Hung Nguyen NBMS15K

ARTIFICIAL INTELLIGENCE AND ITS IMPACT ON WORKFORCE

Job Clarification

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ABSTRACT

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The aim of the thesis was focusing on one the most important element which could make a tremendous shift on the human live, Artificial Intelligence (AI). It is an unpredictable and limitless potential source, and no one knew exactly how the world will be in the future. The more you know about AI, the scarier you will get. We are in the golden time of our species. Most likely there is nothing can stop us, from discover the space to get our hand on human genetics. We can change the weather; even we are not tending to do it. Even though, there is one thing that we cannot control, it is AI. At the first part of this thesis, we went back to our history; back to 1950s when the first AI was born then took a trip from that time till today and saw how sciences developed AI after over 60 years.

However, it is not a technological report on what is AI and the way it changes our life. This thesis mainly aimed to examine how it affects the business in term of job creation. I interested in this field of business because I am in the last days of my student's time and thinking about what I am going to do in the future from now is necessary.

Key words
Artificial intelligence, automation, machine learning, deep learning.

CONCEPT DEFINITIONS

Artificial intelligence (AI): An area of technology that focuses on how to build a machine can work like human including receive, analysis data and decide what to do all by itself.

Automation: An area of technology which is a process of machine doing one or several tasks without human assistant.

Deep learning (~Machine learning): An area of AI which a computer system receive data from several sources like human voices and images then decide what to do with those data to perform one or several tasks. Deep learning is a subset of Machine learning. Machine learning is a subset of AI.

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1 INTRODUCTION

The aim of this thesis is finding a solution for people concerning about what we, graduated students, are going to do in the next few years? Basically, the question is not something new, not for any students. But for now, students will need to know a brand-new field of information technology to answer that question. The existence of AI is giving mankind a big question mark, even top sciences in the world now cannot fully understand what it is and how it works also what they can do with it. However, there is no doubt about the power of AI. It will become a tool that will shape the world in the next few years.

If we look at the history of mankind, our society was changed by the achievement of human of a new material or element. The world changed when a new production tool was found. From using stone as the first production tool until using nuclear element to produce power, the world had been shaped several times. The next production tool which has the potential to redesign the world one more time is AI. Mankind are very close to the next generation of society when some leader organizations in technology like Google, Amazon or Testa used AI to build their own production tool.

I have been followed the progress of using AI of some top technology company from all over the world for a few years. There are some wonderful products were made by those company but all of them is just the beginning. Even the progress is going very fast, what those top organization can do is clearing the surface of AI. They are trying to dig deeper to get higher knowledge about AI and the world will be shaped right after they found it. This report is just a part of my research about the impact of AI in workforce. When AI redesigns the world, the first thing people concern is how they keep their 3 meals each day. We cannot tell other exactly how the future will be, but we can predict. Thus, I cannot give a correct answer for the above question, but it will be a reasonable answer.

2 ARTIFICIAL INTELLIGENCE

The term Artificial intelligence known as AI appeared for the first time in 1956 at a small conference at Dartmouth College, New Hampshire (Brighton 2015). Since then, lots of sciences in many fields such as computer sciences or even in philosophy are still arguing about what is an AI? And how could you define a machine or computer program or whatever you have in your lab is an AI?

2.1 The definition of AI

Before I start to explain the term AI, let me take you back to a very basic idea, what is Intelligence? How could you recognize that dog is smart or intelligent? Because it can catch a ball, can pick up a newspaper, can sit down or get up when you say so. I say that dog has intelligent behaviors. All kind of behaviors that dog do to maintain its biological body such as eat, sleep, breath, bark, run is natural behaviors or so-called instinct. Then, all kind of behaviors that different than instinct and also aim to achieve a specific goal is intelligent behaviors. For instant, that dog again is not just run around but it knows how to run and jump to catch your flying stick, that action so called intelligent behaviors. Then people will say it can think. In short, a dog or human that can think is an intelligent subject.

After you get an idea of intelligence, we can move to our main term: AI. After mankind knew about machine, understand how to build and use it, they won't stop there. That is never enough. Human always curious about everything and they started to imagine is it possible that a machine has intelligent behaviors? Can a machine think? Then they started to dig deeper and deeper in computer sciences. They figured out the connection between a program and computer had the same idea with the link between mind and brain. All human and animals have the connection between mind and brain. But how could a dog become a smart one, how could a child become smarter? If a child is only growing up his/her biological body, except her brain then he/she is always a child lives with his/her own instinct. Being smart based on the ability to learn and improve. A dog or a child both needs to learn and improve to has intelligent behaviors. Go back to our main subject, a machine, so in order to make a machine has intelligent behaviors, sciences need to build a machine that has ability to learn and develop.

This is where the term machine learning came from, the foundation of AI. An AI is computer program, or a robot has the ability to learn and improve to solve problem as usually being done by human or an intelligence subject. There are many definitions of AI, some are more "intelligent" than the other, here they are:

- AI is "a branch of computer science dealing with the simulation of intelligent behavior in computer."
- AI is "the capability of a machine to imitate intelligent human behavior."
- AI is "a computer system able to perform tasks that normally require human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages."

In the book Introducing Artificial Intelligence: A Graphic Guide of Henry Brighton, he divided AI into 2 forms: Strong AI and Weak AI (Brighton 2015). There is nothing much to talk about Strong AI, so called Artificial General Intelligence (AGI). AGI is a form of intelligent machine which can perform completely all kind of task as a normal human. Sciences just had a feeling that AGI will appear, but no one can say for sure what when or how it happens. In another hand, they are closed to weak AI. It is a weaker form of AI in compare with AGI which can solve some specific problems or perform specific tasks as a normal human, not all.

John McCarthy initial coined the term AI in 1956 once he invited a bunch of researchers from a spread of disciplines as well as language simulation, vegetative cell nets, quality theory and a lot of to a summer workshop known as the Dartmouth Summer research on AI to debate what would ultimately become the sphere of AI. At that point, the researchers came along to clarify and develop the ideas around "thinking machines" that up to the present purpose had been quite divergent. McCarthy is alleged to possess picked the name AI for its neutrality; to avoid highlight one in every of the tracks being pursued at the time for the sphere of "thinking machines" that enclosed information processing, automata theory and sophisticated information processing. The proposal for the conference aforesaid, "The study is to proceed on the idea of the conjecture that each side of learning or the other feature of intelligence will in essence be thus exactly represented that a machine will be created to simulate it." (Marr 2018.)

