

ARTIFICIAL INTELLIGENCE IS CURSE OR BOON

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ABSTRACT

Artificial Intelligence (AI) is a unique innovation. It is different in the way that it has ability to think, reason, and solve problems. The efforts now is towards making general AI which mimics human brain capability. It is expected that AIs will affect almost everything connected to human life e.g. ethics, privacy, security, employment, economy, healthcare etc. Creating intelligent machines is not without concerns and ethical issues when it comes to how safe they will be, and how to ensure that they will not harm humans and other morally relevant creatures. Additionally, how they might differ from humans in concerning ethical issues associated with privacy and confidentiality. Moreover, As AI progress gets accelerated, more robots and autonomous systems will be created and replace the human labor. In contrast, AI has its advantages. It has many applications that would lead humanity towards making this planet a better place to live. If we look around us, on the one hand, we seem to embrace the change being brought by technology, be it smart home, smart healthcare, Industry 4.0 or autonomous cars. On the other hand, we often found ourselves protesting against the government in the context of unemployment, taxes, privacy etc. As AI development is speeding up, more robots or autonomous systems are being born and replacing the human labor. This is the current situation; however, in long-term, results seem to get more interesting. Throughout this essay, we will cover the major domains where human life is significantly affected by AI in both positive and negative ways.

Keywords: Artificial Intelligence, Law, Privacy, Employment, Singularity.

INTRODUCTION

Artificial Intelligence (AI) is a unique innovation. It is different in the way that it has ability to think, reason, and solve problems. The efforts now is towards making general AI which mimics human brain capability. It is expected that AIs will affect almost everything connected to human life e.g. ethics, privacy, security, employment, economy, healthcare etc. Creating intelligent machines is not without concerns and ethical issues when it comes to how safe they will be, and how to ensure that they will not harm humans and other morally relevant creatures. Additionally, how they might differ from humans in concerning ethical issues associated with privacy and confidentiality. Moreover, As AI progress gets accelerated, more robots and autonomous systems will be created and replace the human labor. In contrast, AI has its advantages. It has many applications that would lead humanity towards making this planet a better place to live. Throughout this essay, I will be answering whether we need to make them or not by arguing the advantages and disadvantages of AI. For every technology to survive, its advantages have to outweigh its disadvantages. Most of disadvantages of AIs are associated with ethics and concerns that AIs bring to human society.

It may look scary to many people. Some say it will save humanity, and others say it destroys us. Either way, if it happens, the world will be changed forever.

What is Artificial Intelligence (AI)?

When babies are born there is actually no so much information about this world in their heads, but gradually they learn about the things around. In their very early ages, they learn to suck, swallow, and grasp. Lately, they become a sophisticated human being that can think, reason, plan ahead, and solve problems. That is called child development. Most humans go through a series of life periods and learning processes to earn information, recognize different things, speak different languages, and even design advance machines like a robot. That is obviously the power of the human brain that is incredibly able to learn quickly, think deeply, and adapt remarkably with new stuff

One of the most advanced machines that the mankind has ever built is computer. According to the Oxford dictionary, a computer is “an electronic device for storing and processing data, typically in binary form, according to instructions given to it in a variable program.” However, computers can only do what they have been taught by humans. They cannot learn by themselves and solve problems without the humans’ support. A question which’s drawn most computer scientists’ and engineers’

attention for many decades is whether it is possible to build a computer mind that can think, learn, and behave like a human? This research discipline is called Artificial Intelligence (AI) nowadays.

The term of AI is first coined in 1956 by the great American computer scientist, also called Father of AI, John McCarthy at the Massachusetts Institute of Technology (MIT). This newest field of study emphasizes the creation of intelligent machines in a way that mimics human brain intelligence, a computer mind that can think and act humanly and rationally . AI is actually a branch of computer science with the contributions from other scientific disciplines such as Biology, Psychology, Linguistics, Mathematics, and Engineering. The main motivation of AI is to develop computer functions correlated with human intelligence

