large quantities of information using devices with artificial intelligence. Robots programmed to do hazardous, repetitive and mundane work are taking over many jobs. We can also improve our medicine with artificial intelligence and our healthcare system. What would happen if difficulties occurred with our technology that we put so much faith in?

What is AI?

Artificial intelligence exists all around us, the learning machines we have built are continuing to build our system autonomously in a way. Our technology has progressed fast, and if we would have built a modern iPhone back in 1957 it would have cost a fortune and it would have been enormous. The iPhone would have used 30 times the worlds maximum power generating capacity. Learning systems need as much data as possible in order to learn. As our technology advances and more storage and bandwidth becomes cheaper and more accessible, we agree to more conditions and we let different artificial intelligence learn more about us.[Bostrom,2014,18]

The line between software and AI, artificial intelligence, is vague and can be defined in different ways. Google is one of our biggest AI platforms. [Bostrom,2014,16] With around 40 000 searches every second, and many of them being processed with AI, google collects big amounts of search information. Stock market and bank transaction data get analysed by machines as well. [Chance,2018,18] We can access information within seconds; this gives us advantages when making decisions and remembering information. The data collected is used for multiple purposes, to make us find the information we are searching for faster, and not only shaping what we see on the internet, also what we see in stores in the physical world. [Chance,2018,19] Artificial intelligence started off being coded to identify symbols, if something was slightly different with the symbol the computer had learned to recognize, the AI failed to identify it and crashed. The programmer showed the computer an image, and the computer could only recognize the image from that specific angle or with that specific character. To show the computer all the different kinds of images there would possibly be of the object it was supposed to recognize, would be incredibly time-consuming. One of the newer techniques including neural networks and genetic algorithms have an organic problem-solving method and it does not immediately crash when it cannot recognize the task.[Bostrom,2014,18] Learning machines teach themselves through their environment and become autonomous, they show themselves a large amount of images to recognize the object or task in various ways. Time-consuming tasks we did in the past can be done with these automations and we can reach results and data in many fields in a speed unimaginable. There are different levels of AI and the most advanced level is called ''superintelligence''. The invention of superintelligence is for Boström(2014), the Swedish futurist and philosopher at Oxford university the start of a new paradigm. [Bostrom,2014,128] If we could manage to create a

simulation of a brain, through neural computing, we could not only create the capacity of the brain. We could also make it speed it up and copy itself. The new artificial brain would not have a body to maintain or be distracted by so it could focus on problem-solving exclusively, and focus on advancing and copying itself to become an even more intelligent brain. It could hypothetically copy itself and develop into a superior unimaginable intelligence. Many are speculating about these ideas; how fast could this escalate and where could it end up? Today we would need improved technology to invent a computer with the capacity of a human brain, it might be possible in a few years if we keep progressing in this speed. [Shanahan,2015,80-100] Our neural computers are built with neuron mimicking silicon chips, they do not have consciousness but if there were to be very large quantity of these, we would not know what would happen, says Chang founder of an Australian AI company in Melbourne called Silverpond in a recently made survey.[Silverpond,2019,18]

AI in our workplace

We predict many jobs today will be replaced by intelligent machines, such as repetitive work tasks, hazardous work or work that does not include emotional interaction. [Bostrom,2014,160-161] To not put human workers at risk is a progress in the right direction. [Chance,2018,19] The jobs within programming AI and maintaining our robotics would most likely replace some of the repetitive routine work. [Forbes,2018] This is a bit problematic, according to the

Melbourne company Silverponds statistics in the graph above from their survey, we would need to encourage a more diverse group of people to get involved in learning programming. There are very few women in the field in Australia.
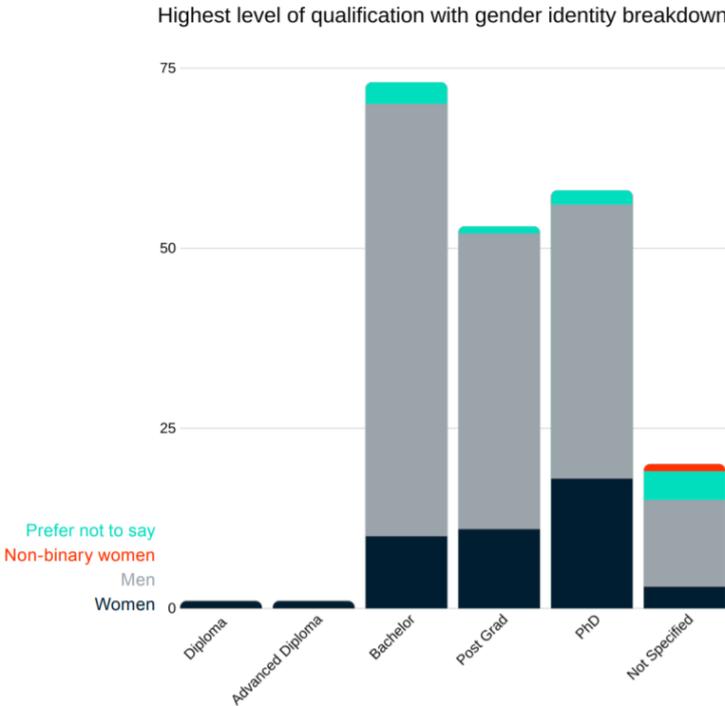
In Finland they have started free online university platforms, where you can learn programming. We can see many are following this concept including Australia.