Today, fashionable lexicon definitions specialize in AI being a sub-field of applied science and the way machines will imitate human intelligence (being human-like instead of changing into human). English Oxford Living Dictionary offers this definition: "The theory and development of laptop systems ready to perform tasks ordinarily requiring human intelligence, like beholding, speech recognition, decision-making, and translation between languages."

Merriam-Webster defines computer science this way:

- A branch of applied science coping with the simulation of intelligent behavior in computers.
- The capability of a machine to imitate intelligent human behavior.

Definitions of AI begin to shift based mostly upon the goals that try to be achieved with associate AI system. Generally, folks invest in AI development for one in every of these 3 objectives:

- Build systems that assume precisely like humans do. (strong AI)
- Simply get systems to figure while not determining however human reasoning works. (weak AI)
- Use human reasoning as a model however not essentially the top goal.

Turns out that the majority of the AI development happening nowadays by trade leaders falls below the third objective and uses human reasoning as a guide to supply higher services or produce better merchandise rather making an attempt to attain an ideal reproduction of the human mind.

Amazon builds a great deal of its business on machine-learning systems (as a set of AI) and defines AI as "the field of engineering science dedicated to finding psychological feature issues usually related to human intelligence, like learning, downside finding, and pattern recognition." Machine learning is therefore vital to Amazon, they expressed, "Without metric capacity unit, Amazon.com couldn't grow its business, improve its client expertise and choice, and optimize its provision speed and quality."

Machine and deep learning are the priority for Google AI and its tools to "create smarter, a lot of helpful technology and facilitate as many folks as possible" from translations to health care to creating our smartphones even smarter. Facebook AI analysis is committed to "advancing the file of machine intelligence and are making new technologies to provide folks higher ways that to speak." IBM's 3

areas of focus embrace AI Engineering, building ascendable AI models and tools; AI technical school wherever the core capabilities of AI like language process, speech and image recognition and reasoning are explored and AI Science, wherever increasing the frontiers of AI is that the focus.

In 2016, many trade leaders together with Amazon, Apple, DeepMind, Google, IBM and Microsoft joined along to form Partnership on AI to profit folks and Society to develop and share best practices, advance public understanding, give associate open platform for discussion and to spot aspirational effort in AI for socially helpful functions. Those operating with AI nowadays create it a priority to outline the sector for the issues it'll solve and also the advantages the technology will have for society. It's not a primary objective for many to induce to AI that operates a bit like a personality's brain, to use its distinctive capabilities to boost our world. (Marr 2016)

There is another point to explain more about AI, weak AI and strong AI. I have to admit that the author of this idea had the point. Let's say AI is one or more devices being designed to act intelligently (Marr 2016). He changed the term weak-strong AI to applied and general AI. He explained a litter bit deeper with more detail about what they are. Applied AI is quite common, he said we, anyone can find them in trading in stock market or autonomous vehicle. About general AI, it is less common than applied AI. Sciences and researchers, they liked this term because it has more potential than applied AI and they also preferred general AI with the term Machine learning, which you can find below with more detail.

I don't want to talk too much about AI. It's not my main idea in this thesis. I am studying business, not computer sciences. I focused on what AI can do in term of help me get some money easier and faster. As I said above, AI is just a tool which can help us do thing easier. Even though, there is something I need to mention about AI, a litter bit deeper, something professional. I give you 3 names: AI, Deep learning and Machine learning. I already mentioned about AI before so here is some basic knowledge of Deep learning and Machine learning.

2.2 The definition of Machine learning

To make it easier to understand, Machine learning is a subset of AI, or an application of AI (Marr 2016). For professional, machine learning is a category of algorithm which being built to receive input data then use it based on statistical analysis to predict output data while keep updating output data as new input data (Rouse. 2019). Human, they are too lazy to spend all day in front of a screen and upload data into database so they invent a "machine" which can search, access, upload, save and create database - basically can "learn" by themselves. Another point which human preferred a machine can learn by itself because of Internet. Let's imagine the size of data in Internet, no one can sit in front of computer screen all day to upload those data into a machine, just connect that machine with Internet let them be. The question is how human teach a machine "learn" something? How can we define "learn"? The answer is Neural network. It is a computer system designed for classifying data in the same way human brain does with knowledge (Marr 2016). Based on recognizing image, color, size, text, all kind of elements which data contains, a machine can divide it into difference groups. Then depend on any requirement from human, the machine can give you the group of data you want. You can imagine how much time you can save with machine learning technology in all kind of industry, at the time of free access to internet at anywhere, anytime.

Machine learning is a synthetic intelligence (AI) discipline meshed toward the technological development of human information. Machine learning permits computers to handle new things via analysis, self-training, observation and knowledge. Machine learning facilitates the continual advancement of computing through exposure to new situations, testing and adaptation, whereas using pattern and trend detection for improved selections in future (though not identical) things. Machine learning is usually confused with data processing and information discovery in databases (KDD), that share the same methodology. It's troublesome to copy human intuition in a very machine, primarily as a result of persons typically learn and execute selections unconsciously.

Like kids, machines need AN extended coaching amount once developing broad algorithms meshed toward the dictation of future behavior. coaching techniques embrace memorization, parameter adjustment, macro-operators, chunking, explanation-based learning, clustering, mistake correction, case recording, multiple model management, back propagation, reinforcement learning and genetic algorithms.

Moreover, I give you more detail about how machine learning works in theory and reality also dig a little bit deeper on neural network. AI calculations are regularly sorted as supervised or unsupervised. Supervised calculations require an information researcher or information expert with AI aptitudes to give both input and desired output. Information researchers figure out which factors, or highlights, the model ought to break down and use to create expectations. When preparing is finished, the calculation will apply what was found out to new information.