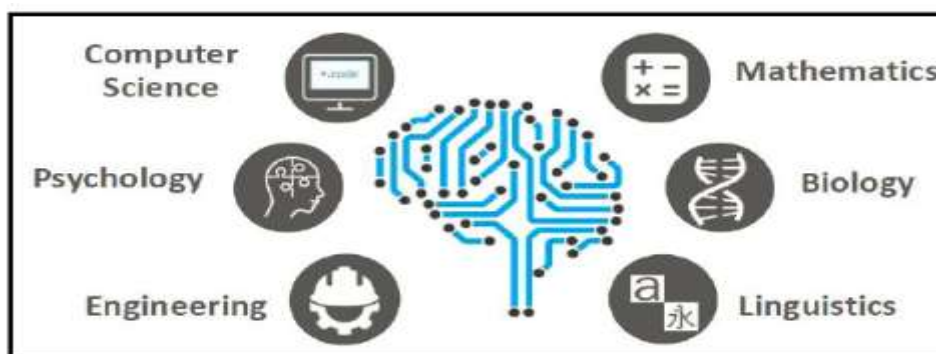


Figure 1. AI is based on various disciplines

AI - Curse or Blessing

There is no right or wrong, good or bad, left or right when it comes to the topic of Artificial Intelligence. What we know is that it is growing and improving at an exponential rate and that there is a high probability of machines eventually outperforming humans. In which way, this

will go? Nobody knows. It is barely predictable, and we, as human beings can be excited about the future and the many innovations to come.

Factors that support AI to be a Boon:

- **Ease in Availability:** Machines do not require refreshment like humans and can work for a longer period. They are capable of performing tasks and work continuously and produce quality output.
- **Daily Usage:** Currently the most widely used machine in our daily life is a smartphone, which results knowingly and unknowingly using the benefits of AI. A few examples that demonstrate the use of AI in our daily life are speech recognition system used in our search engine on our smartphones, GPS used for navigation and fingerprint recognition and face recognition system in our smartphone for security.
- **Performing Complex Tasks:** For a human performing tedious task is time-consuming. AI algorithms are developed to perform complex tasks. Machines are capable of performing multiple tasks at a particular period and function faster than humans.
- **Virtual Assistants:** Virtual assistants communicate with various users, thus resulting in less use of manpower. As machines do not have emotions they perform more logically and efficiently and thus arrive at the right decision.

AI as a Bane:

- **Incurs High Cost:** With the use of AI the productivity enhances and efficient results are obtained but huge costs are incurred in the process as machines are very complex and complicated in their training. And machines require regular maintenance at a particular point of time thus resulting in bigger costs to incur.
- **Lack of Experience:** Humans depend upon their experience and perform accordingly in the future whereas do not have experience. Machines act according to the algorithm that is set for its functioning. They do not react with the environment and this what creates the difference between machines and humans.
- **Unemployment:** The growing concern in the global economy today is that will AI completely take over human jobs. To enhance the productivity enterprises are adopting AI-based technologies that are now replacing human jobs and making us more dependent on machines. This would lead to a major loss in the ability of thinking and result in creativity and ideas.

The main concerns of AI

The most controversial issue associated with AIs is the intimidations that they will probably bring to human society. The development of AI is happening magically fast . Some

researchers and developers think that AI could grow extremely strong, and it would become problematic for humans to control. AI systems are developed by introducing into them as much human intelligence as possible, such as capacity for logic, understanding, self-awareness, learning, emotional knowledge, planning, creativity, and problem-solving. If it happens, the humans themselves will seem to be threatened, and that might be a big threat to our safety. The self-optimizing AI systems can become super-intelligent and outperform human intelligence. Then, it could be very difficult to stop them from realizing their goals, which may lead to unintentional consequences. Stephen Hawking, who is one of the most influential scientists alive today, believes that humankind is in danger of self-destruction due to AI. In his interview with WIRED Hawking said, "A super-intelligent AI will be extremely good at accomplishing its goals, and if those goals aren't aligned with ours, we're in trouble." Other big names within science and technology have the same anxiety as Hawking does. Michael Vassar, an AI expert and the chief science officer of MetaMed Research, believes that artificial super-intelligence will annihilate humanity if we do not approach AI with significant caution. He also served as the president of the Machine Intelligence Research Institute. In a video posted by Big Think, he states that, "If greater-than-human artificial general intelligence is invented without due caution, it is all but certain that the human species will be extinct in very short order". The Swedish philosopher, Nick Bostrom, who is well-known for his work on AI, thinks that the problem of control has to be solved before superintelligence is brought into being. Otherwise, upcoming developments in artificial intelligence investigation may pose a supreme hazard to humanity. This threat has made Elon Musk, a famous businessman who is the co-founder and CEO of many large companies such as Tesla Inc., to warn us about the threats that AI will make without any regulation and restriction. For that reason, in December 2015, he announced OpenAI which is a non-profitable artificial intelligence (AI) research organization. He aims to secure the safety in building Artificial General Intelligence (AGI), in a way that is beneficial to humanity.