This might reduce segregation and allow people to engage in education for free in a field where there are jobs. A diverse mindset and a diverse talent in a team is a strength.[(Silverpond,2019,6)] In the graph to the right from Silverponds survey we can see how online courses and tutorials are leading when it comes to learning programming. At second place is coding with a group, outside of formal university here in Australia.[(Silverpond,2019,7)]

Where do you go to develop your AI Skills?
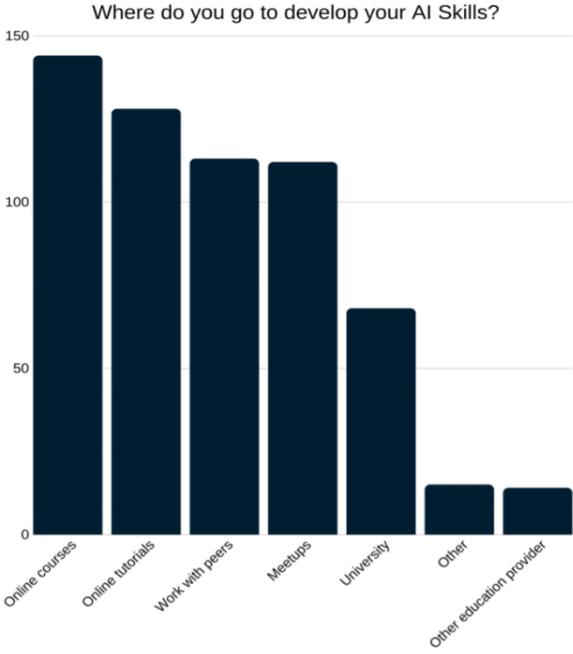
Australia's AI Ecosystem - 07

What would the future look like if AI took over a lot of today's work? With a future without repetitive mundane work we might have more free time, time we could use to focus on developing ourselves and society in innovative way. Meaning, today our standard of living is very high, and if machine automation could do the ''ordinary'' tasks for us, we could focus on being productive in innovation-thinking instead of working for a living. We might enter a post capitalism age, where mass-consumption would not be the goal. A new, information economy could happen says Tim Dunlop, author at Melbourne University. [(Dunlop,2016,207)] We can see correlations between being without a job and poor mental health, the question is if the people who lose their jobs are feeling distress and unhappiness because of the capitalistic cultural expectations of society? [(The Atlantic,2015)]

Some professions are harder to replace for example nurses and teachers. The complexity of human social interaction is still too complicated to make a machine learn, they can be taught to recognize faces and facial expressions and react in the proper ways they have learned. But the multiple layers of understanding social interaction might be too complex says Nourbakhsh professor in robot technology at Carnegie Mellon University. [(Nourbakhsh,2013,50-60)] To create AI with functioning human feelings and empathy is unlikely, so it is not likely jobs with a human touch such as nurses will be replaced. [(Dunlop,2016,207)] Machines can be programmed to an extent to make ethical decisions, in traffic and in other automated situations, the complexity of

making the machine perform an ethical decision with all of the possible perspectives is limited. (Winfield,2014,85-69)

AI in the medical field

Scientists are aspiring to make a complete brain simulation with neuromorphic AI. If we could achieve this, we could find ways to look at disorders and diseases in our own brains in a new way. Scientists are also aspiring to understand the whole immune system better. (Bostrom,2014,238) This would make a difference if we could create a sort of sandbox environment to experiment in first, before applying it to humans. If it would be possible for us to understand the complexity of our brain and immune system better it could lead us to revolutionary discoveries says Bostrom(2014).