Unsupervised calculations should not be prepared with wanted result information. Rather, they utilize an iterative methodology called deep learning to audit information and come to conclusion. Unsupervised learning calculations - additionally called neural network - are utilized for more unpredictable handling errands than supervised learning frameworks, including picture acknowledgment, discourse to-content and characteristic language age. These neural network works by going through many instances of preparing information and consequently recognizing frequently unpretentious connections between numerous factors. When prepared, the calculation can utilize its bank of relationship to translate new information. These calculations have just turned out to be possible in the period of huge information, as they require enormous measures of preparing information. (Rouse 2019).
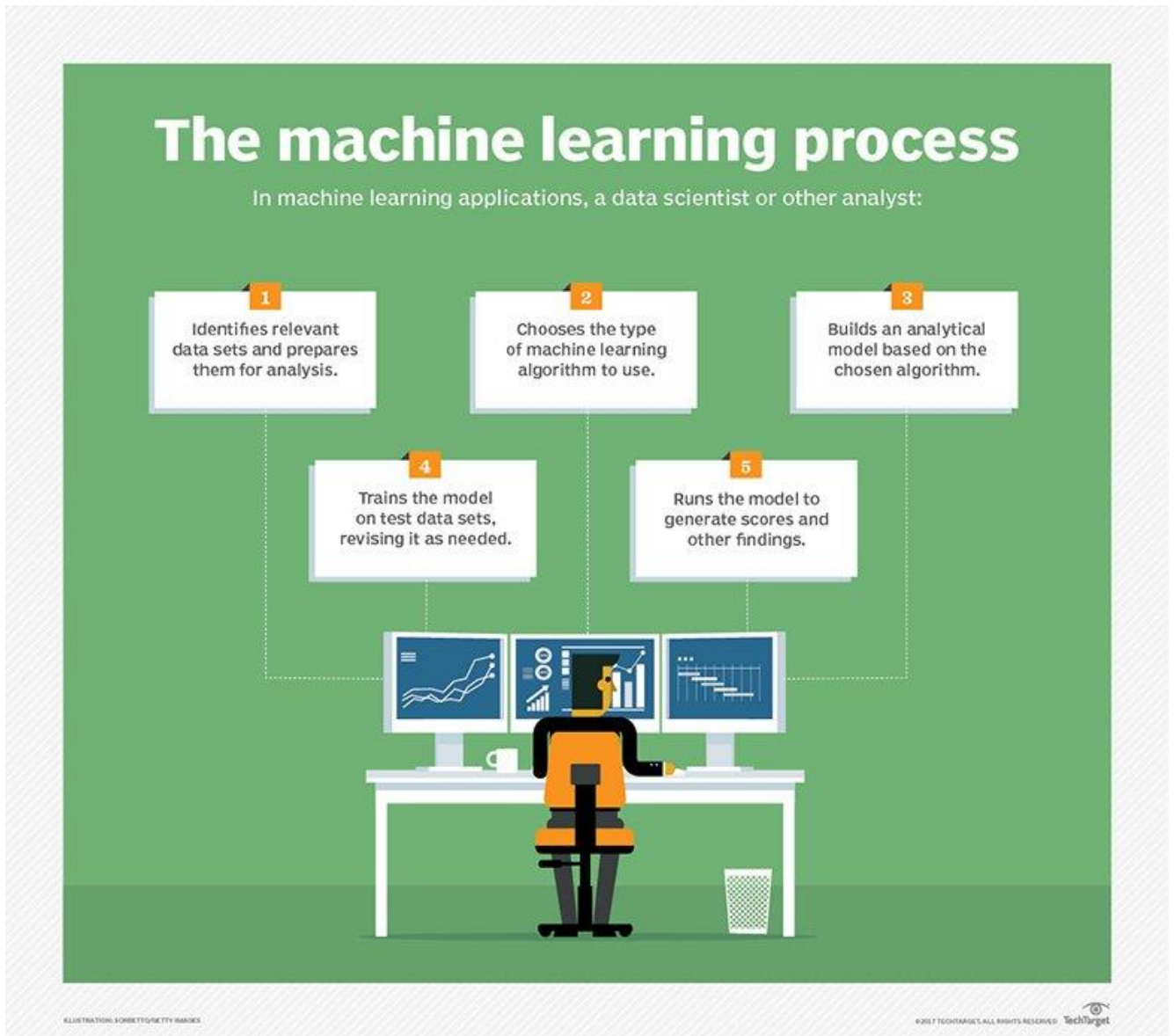
FIGURE 1. The machine learning process (Rouse 2019)

AI is being utilized in a wide scope of uses today. A standout amongst the most notable precedents is Facebook's News Feed. The News Feed utilizes AI to customize every part's channel. If a user frequently quits looking to peruse or like a specific companion's posts, the News Feed will begin to demonstrate a greater amount of that companion's movement prior in the channel. In the background, the product is basically utilizing measurable examination and prescient investigation to distinguish designs in the client's information and utilize those examples to populate the News Feed. If the user never again stops to read, or remark on the companion's posts, that new information will be incorporated into the informational index and the News Feed will modify in like manner. (Rouse 2019)

AI is likewise entering a variety of big business applications. Customer relationship management (CRM) frameworks use learning models to break down email and brief deals colleagues to react to the most significant messages first. Further developed frameworks can even suggest possibly successful reactions. Business Intelligence (BI) and investigation merchants use AI in their product to help clients consequently distinguish possibly significant information focuses. Human resources (HR) frameworks use learning models to distinguish attributes of powerful representatives and depend on this information to locate the best candidates for open positions. AI likewise assumes a significant job in self-driving autos. Profound learning neural systems are utilized to distinguish obstacles and decide ideal activities for securely controlling a vehicle on the road. (Rouse 2019)

Machine learning is associate degree application of computing (AI) that gives systems the power to mechanically learn and improve from expertise while not being expressly programmed. Machine learning focuses on the event of pc programs that may access knowledge and use it learn for themselves. The process of learning begins with observations or knowledge, like examples, direct expertise, or instruction, so as to seem for patterns in knowledge and create higher selections within the future supported the examples that we offer. the first aim is to permit the computers learn mechanically while not human intervention or help and modify actions consequently. Machine learning algorithms are usually classified as supervised or unsupervised. (Varone, Mayer & Melagari 2019)

Supervised machine learning algorithms will apply what has been learned within the past to new knowledge victimization labeled examples to predict future events. ranging from the analysis of a proverbial coaching dataset, the training algorithmic program produces associate degree inferred perform to form predictions concerning the output values. The system is in a position to produce targets for any new input when enough coaching. the training algorithmic program can even compare its output with the right, meant output and notice errors so as to switch the model consequently.