OBJECTIVES OF THE STUDY

To Study on Artificial Intelligence

To study on Research Methodology

The analysis methodology wherein a special focus will be put on interdisciplinary analysis methods, combining economical prognostics, the historical development of technologies, and systematic description of the various threat scenarios.

Applicability of Results

Issue related to the application are mainly concerning the development of a framework which helps us to eliminate the problems which are connected to the rapid development of AI. However, some of the domains where the results can serve might include the following:

- AI research framework: Creating a system of research and development which can help us fight with existential risk from Artificial General Intelligence (AGI). One such system which is recently established by Tesla CEO Elon Musk is known as OpenAI.

- Economical and Governmental agents: Understanding the process of AI development while it is still adjustable, becoming aware of issues arising and actively taking part in designing the future with policies and informed future planning.
- Legal Aspects: Creating a legal framework in order to avoid all the consequences and make sure no harm is done to society and in turn to humanity. Such a legal framework is becoming a need as AI development is rapidly moving on its way

DATA ANALYSIS

VERIFICATION

In the recent years, there have been several advancements in the development of AI. For many years it was used for various internet based activities e.g. advertisement, web searches etc. Now it is gaining more commercial fame than ever before. The current state of the art in AI research makes it more competent in some domains than humans, however, it is part of narrow artificial Intelligence (also called Weak AI) which is more focused on a narrow domain of problems e.g. iPhone Siri. In 2015, several milestones achieved in the research and development of AI gave rise to Artificial General Intelligence (also known as Strong AI) and this kind of AI can be applied all kind of problems. In cognitive science, intelligence is defined in many ways which include one's capacity for reasoning, logic, understanding, planning, problem solving, self-awareness, and emotional knowledge etc. A Human-level intelligent machine should have an ability to pass several tests; one of such tests is the Turing test. However, there is no perfect test which can prove a machine perfectly human-level intelligent.

Current state of AI:

If we look at the current state of AI, the pace of evolution of artificial intelligence is speeding up. NIPS (Neural Information Processing Network) conference is one of the most famous conferences in the field of Machine Learning & computational neuroscience. It is the same conference wherein 2013, Facebook CEO, Mark Zuckerberg announced to form an AI laboratory and a start-up called DeepMind boastfully displayed an AI which can easily learn to play computer-based games. Afterwards, DeepMind was acquired by Google. However, Artificial Intelligence is not new, it was first coined by the American scientist John McCarthy in 1955, who is also considered co-founder of the field Artificial Intelligence. The term 'Robot' was first coined by Karel Čapek in his play R.U.R (Rossum's Universal Robots) in 1921. So research in the field of AI has been done since decades, but the conditions were not appropriate for AI to flourish. Nowadays, we have cloud computing to store torrents of data remotely & inexpensive neural network technology which is crucial in learning, which was very expensive back then. Given the fact conditions for AI nowadays are right, largest companies in tech-industry e.g. Google, Facebook, Microsoft and IBM have dived into AI research, where they see a huge potential. Below are some of the images which empirically show the growth in AI domain in recent years:

Computers Stop Squinting and Open Their Eyes Error rates on a popular image recognition challenge have fallen dramatically since the advent of deep learning systems in the 2012 competition.