AI and robotics within healthcare are already highly developed, with AI being able to collect information about many patients and learn to recognise symptoms that often get missed by doctors. Robotics that can help within healthcare including measuring devices. We are also aiming to make robotic prosthetics. Today we have already made prosthetic arms and hands able to perform high precision tasks such as handshakes and cracking eggs. These are controlled by the mind. There are robotic wheelchairs as well. (Nourbakhsh,2013,32-33) According to Silverponds statistics, AI is needed the most in the healthcare sector, in Australia. There is also a demand in the transport and logistics sector. (Silverpond,2019,9)

Which industries are best placed to improve performance with AI?
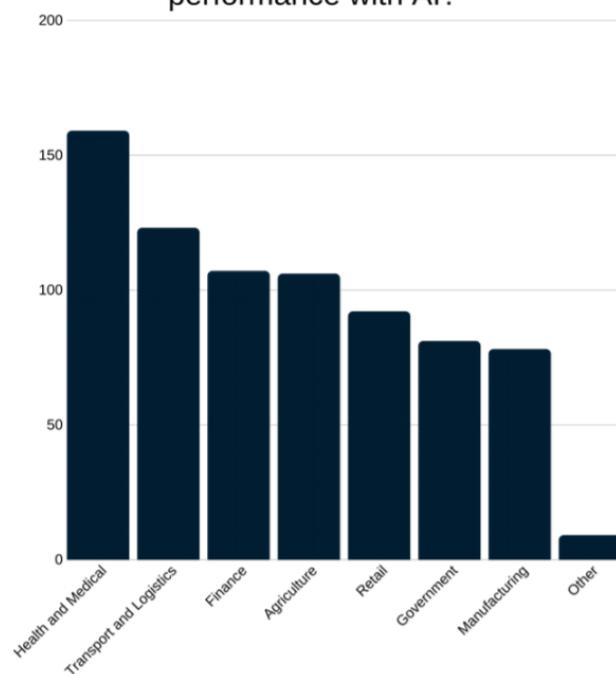
Risks with AI

Often when we think about AI today it is in form of apocalyptic pop culture scenarios; the view of the world being concurred by robots outsmarting humans. Our way of envisioning our future has an impact on how the future get shaped, having sci-fi books written about intelligent machines as the end of the world is in a sense envisioning a possible risk and might make us more careful. [Geraci,2010,5] The theme of us making intelligent life and transcending beyond death is both seen in fiction and in the academic world. [Sorgner,2014,205] What if the biggest threat is not the autonomous machines and the intelligence we create, what if it is the way we integrate it with our minds?

With our phones and computers as an extension of our mind we become like a collective mind and these are powerful tools giving us knowledge, memory extension and more advantages such as instant communication and updated news. If we had devices integrated into our minds for example, inserted, to give better cognitive ability and memory extension what would be the biggest risk? Would there be difficulties for us to tell apart what is inside our minds and what is outside? Hopefully according to Bostrom(2014), our minds will be able to adapt to the new devices and these devices do not necessarily have to be intelligent machines. A simpler way of applying this kind of technology would be to make it visually or audibly accessible instead of integrating it with the brain itself. [Bostrom,2014,47-48] The machines we interact with are human made. What is the human behind the technology aiming for? As a consumer you are giving away your information to the ones controlling the technology, this might be a threat to democracy and the private life of the individual if not regulated. With that kind of power comes great responsibility and we need new regulations and laws. [Nourbakhsh,2013,63] There is also risk of computer systems being breached or infected by criminals. Identity theft and private data in the wrong hands can be devastating for an individual's economy and private life. There is also a risk of cyberattacks on a bigger scale. Important data can be stolen, computers can be infected with malware causing malfunction and damage.[Acorn,2019] In that sense we need a lot of people working with cybersecurity. In Denmark they have suggested compulsory cyber military service to prevent cyberattacks towards the country. [Uppsalatidning,2019]

What if we have accidents, for example with autonomous cars? Who is held responsible? (Nourbakhsh,2013,59) If there were to be an error in healthcare performed by artificial intelligence, who would be held accountable? As our technology develops, we need to update our laws and regulate the way it can be used. (Nourbakhsh,2013,100)

Conclusion

There are multiple risks of having a technology-based society. The risks of system failures and cyberattacks, what if factories stopped working or autonomous cars got errors in critical situations? What if the transition between economical systems would cause instability, causing suffering of the unemployed? We cannot simply turn systems off once we have grown reliant on them, which might be a potential risk. What if information misleads us online, and in what way will we regulate this? On a larger scale there is a problem with who gets to use this ''new'' technology first, we still have very underdeveloped countries around the world and segregation might increase with this new kind of power. Could we use this technology to help underdeveloped countries?