In distinction, unsupervised machine learning algorithms are used once the data accustomed train is neither classified nor labeled. unsupervised learning studies however systems will infer a perform to explain a hidden structure from untagged knowledge. The system doesn't understand the proper

output, however it explores the info and may draw inferences from datasets to explain hidden structures from untagged data.

Semi-supervised machine learning algorithms fall somewhere in between supervised and unsupervised learning, since they use each labeled and untagged knowledge for coaching – usually a little quantity of labeled data and an oversized amount of unlabeled data. The systems that use this methodology are ready to significantly improve learning accuracy. Usually, semi-supervised learning is chosen once the noninheritable labeled knowledge needs virtuoso and relevant resources so as to coach it / learn from it. Otherwise, acquiring unlabeled knowledge usually doesn't need further resources.

Reinforcement machine learning algorithms could be a learning methodology that interacts with its surroundings by manufacturing actions and discovers errors or rewards. Trial and error search and delayed reward are the foremost relevant characteristics of reinforcement learning. This methodology permits machines and computer code agents to mechanically confirm the best behavior among a selected context so as to maximize its performance. straightforward reward feedback is needed for the agent to be told that action is best; this can be called the reinforcement signal.

Machine learning permits analysis of large quantities of knowledge. whereas it usually delivers quicker, a lot of correct leads to order to spot profitable opportunities or dangerous risks, it's going to conjointly need beyond regular time and resources to coach it properly. Combining machine learning with AI and psychological feature technologies will create it even simpler in process giant volumes of data.

2.3 The definition of Deep learning

However, Deep learning is something more complicate than Machine learning. Deep learning is the next level of Machine learning or a subset of Machine learning. Based on database from Machine learning, Deep learning then will decide what to do with those data, especially predicting the future (Marr 2016). Again, Deep learning is an upgrade version of Machine learning with Deep Neural

network, where you can see a computer system is not only classify data into deference group but also making decision on what to do with them or predict the future from those datasets. Deep Neural network can deal with large size of data such as Facebook's post/comment or Google's image library. Deep learning and deep neural network existed because of specific intelligent tasks where normal neural network cannot complete. Those tasks need more works on classifying, analyzing, comparing data in datasets also in new input data updated overtime in order to make decision or come to a prediction or forecast.

The reason why I mentioned Deep learning and Machine learning is it is the basic knowledge you need to know to understand how smart people use AI and become better and richer than other. For example, have you ever wondered how Facebook know what you want to know or want to see at the moment by giving lots of ads while you are surfing your Facebook or watching a video? Have you ever wondered anytime you search something on Google, where is your result come from? How about give it a try by compare results of you and your friend when search the same thing at the same time on Google? You will be surprise because of the difference. Have you ever asking why? Or in any spying movie, have you ever thought about what kind of technology they use to find suspect car or the shortest way to get to the mission destination? The answer is Deep Neural network and its application.

Neural networks are a group of algorithms, sculptured loosely once the human brain, that are designed to acknowledge patterns. They interpret sensory knowledge through a sort of machine perception, labeling or clump raw input. The patterns they acknowledge are numerical, contained in vectors, into that all real-world knowledge, be it pictures, sound, text or statistic, should be translated.

Neural networks can be considered on **cluster** and **classify**. you'll be able to think about them as a cluster and classification layer on prime of the info you store and manage. they assist to cluster unlabeled knowledge consistent with similarities among the instance inputs, and that they classify knowledge after they have a tagged dataset to coach on. (Neural networks can even extract options that are fed to different algorithms for clump and classification; so you'll be able to think about deep neural networks as parts of larger machine-learning applications involving algorithms for reinforcement learning, classification and regression.) (Marr 2018)

All classification tasks rely upon tagged datasets; that's, humans should transfer their information to the knowledge set so as for a neural network to be told the correlation between labels and data. this is often referred to as supervised learning.

- Find faces, establish individuals in pictures, acknowledge facial expressions (angry, joyful)
- Establish objects in pictures (stop signs, pedestrians, lane markers…)
- Acknowledge gestures in video
- Find voices, establish speakers, transcribe speech to text, acknowledge sentiment in voices
- Classify text as spam (in emails), or deceitful (in insurance claims); acknowledge sentiment in text (customer feedback)

Any labels that humans will generate, any outcomes that you just care regarding and that correlate to knowledge, may be wont to train a neural network.

Clustering or grouping is that the detection of similarities. Deep learning doesn't need labels to find similarities. Learning while not labels is termed unattended learning. unlabelled data is that the majority of information within the world. One law of machine learning is: the additional knowledge associate degree algorithmic rule will train on, the additional correct it'll be. Therefore, unattended learning has the potential to supply extremely correct models.

- Search: scrutiny documents, pictures or sounds to surface similar things.
- Anomaly detection: The flipside of sleuthing similarities is detecting anomalies, or uncommon behavior. In several cases, uncommon behavior correlates extremely with stuff you wish to find and forestall, like fraud.

Neural network also can be considered as human brain. You can imagine that neural network works based on the link between datasets on their storage and new data receiving from outside environment. From the link of 2 difference kinds of data, neural network can give some advises, make decision or predict the future by compare and contrast them in the past and present. All I can say for now is what neural network look like, if you want to know more, I cannot help you because the way to create a neural network can be considered as top secret of any organization in the world. Why? Because it is their weapon to overcome their competitor.

Deep learning is a man-made intelligence perform that imitates the workings of the human brain in process information and making patterns to be used in deciding. Deep learning may be a set of machine learning in AI (AI) that has networks capable of learning unsupervised from information that's unstructured or unlabeled. conjointly referred to as deep neural learning or deep neural network.

Deep learning has evolved hand-in-hand with the digital era, that has caused AN explosion of information all told forms and from each region of the planet. This data, noted merely as huge information, is drawn from sources like social media, net search engines, e-commerce platforms, and on-line cinemas, among others. This huge quantity of information is quickly accessible and might be shared through fintech applications like cloud computing. (Marr 2018)

However, the data, that unremarkably is unstructured, is therefore Brobdingnagian that it may take decades for humans to understand it and extract relevant data. corporations notice the unbelievable potential which will result from unraveling this wealth of data and are progressively adapting to AI systems for machine-driven support. We're during a time once machines will learn to unravel complicated issues while not human intervention, what specifically are the issues they're tackling? Here are simply a couple of of the tasks that deep learning supports nowadays and also the list can just still grow because the algorithms continue to learn via the infusion of knowledge.