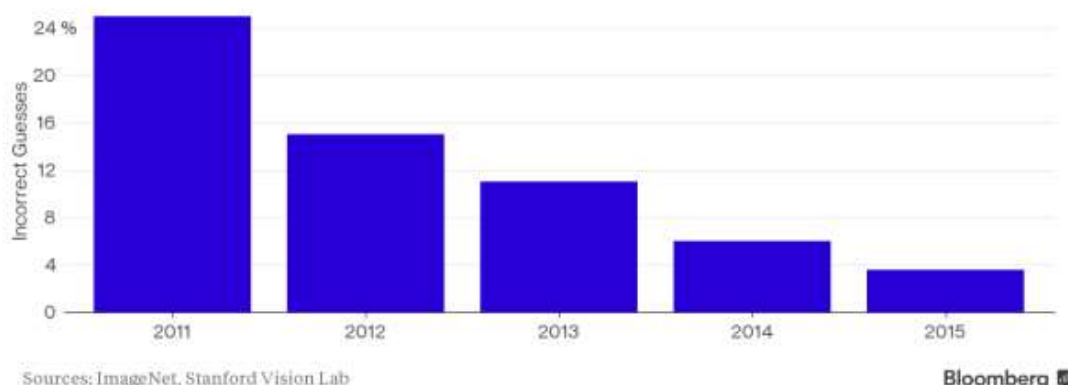


Fig. 2: Error rate fall over recent years (Clark, 2015)

Since Google’s acquisition of DeepMind, they are working intensively on making its AI better at playing old Atari games. Below is the bar chart which shows the growth in accuracy of their AI:

Play It Again, HAL Google researchers have spent the past two years working out how to help their AI systems master old Atari games, and their systems have got much, much better.

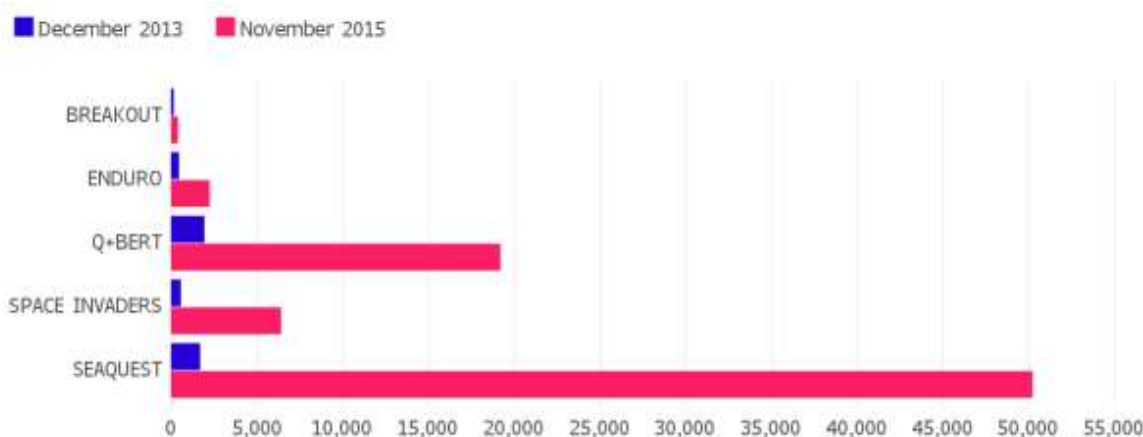


Fig. 3: Accuracy in Google’s AI at playing old Atari games (Clark, 2015)

Techniques (Deep Learning) & Companies (IBM, Google, Facebook, Microsoft, OpenAI):

Deep Learning is one of the most growing research areas in the domain of Artificial Intelligence. It facilitates to build and train neural networks. Neural networks provide the foundation for learning and decision making in AI systems. Hence, deep learning lays down the framework for the Strong AI also known as Artificial General Intelligence. In order to create human-level machines intelligence, it is important to achieve advancements in Strong AI because well-structured problems e.g. chess, are solvable by AI, while ill-structured problems e.g. real world, are still relatively difficult for AI like the Winograd Schema Challenge (an alternative to the Turing test based on contextual language understanding and common-sense knowledge etc.)