And regarding our arising climate catastrophe could a new information economy contribute to decrease the speed in which we consume the planet to give us more time to use technology to prevent environmental destruction? Will a battery driven society be possible?

Knowledge is no longer locked inside university libraries, and lectures are not only available for students. We can all access information and lectures over the internet if we know how to be source critical.

We might also need to update our school system even further and talk more about how to use the internet, how to be source critical and talk about risks and benefits of using the internet. And if we have online universities in the future, we might need to make sure they are regulated by laws and based on democratic values. How could we shape an online university, and how would the degree system work? We cannot escape human errors, but we can improve and keep innovating solutions to prevent future errors and to keep advancing within our research and science. We can make more laws; how information and data get used to protect the individual and the democracy.

Transhumanism and artificial intelligence

Introduction

Imagine if we could access all the information we needed and remember things better without checking our phone or computer? What if we could live forever through technology? There are ideas of us transcending into a transhuman era and inserting our minds with computers, these ideas are spreading through pop culture and in fields of different academia today. In what we could AI be used in the field of transhumanism?

Historical perspective on transhumanism

Charles Darwin, the recognised 19th century biologist, did not believe in the idea that life was explainable as machinic. Neo-Darwinists long after his time started to explain our biology as a machine, and after, as a computer. This goes both ways. Some of us have started to think; What if computers could become human one day? [Sorgner,2014,205] Post humanist and philosopher Sorger(2014) have asked the question; what if ''artificial selection within machines'' is a kind of extension of ''natural selection within biology''? Machine learning having its own kind of evolution. Is there a parallel between these fields? Could we make comparisons of our evolution and the evolution of the machines? If we look back at the beginning of the science of evolution we all recognize Charles Darwin, but there was a another name; Jean-Baptise de Lamarck. Darwin and Lamarck had different ways to study evolution. Lamarck claimed evolution was striving towards idealisation and that we could change our own DNA through the environment and Darwin had a fixed view; he believed survival was the purpose of evolution and he did not have any specific perspectives upon ideals or longevity says Stefan Lorenz Sorger philosopher at John Cabot University.[Sorgner,2014,205] When discussing modern transhumanism it can be found dangerous links to our past, what is ethically right to do? The term ''eugenics'' will later be brought up in this text. Lamarckism has been linked to this idea of racial hierarchy in eugenics, claims Bowler(2000) a british science historian at the University of Cambridge.[Bowler,2000,457]

One of our first known transhuman thinkers, the well-recognized author Mary Shelley wrote the book ''Frankenstein's Monster'', and this is one of the earliest examples of transhumanism described. The book is envisioning the concept of creating life out of something dead, or creating a human intelligence in an artificial way. It is the human taking over the role as the creator instead of nature or as discussed in the book God. There are parallels to the many dilemmas regarding modern transhumanism that can be linked to this old classic book; what is intelligent life, what defines it, and could we create it? The monster in the famous book is an autonomous creation who gradually learn language and social interaction on his own. The monster gets feelings of loneliness and wishes for Victor Frankenstein to create him a partner. Victor denies his monster this out of fear of making the monsters spread. In the end the monster who saw his creator as both his mother and father, destroys all Victor Frankenstein cared about. Since he made the monster stronger, more

intelligent and more powerful in general than himself physically, Victor did not stand a chance. (Sorgner,2014,258)

What is AI

Artificial intelligence is all around us; we have it in our phones and in our computers. AI adapts to our behaviours collecting as much information about us as possible to shape the online and offline environment based on our interaction online.(Bostrom,2014,18) We can access information within seconds; this gives us advantages when making decisions and remembering information. The data collected is used for multiple purposes, to make us gain the information we are searching for faster, and shaping our environment. (Chance,2018,19) Learning machines teach themselves through their environment to become autonomous.(Bostrom,2014,18) If we created a brain with neural computing and we could make it copy itself, and since it would not have to maintain a body or be distracted by a body, it could focus completely on processing information and problem-solving. It could hypothetically copy itself over and over to improve and develop into a superior unimaginable intelligence, and many today speculate about this change being a risk to humanity.(Shanahan,2015,80-100) This we call superintelligence, super intelligence are built in something called neural networks or genetic algorithms.(Bostrom,2014,18) The neural computers are built with neuron mimicking silicon chips, they do not have consciousness but if there were a lot of these, we don't know what would happen, says Chang founder of an Australian AI company in Melbourne called Silverpond.(Silverpond,2019,18)

AI within the transhuman field

We are aspiring to create a human brain imitation, a brain simulation with neuromorphic AI. If we could, we could look at the functions of the brain in a new way. This could help us to find diseases and disorders. We are also working on AI systems to understand the immune system better, these discoveries would be revolutionary says Nick Boström, a Swedish futurist and philosopher at Oxford university. [Bostrom,2014,238] We are currently working on artificial intelligence collecting medical data, developing a system to diagnose diseases often missed by doctors.[Nourbakhsh,2013,32-33] If we could use AI within medicine in an ethical way we could save lives with our new technology, but considering our past we have to remember what happened in the past with eugenics and take on a very careful approach.