Virtual assistants

Whether it's Alexa or Siri or Cortana, the virtual assistants of on-line service suppliers use deep learning to assist perceive your speech and also the language humans use after they act with them.

Translations

In a similar means, deep learning algorithms will mechanically translate between languages. this may be powerful for travelers, business folks and people in government.

Vision for driverless delivery trucks, drones and autonomous cars

The means associate autonomous vehicle understands the realities of the road and the way to reply to them whether or not it's a stop sign, a ball within the street or another vehicle is thru deep learning algorithms. The additional knowledge the algorithms receive, the higher they're able to act human-like in their info processing—knowing a stop sign lined with snow continues to be a stop sign.

Chatbots and repair bots

Chatbots and repair bots that give client service for a great deal of corporations are able to respond in associate intelligent and useful thanks to an increasing quantity of exteroception and text queries due to deep learning.

Image colorization

Transforming black-and-white pictures into color was erst a task done meticulously by human hand. Today, deep learning algorithms are able to use the context and objects within the pictures to paint them to essentially recreate the black-and-white image in color. The results are spectacular and correct.

Identity verification

Deep learning is being employed for identity verification not just for security functions except for tagging folks on Facebook posts and that we can be able to procure things in a very store simply by victimization our faces within the close to future. The challenges for deep-learning algorithms for identity verification is knowing it's an equivalent person even after they have modified hairstyles, grownup or shaven off a beard or if the image taken is poor because of dangerous lighting or associate obstruction.

Drugs and prescribed drugs

From illness associated tumour diagnoses to customized medicines created specifically for an individual's ordination, deep learning within the medical field has the eye of the many of the most important pharmaceutical and medical corporations.

Customized looking and amusement

Ever marvel however Netflix comes up with suggestions for what you must watch next? Or wherever Amazon comes up with concepts for what you should obtain next and people suggestions are specifically what you wish however simply ne'er knew it before? Yep, it's deep-learning algorithms at work (Marr 2018)

2.4 AI as a challenger to mankind

Mankind is always proud of themselves as the most intelligent species on earth. In any kind of environment, human is always finding a way to survive no matter what happen. In the war of territories between all kinds of species throughout the history of the planet Earth, mankind is the winner. We defeated all other species by our ability to learn and improve ourselves. Human become smarter by learning the strength and weakness of enemy, become stronger by training our biological body after each war. The ability to think and react also the ability to control our biological body makes us become invincible on Earth.

However, human also has a weakness. We have a hole right in the middle of our chest. It is just a tiny hole but cannot be fulfill by anything. We always want more, everything is never enough. And that weakness leads us to the most powerful enemy of mankind, AI. Consider 2 weapons that makes mankind became the king of Earth, ability to learn-improve and controlled biological body and figure out why AI can defeat the King of Earth.

"Ability to learn-improve", let me remind you about one thing I have told you before, Weak AI, a machine has the ability to solve some specific problems as human. In 2015, Google introduced a program named Alpha Go, a computer program can play Go (Japanese chess) (The story of Alphago so far.). As we all know, Go is a thousand times harder than chess. Alpha Go, a computer program, made everyone surprised by defeating the world champion 5 times. But that is not the end of the story, the missing part which not so many people know about, the part which I believed that will make all of you, even I feel cold is one year later, Google continued to initiate another computer program that has the same function as Alpha Go, named Alpha Go Zero (Hassabis. Silver. 2017). Alpha Go Zero achieved a goal that no one can imagine is defeat Alpha Go with an unbelievable score: 100 to 0, 100 wins in a row. Alpha Go Zero is just an example of Weak AI. Think about an example of Strong AI (AGI) and tell me how you feel about the future.

AlphaGo and AlphaGo Zero is just an example. If you can take a wider look at the big picture, I can give you an old term "neural network. You can consider neural network is the mother and AlphaGo and AlphaGo Zero is her sons. Neural network can overcome normal human brain because it has huge

storage of data, it will never forget anything, it can be accessed to use at any time. All I can say is Neural network is a upgrade version of human brain.

"Controlled biological body" A machine does not feel tired, human does. It does not need any break or day off, 24/7 working, human needs the weekend or at least a few weeks in a year for all kind of holiday. It does not need to eat, sleep or a few mins in restroom, human does. Weather is not a problem for a machine but for human, it is. It cannot get sick, human can. Human needs at least 2 different gender adults and 9 months to make another human, normally one more, but a machine just needs a few hours to make 1000 other versions with 100% same quality with the original. You and I; how about take a sit and imagine how to make friend with machine? It will be a smart move than let them consider us as an enemy.

3 THE WAY ARTIFICIAL INTELLIGENCE AND AUTOMATION CHANGE THE WORKFORCE IN THE FUTURE

Let me remind you a little bit about what we have done so far. AI is the best among the best in mankind's inventions. Every problem has both good and bad side as 2 sides of a coin. For example, with understanding of nuclear physics, the American made 2 nuclear bombs and considered Hiroshima and Nagasaki as their practice yard to see how it work. On the other hand, still nuclear physics, Japan used it as a power source to light up every corner across the country. There will be the same understanding with the invention of AI, good and bad side with a small different. Nuclear physics cannot do anything without human's hand. It cannot play by itself, but AI can. AI really does not need our helps. It can learn and play by itself. Therefore, whether good or bad, we can control almost every aspects of nuclear physics but that is not going to happen with AI.

Let put aside our small talk about nuclear physics and AI, we still have some time until   then. Whether AI is good or bad, model sciences are still working on it, and they are already achieved something. The point is their achievements might impact your meal, I mean anyone who are looking for a job or already had a job. Because you might have a chance to be retired sooner than you think because of those achievements. However, there are still good side and bad side as usual. Also, I will give some advises according to what I have in my mind after hours and hours doing research about how to deal with those achievement.