After putting a lot of effort to develop narrow AI based intelligence, now tech-industry giants are going towards Strong AI, which is the generalization of narrow AI. Unlike Narrow AI, Strong AI is focused on a problem domain which can consist of any problem in the real world. Deep learning is the basis for Strong AI and tech giants like Google, Facebook, Microsoft, and

IBM are investing in the research and development of Deep Learning. Each of these giant companies has their own laboratories, where they carry out the state of art research in AI and publish it every year for the academic community. In 2015, Google published their AI system (in a scientific journal called Nature) that learns and plays video games on its own without directions. Facebook built an image recognition system which can recognize images automatically and can interpret them for blind people. Microsoft boastingly presented a new skype based AI system which can translate from one language to another automatically while IBM indicated AI as one of its highest potential growth areas. IBM is working on its wellknown AI system named Watson, who was the winner in the Jeopardy! competition in 2011. Companies like Google have even started utilizing Deep Learning in their current running projects to improve their services. Below is the empirical representation of the usage of deep learning into their projects:

Usage:

As AI research is progressing with a fast pace, a lot of companies are looking forward to utilizing its power to improve their services. The largest U.S. retail company, Walmart, is trying to build robotic shopping carts, while Amazon is developing robots for its fulfilment centres that will serve the delivery between stacker and pickers.

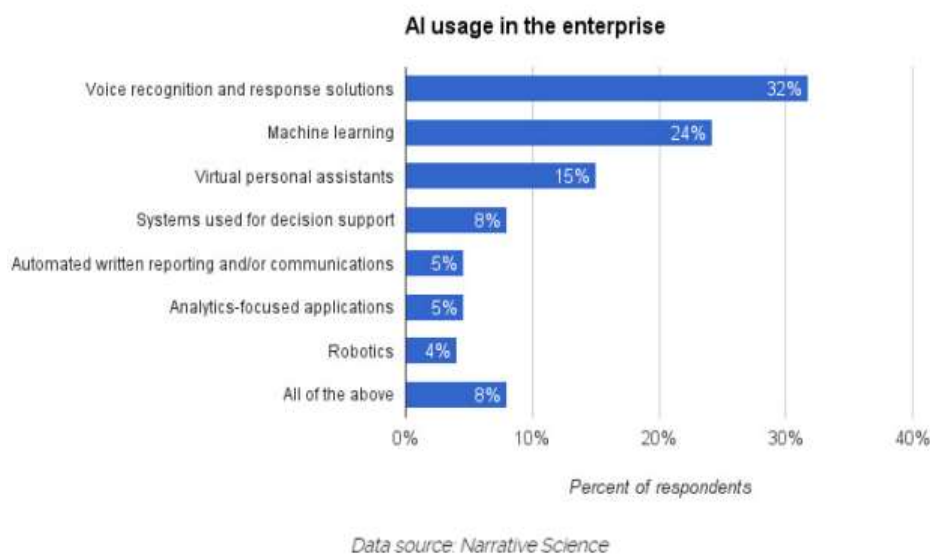


Fig. 4: Usage of AI technology in Enterprise (Clark, 2015)

The automobile industry is investing a vast amount of money to embed AI into cars. In fact, Tesla Motors has already introduced AI into their cars which enable auto-pilot mode and other lane changing features. Toyota is investing billions of dollars to combine Artificial Intelligence with Big Data to facilitate mobility assistance both in & outdoor driving for people who are less confident to drive. It's a big opportunity for the industries who are leaders in AI to build self-driving cars. Hence, the tech giants Google and Apple are investing a huge amount of money to dive into this market.

Google has recently launched an open-source version of its Artificial Intelligence engine named TensorFlow. Tensor came out of 'Google Brain' project which is used to apply various neural

network machine learning algorithms to various product and services. Google uses this engine in various product and services. Now researchers outside of Google are using this engine to test their algorithms. Hence, there is a huge potential in this technology for the usage at various commercial levels.

Next Steps of AI:

The next steps in AI mostly include generalizing the intelligence and create as many use cases as possible, which eventually can be converted into HLMI. OpenAI wants to further advance AI in a way that benefits society as a whole and is freed from the need of generating revenues. As OpenAI has already made its reinforcement learning framework public, it will create possibilities for other companies to create different use cases and contribute to the AI research as an open source project.

Other companies have also started to make use of AI technology into different domains. One such example is Turing Robot, a Chinese company which is behind the HTC's Hidi, a voice assistant. Turing Robot offers Voice recognition and natural language processing for a wide variety of applications including Bosch's car system and Haier's home appliances. Now Turing Robot is focused on developing Turing OS for service bots. Another use case is being developed by Amazon, which is working on developing Alexa in the direction of recognizing emotions. Amazon is making significant advancements in Alexa – which is a virtual helper which sits inside the voice-controlled appliances offered by Amazon. While people get irritated from the repeatedly wrong response from voice assistances like Google Now, Siri, Hidi etc., Amazon focuses on emotion recognition from the voice tone and enable voice assistance to offer an apology for a wrong response. Similarly, a silicon valley based company named Vicarious is developing an entirely a new way of information processing akin to the information flow in human brain which they believe to help machines to become a lot smarter.