Boström (2014) claims we now have the tools to become technologically immortal, if we put our minds to it. For us to extend and become machines ourselves in various kinds of ways. [Bostrom,2014,124] We have already created robotic prosthetics. Prosthetic arms and hands able to perform high precision tasks such as handshakes and cracking eggs, controlled by the mind. [Nourbakhsh,2013,32-33] For us to transcend into an android, to have a second life in longevity would be a new way of transhumanism.[Geraci,2010,207] Who would get to use this technology first, and what would that mean for a human to live forever?

The risk of AI being used in an unethical way

What happens if we with our new technology redefine disorder and disease, because we can see it in a new way, and repeat our mistake of trying to reach perfection? Eugenics is the historical science of the theories about human racialization. Connecting traits and level of intelligence with race, and thinking disease and disorder was linked to race. [Bowler,2000,441] Eugenics was also used in ''scientific matters'' in world war II in very unethical ways. [Bowler,2000,457] Darwin also applied racialization on humanity. [Bowler,2000,348]

The theme of ideas of us creating intelligent life and transcending beyond death is seen both in fiction and in the academic world. [Sorgner,2014,205] What if the biggest threat is not the autonomous machines and the intelligence we create, what if it is the way we integrate machines with our minds? We have become a collective mind over the internet, what if we could upload our minds to the internet? Or if we had devices inserted into our minds? If we had devices integrated into our minds to give better cognitive ability and memory extension what would be the biggest risk? Would there be difficulties for us not being able to see what is inside our minds and what is outside? According to Bostrom(2014) it could be possible to perform this soon. He discusses about a simpler way of applying this kind of technology, that if we would make the data visually or audibly accessible instead of integrating it with the brain itself. [Bostrom,2014,47-48] The machines we interact with are human made. What is the human behind the technology aiming for? The makers of the artificial intelligence have access to the information and have the power over the consumer in that sense, the consumer being the person interacting with the machine.

Conclusion

Will we make the same mistakes as we did in the past by trying to create ''a perfect human'' but now with our emerging technology? When collecting all this medical data, what if the system gets breached and the and the information gets misused? There is a risk of uneven power balance between consumers and creators.

What do we define as intelligence, and in what way is ''superintelligence'' intelligent? What would be optimizing a human being? Should we be doing that? In what way do we define optimization? Defining intelligence is problematic, and in our history we have made errors in measuring it, when it comes to human intelligence we cannot measure it. Just as we cannot categorize humans as different races and that this would give us different abilities.

Would we be able make ourselves technologically immortal? What would we be if we were no longer in a body, but written in codes, would that still be human?

If we extend our minds with machines what if we biologically change with time? What if, we in the future lost our own biological ability to remember information because we no longer need the ability to do so?

What if we invent a way to create life after death. or our artificial intelligence becomes super intelligent and completely autonomous like Victor Frankenstein's monster? What would be ethically right to do, and could there be unexpected consequences of our inventions in the future?

Appendix on AI and transhumanism

Using artificial intelligence will impact us on all levels of our society's progress, in history we have seen how industrialism and the countries accessing the most resource and industry have become superior. We can see how learning to read have given humanity historically the power to access knowledge, this kind of access to information gave an advantage. Which countries will access the ''new'' technology first and what kind of advantage would that give? Today the amount of information on the internet is vast, you need to learn how to orient online to find the right information. There are risks with this system, governments wanting to shape the information the citizens can read in undemocratic ways. When giving away so much private information there will not be a balanced power relationship between makers of the technology and the consumers.

And if we were to integrate this with our physical beings, there might be a high risk of information in our minds getting corrupt or controlled directly, it might turn out to be like internal propaganda inside of our thoughts. And, the risk of loss of integrity and the self. In the past eugenics was practised as a scientific method, this proved to be dehumanizing and today we know this is against human rights. And now, with all the access to people's private lives it is a specific kind of risk, we need to be careful with what the data gets used for. As we are consumers of these services, we cannot fully understand what we are interacting with. It is dangerous when we do not think critically, analytically and reflect upon our decisions. To integrate analysing and critical thinking along with human rights into education is crucial to a democracy and needed around these questions.

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