3.1 Decrease jobs

I was born in 1994, when the world begun to change by technology achievements. At that time, the biggest achievement of technology was automation. Human started using automation around 1950s. The automation concept was used in mass production few years later, firstly was in car manufacturing then expanded to almost every industry. At the time automation was born, worker in factory lost their job. Now with the participation of AI, the factory in the future will be one human who make sure all machines are working normally and a dog who be there just to make that human does not feel lonely. The factory had fewer and fewer workers than before but can make more products in a shorter amount

of time. Next, the cow lost its place in the field, and the farmer. Cow and farmer will very soon lose their place on the field when machines can do faster and more accurate at almost every task in the process from seeding to harvesting. Basically, the future of agriculture will not depend on the weather anymore.

Go over time to 1990s after automation was something obvious in production, internet was born, then computer and wireless communication product. Internet became something cannot replace in working life and everyday life. They used computer as a magical tool which can do mostly everything from recording, writing and sending things from 1 place to another place all around the world. At that time, internet and computer changed the way people communicate. Letter and postman were replaced by e-mail. Recorder in handwriting lost their job because people had their own computer.

We left 1990s and go to nowadays. The world of paperless; Based on the internet, people with computer and mobile phone (a wireless communication product) can do almost everything by themselves. Internet has the same meaning with Free Information, which means we are very close to the last days of tradition publisher. Publisher will lose their job because people can read mostly everything through their screen. Do you remember the last time you actually read news in a newspaper? Salesman and telemarketer will share the same fate with publisher because of online shopping. You can find almost everything on eBay.com, Amazon.com or Alibaba.com. Photographer and editor should look for a new job because there are lots of software on computer and application on mobile which helped user make their own beautiful memories by themselves like camera 360. When is the last time you go to a travel agency and listen to their recommendation about your Independent holiday trip? Many thanks to Booking.com, Airbnb and TripAdvisor; it will be a memorable trip.

We were saying goodbye to the farmer, and now it's time for you to say everything you want your friend who works in warehouse know because they might not need to go back tomorrow. That is what happened with workers in an Alibaba's warehouse in Huiyang, China (Tracy 2017). There are only 60 robots working in a 3000 square meters. It happened few years ago and already stunned the logistics world. These wifi-prepared, self-charging machines are in charge of moving products in the distribution center. They send the goods to human specialists, who at that point organize the items to
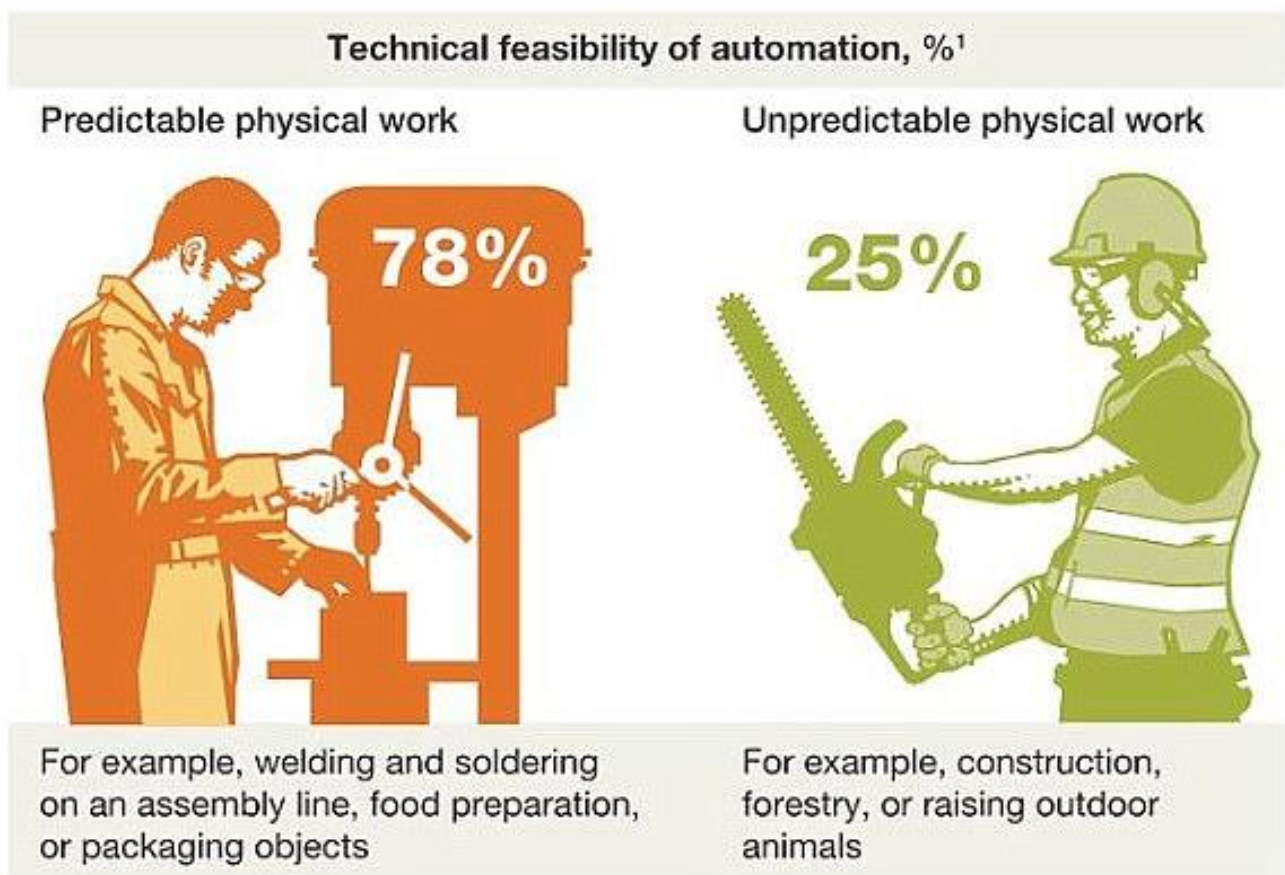
be pressed and presented on clients around the globe. The machine has been named Zhu Que, or the Vermilion Bird, which is a soul animal in the Chinese folklore.