Toyota is developing a system which will predict where you are going before you tell it. Toyota has recently announced its new subsidiary named Toyota Connect which will facilitate to collect torrents of data every day and the battle to mine the data already been started. Thus, in the future, your AI will know more about you than you do. A start-up called Brain of Things is developing a smart home which they named 'robot home'. These robot houses keep an eye on each activity of the inhabitants -- whether they are watching a movie, sleeping or doing something else. There are lots of advancements made in different domains all using AI technology while developing it further in parallel to achieve their desired results.

Problem Related to AI:

Artificial Intelligence has impressive capabilities today but they are narrow in nature. However, as researchers are fighting to widen up those capabilities to make it as general as possible, it seems that AI will eventually reach HLMI which then will facilitate machines the ability to solve any intellectual task which a human can solve. Looking into the future from here makes it difficult to figure out, how much benefit HLMI can bring to society and it is legitimate to ask, how much harm it could bring to society if we build or use it incorrectly. In the near term, automation of services is also going to impact on employment and AI is going to play a major role in making that possible which apparently seems to bring more benefits to big

enterprises rather than to society as a whole. Considering for a moment what will happen when, in near term, we have a reliable driverless car system. Thinking about all the drivers -- whether they are Uber drivers, train drivers, plane pilots or ship captains -- how long will those jobs be held by humans? Besides, our dependency on AI based services like using navigation, voice assistance, etc. is also putting our privacy on the verge. There are many such issues which are connected to AI and its development which nowadays are in the debate.

Among AIs:

Once AI reaches human-level intelligence, further development of self-optimizing AIs is unpredictable. The output will then no longer be approvable by humans for errors and conclusions drawn might be beyond human understanding capacities or even beyond human ethics.

The main issues here are problems with the agency, where autonomous machines will need to become a legal entity like companies at one point – independently of the question if a code (algorithm) can be fined in the end. This connects to the possibility of failure and responsibility of such AIs. The second main issue is formed by moral implications, especially since machine learning does not necessary include human teachers anymore and, if not asked to do so, AIs will not necessarily focus on learning what humans count as valuable acts. Prof. Stephen Hawking -- one of Britain's prominent scientists -- warns that our efforts of creating a thinking machine pose a threat to our very existence. He said that the development of the superhuman intelligence could spell the end of humanity

Between AI & Humans:

Moral Issues:

As soon as AI is able to compete with humans, it will not only lead to a fight for jobs on an economical level but maybe even intrude human relationships in the way that an AI-friend will only focus on its owner's needs, whereas a human relationship flourishes through the exchange of favours (e.g. portrayed in the movie "Her"). Another interesting scenario has been portrayed in the very recent movie called Ex-Machina, where a humanoid robot named Ava who already passed a simple Turing test and eventually shows how she can emotionally manipulate humans. Ultimately, the question arising here is what happens when our computers get better than we are in different areas of life..

Economical Impacts:

A recent bid for the acquisition of a German robotic company Kuka by a Chinese company called Midea Group was \$ 5 billion. Kuka is one of the world's largest robotic companies. China is famous for low-paid migrant labour and Chinese enterprises want to automate the manufacturing process because they do not see any point to rely on such a huge low-paid migrant labour. According to International Federation of Robotics, China is the largest importer of robots . The IFR's calculations show that China has 326 robots per 10000 workers while the US and South Korea have 164 and 478 robots respectively for the same number of workers. Thus, enterprises are seeing a lot of potential in automation of their processes but it will have

a negative impact on employment. The Figure below statically explains the impact of technology on employment:

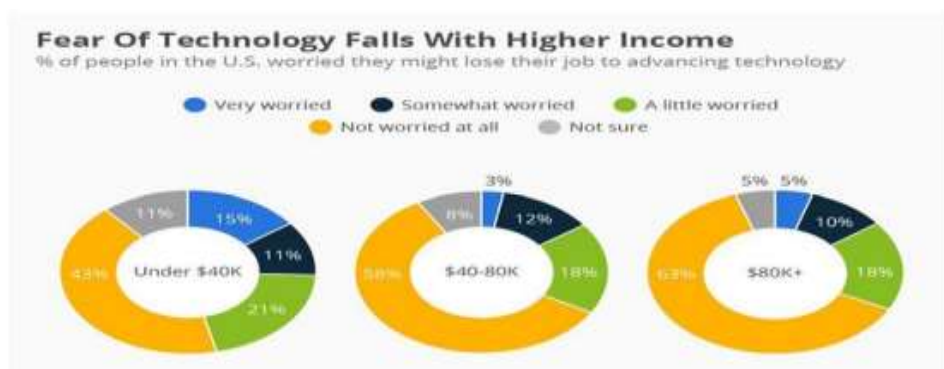


Fig. 5: Percentage of people who are afraid of technical advancements (McCarthy, 2015)

Among Humans: If not consciously planned, power structures -- especially the widening of the scissor between powerful and powerless -- will impact the political and social freedom both locally and globally. Surveillance, intensification of economic power, etc. are some of the issues raised along with this concern. On the other side, AI is delivering to humans -- what is suitable for them rather than what humans like -- which will intensify their views and most likely lead to boost extremism in all directions.

Political & Social Issues

AI is helping us on one hand and creating really serious issues on another. Considering the scenario from Baidu and its web search and map services, Baidu has around 700 million users out of which around 300 million use its map services every month. Baidu's research indicates as how the digital footprints can be used to determine the city dynamics. Baidu is mining its data for the city planners to suggest them the right spot to put transportation, shop, and other facilities etc. On the other hand, such kind of mining might also help the government to put a control over society. Baidu's researchers are training their machines to predict crowd problems based on the analysis of user's online map queries. They can predict three hours prior to when and where a huge number of people might gather. While Baidu claims that the data is anonymous, this could be used to also do malicious research. Some examples might include influencing elections based on data which reveals a lot about the behaviour, trend, interest of people, etc. This, in my opinion, is nothing but a serious threat to democracy.

DISCUSSION

Possible solutions for all the problems we discussed throughout this essay might include some of the followings:

- We have to consciously define how we are going to use AI as well as when and where it will be used.
- At the moment, it is really difficult to predict when we can reach singularity despite the fact that there are several predictions by some AI experts.

- However, if we reach that point in the future, then it is really important to have a centralized global governing body which lays down the framework for prioritizing the positive outcome over its own interest.
- Initiatives like 'One hundred years study of Artificial Intelligence' by Stanford university is necessary to carry out long-term analysis of AI development which will help us to figure out long term harm which AI might bring to society .
- Build a system of checks and balances with several AIs, so that they can check on each other and, as a whole, can act as dependency network for decision making.
- As far as the ethics of AI is concerned, we certainly need an ethic charter for the further development of Robotic research and we need to set up operational ethics committees for robotic research advancements.

Public bodies have to speed up for decision making about the change technology is bringing as of now they are way too slow as to cope with the exponential growth of technological advancements and that could be a possible solution to mitigate the challenges of the impact of AI on employment and economy.

CONCLUSION

It seems that we are standing at the point on the timeline where it is really difficult to foresee the future of humanity in the context of Artificial Intelligence. We always embrace new technologies which seemed to be changing our way of living. However, the important fact here is that the kind of change we are embracing must bring a positive outcome for the welfare of society and eventually of humanity. Artificial intelligence is the kind of change which we certainly should not take for granted. It is different than any other technology which humanity has ever developed and the fact which makes it unique is its ability to act autonomously. It is the change which not only starts exhibiting soon its positive impact on society but severely negative impacts, too. So, if we are embracing it as a change which is expected to change the way we live, then we should be happily ready to face the consequences whether it is related to employment, privacy, or eventually the very existence of humanity. However, whatever the case will eventually be, we certainly need a legal policy framework which can make sure to mitigate the challenges associated with AI and compensate the affected parties in case of a fatal error. Hence, I conclude that if we keep ignoring social bugs of AI, it could be a serious threat to humanity

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