The robots get guidelines by means of Wifi signals. They would then discover the merchandise and move them to the assigned drop-off focuses for human specialists to get. Every one of the machines is fitted with laser identification which keeps them from bumping into each other. Once completely charges, the robot could work eight hours constant. Zhu Que can head out up to 1.5 meters (five feet) every second and convey a heap as overwhelming as 600kg (1,322 pounds). Quicktron said the robots have saved laborers from going around the stockroom to discover merchandise. Customarily, a laborer could sort 1,500 items during a 7.5-hour move in the wake of making 27,924 steps; with the assistance of Zhu Que, a similar specialist could sort 3,000 items amid a similar timeframe and just 2,563 steps should be taken.'The robots need to collaborate with each other and work independently at the same time. They represent the highest level of China's warehouse robots,' said Cainiao Logistics, an Alibaba branch that manages the warehouse. You Yuquan, a coordinations master from Cai Niao, said the robots could lift and pivot the racks, which makes it simpler for human laborers to achieve the merchandise. Mr. You likewise said that the organization could store merchandise along the majority of the four sides of the racks, which expands the accessible extra room.

As indicated by Quicktron, the stockroom will enroll another 40 of these conveyance robots. Thanks to new generation worker, at least 70% of people who used to work in all Alibaba's warehouse lost their meal. Imagine what will happen in 2020, the number will not stop at 70%, maybe at 100%. If we think about the future, we should consider carefully about AI. Based on the achievements which human had about AI and the limitless potential in the future, AI can do and achieve what human cannot, and it can do better than what we are doing. Any job in the field of managing, processing and producing data will be cut down to minimum scale because AI can work with data much better than human. Anyone who works in accounting, administrating should look for a new job. However, AI will displace salesman in KFC or Berger king and cashier in supermarket because one computer program can do all those tasks in much shorter amount of time. Even teacher might lose their job when parent and children have the chance to choose and get knowledge which is needed for children's future via online courses which called online education (Ray 2017) or E-learning, all by themselves.

For example, in order to tracking suspect's car are running away from the police, the cameras on the road first have to receive all kind of data from the road such as color of car, size, model, shape, engine sound… then based on datasets in the system of police, the computer can compare those data then decide which car is the correct one. A computer with deep learning technology can easily complete those tasks in 1 second. However, in the navigation of self-driving car, based on sensors and onboard analytics, that car can recognize obstacles on the road and quickly react by using deep learning technology.

FIGURE 2. The different between predictable and unpredictable work (Chui, Manyika & Miremadi 2016)

From the article "Where machines could replace humans- and where they can't) (yet), I had come to conclusion with some figures which might help you out in choosing jobs in the future:

- 59% of manufacturing activities could be automated. Within this field, the researchers say 90 % of the activities of welders, cutters, soldiers could be done by a robot.
- 73% of activities in food service and accommodations could be automated
- 53% of retail work could be automated;
- 47% of the salesperson's job could be automated,
- 86% of bookkeepers, accountant and auditing clerks has this potential

Basically, at least 78% of predictable physical activities will be replaced by automation. However, those jobs in education, healthcare or "knowledge work" such as management jobs will remain low potential of automation replacement.

3.2 Increase jobs

There is a rule, in my opinion; it might be true from time to time. If we think people are going to lose their job when technology jumped in; it just the changing of jobs in general, not losing. Looking back to 1950s when the automation was born and used in manufacturing, people who worked as workers lost their job in the factory, but the number of cars were produced and sold increasing significantly, follow up were the increasing in demand of people who can sell car and take care of car. As you can see, people won't lose their money; they just had to earn it in another way.

In the time of internet and computer, postman and old-model recorder had the same fate as worker in the factory 50 years ago. Otherwise, anyone who knows how to work with computer and internet always has a position in any organization. The problem here was the same in the time of automation; people need to change themselves to make money. This time was also the beginning of some famous names in technology industry which we all know nowadays such as Google in 1997 and Facebook in 2004.

In the next 20 years, people might lose around 47% of chance to apply for a job because those slots will be filled by machine (Stark 2017). The rule of changing jobs was true in the past then it might work the future too. We all know the future of AI is unpredictable and its growing potential is limitless. Thus, what we can do and should do to keep our every meal? Until now, no one can give an exactly answer for that question.

3.3 Future solution

The answer for the question is not simple, and there will be no direct and solid plan to deal with. There are always two options for a person when he/she has to deal with a new challenge, be the first and get all the golden assets or be the next and get what people left behind. The changing speed of AI is unpredictable, not like automation or computer. Nowadays, people like you and me who are taking our first step to a brand-new place; we are very close to weak AI which is software and program on technology product (Henry 2015). In this field of AI, we are followers, not the first. What we can do from now is tracking what leader organization in this field do, what they need us to do as a helper; then prepare ourselves whenever they need, that would be a solution for us. Even though, there are lots of opportunities for us to examine in the field of Weak AI, its application in servicing would be a good start.

The option of being a follower as I listed above has lower benefits than the option of being a pioneer but safer. When anyone considers themselves as a first man, the place where they must get in would be Strong AI. There are some big names in technology industry already marked their step in the field of Strong AI like autopilot program of Tesla or Deep Learning in Google Search Engine of Google which we will examine later. Those are wonderful achievements and it is only the surface of Strong AI. Imagine what human can do further with Strong AI, it is a world of unlimited potentials.

Put aside a guesses or prediction, there is one thing I know for sure; with the help of AI, worker and officer can finish their work sooner, which means there will be more time to spend with their wife and kid. Then they might need to find something to do to fulfill the extra time they get thanks to machine; that is the golden time for entertainment industry. Movie Theater, music concert, comedian show,

museum, all kind of art which can entertain people; how about being a dancer? However, be prepare to train your mind to be as creative as possible, you should go to work with lots of critical thinking in your pocket because that is a world without rules or any kind of regulation; in the past, you need to be creative to get rich, now you need it to fulfill your empty stomach. In a world of any types of work can be or must be done by following a certain rule as the world we are living now, there is no way you can beat AI, no matter how smart you are or how fast you can be.

3.4 Amazon Go as an example

All the great invention the world came from the idleness of human. When people feel tired of walking, they created vehicle. When a man gets tired of opening a door for a woman every time he walks in or out a place, he invented revolving door. Then one day, after hours of waiting to check out in a supermarket, they get tired of those things, what happened next is the birth of Amazon go. Have you ever though that one day you can go to a store, grab things that you want then went home? It's just like you got a permission to rob a store without getting caught. Amazon.com Inc are the first organization which makes it come true.

3.4.1 The concept of Amazon Go

The Amazon Go store was built based on Just Walk Out Shopping experience "No lines, no checkout". It covers all the steps in your shopping process from the moment you walk into the store until you bring your things walk out the store. Amazon makes shopping process become very simple by using the newest technology in the world to create what they called Just Walk Out Shopping experience. As I said above, the application of AI in service is still a deserted place and Amazon just marked their footprint on that land.

To make it easier to understand, I divide our trading process into 2 steps: people versus people and people versus machine. We have been trading with other in many ways but basically, a trade happened between a seller and a buyer as 2 guys face to face from the bronze age, nothing has changed. Amazon

go is something else. A trade now can happen between you can a "unknown" machine. I believe after you understand, you may like it as I do.

Before you walk into the Amazon Go store, you need to use the Amazon Go app. It is like a magical hand which will get your money out of your pocket when you done your shopping. You will wonder how they know what you grab to calculate, the answer is computer vision, sensor fusion and deep learning. I will explain it in later chapter but all you need to know is with the help of AI, the move of product from the moment it is being taken out of its place in shelf until it gets out of the store will be tracked. The moment you walk out with Amazon Go's product, computer will calculate, get money from your Amazon account, then send you a receipt.

3.4.2 Its impact on Jobs

Basically, the dream job as a cashier in amazon store is gone. Lucky for us, there is only one Amazon Go store in the world now. No one knows the future, but it will come faster than you expect. When technology came to a store, it wiped out one of the most important position, cashier. The whole shopping process is from inputting product to the store until the product was paid and carried out of the store and the use of AI are only in the last part of the process. Let take short break here and have a meal at McDonald. Wait a minute, I am looking for a beautiful girl who stands behind the bar and give me a gorgeous smile every time I walk in and order my burger, where is she? Am I talking with a machine to get my burger?

Let make a simple calculation. There are more than 37.000 McDonald store around the world (Wikipedia) with at least 3 cashiers each store (under my knowledge) will be equal 111.000 cashiers all around the world. With the invasion of machine, there will be thousands of walkers on the street looking for something to do. Even though, there are still rooms for human. However, with the development speed of AI, there will be no room for human working directly with the product in or out the store. In the other hand, the disappearing of cashier will be a notification of a new kind of job. When the computer controls the store, there will be a man who controls the computer.

3.5 Self-Driving technology

10 years ago, if I told you one day you will see a car can move by itself, without anyone holds hands on steering wheel, you will give me a knock in my head 'Wake up, dude. Stop watching those stupid science fiction movie' whatever you want to believe, right now, turn on your Chrome and Google one of these words: Uber self-driving car or Tesla self-driving car, you will know that I am not crazy, not at all. Tesla and Uber are 2 companies leading the 4th industrial revolution in urban transportation. They are already put that kind of science fiction crap into practice and stun the world just few years ago. If you don't want to spend hours and hours searching and reading what they have done, I suggest you can take a few minutes to read mine document. It might be not enough but at least will help you clear your head before going deeper.

3.5.1 What they have done in Self-driving technology

You can order a Model S of Tesla car right away if you really want to know what the future of transportation is and how close they are in Tesla.com. Take a close look at Autopilot program; that is what they named for this technology (Autopilot, Tesla). Unfortunately, the Autopilot program of Tesla for now can only reach to a level of Self-driving technology as a driving-assistant, but they are very close to a future where you will not need to do anything, just fasten your seatbelt, speak where you want to go then relax. However, what that program can assist you is more than enough. For example, it can help you change lane in the highway, automatically move your car to avoid potential collisions from another car or fit your speed with traffic. Imagine you can summon your car like a pet, how cool is that? Your wife used to spend 15 minutes to park her car, now you have a chance to speed it up 15 times with just a single touch. 'Shut up and take my money' is what you are going to speak with tesla's salesman before ordering a Tesla model S car.

Say goodbye to Tesla, we will visit Uber and see what they have done. When tesla named their self-driving technology as Autopilot, Uber picked the name Uber's Advanced Technologies Center (Molly. 2016). The Advanced Technologies Center (ATC) co-op with the car to collect mapping data also testing self-driving program. ATC included variety of sensors such as radar, laser scanner and high-resolution cameras to visualize the traffic environment. Even though the ATC are still being tested but

no one can deny what they can achieve with the assistant of AI. There is not too far till the day they can show us self-driving car is not a science fiction crap.

3.5.2 Its impact on job

Let take US as an example. There are 3.5 million truck drivers in USA (The Schneider Guy. 2018). Remember what I mentioned above about self-driving technology, do you think how long does it take to make millions of drivers lose their job? Moreover, 3.5 million is only the number of truck driver, not included cab-driver. This kind of technology are threating millions of people and remember, it is just one small achievement of AI. Let me give you a vision of future, no driver which means no one will stop at gas station to have a burger and a coke, which means no cashier and no waitress, no one. Even this technology impacts mainly on only one field of labor force, driver but one way or another, other guys will get hurt.

4 CONCLUSION

According to what I know and believe, AI will lead the next revolution in mankind history and this time is not like any other. This time, our 1st position on the food chain will be challenge, but that is what might happen in 2050 or later. For now, in the next 5-10 years, there is one thing I know for sure, the rate of unemployment will increase, so the sooner we know, the better we can react.

In the other hand, there were some advices from experts on how to deal with the change. I am not sure it will benefit for you or not but for me, I will listen to what they said very carefully. Because whether you like it or not, AI are on the way and I can guarantee with you that it will not stop, at least not because of all mankind say so or want to do so. Mankind, throughout the history, had lots of chance working with Smart people like Albert Einstein or Stephen Hawking with IQ over 150. The table has turned, mankind very soon has to deal with a machine has an IQ level of 1000. Who have the right to talk? Guess what, not us, for sure.

The answer which I can give you is AI will not take all your money, so don't be too pessimistic about the future. However, you and I, we need to consider very carefully what mankind can do with AI. It is always about the changing, the old gives place for the new. We must change ourselves as soon as possible to be in the best position, waiting for AI to come. I cannot say exactly what you must learn or how we get prepare because no one can because human don't even fully understand what they can do with AI. However, prepare yourselves with basic knowledge about AI, up to date what is happening with AI right now as soon as possible might be a good plant. As I said above, we can beat AI in the world being built by rules and regulation, so be creative. Critical thinking is needed more than ever. The sooner we know, the better we do. Good luck to all.

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