

Role of Artificial Intelligence in approaching Future Formation: A case study

Samriddhi Tiwari

Shri Shankaracharya Institute of Professional Management and Technology

Abstract

This paper will look at the various aspects of Artificial Intelligence and offer cessation plans for analyzing them and gives us a brief note on how close are we getting to achieve AI. It will propose a variety of tools for investigating, adjudicating and enlightening the estimates made by the experts. Focusing specifically on the section on how machines can perform as similar tasks as humans, and how fast machines can reach and achieve the human intelligence. I wanted to clarify what the distribution of ideas actually is, what probability the best experts presently allocate to high-level machine intelligence approaching up within an exact time-frame, which jeopardies they see with the progress and how reckless they these emerging. High-level machine intelligence will be technologically advanced around 2040-2050, mounting to a nine in ten chances by 2075. Experts assume that systems will move on to superintelligence in fewer than 30 years.

Keywords: Intellect, Deep Learning, Supercomputers, Narrow, time-frame.

1. Introduction

AI is a part of our everyday lives. It is here and amongst us every day. In fact, most people carry it around in their pockets. Yes! It is vividly popular as cell phone. How much smarter have people become with their cell phone? For instance; ask anyone how much 30 pounds is in kilograms? Voice search: Hey Siri! How much is 30 pounds in kilograms? And there you go, the answer to almost everything is in the palm of everyone's hand.

In the world of computer science, the term "Artificial Intelligence" is referred to any human like task performed by a computer, robot or any other machine. AI states to the capability of a computer or a machine to execute human tasks- recognizing objects, decision making, problem solving- and have the capability to combine these tasks and perform a single function a human can fulfill, such as cleaning the house, driving a car. Machines are widely used using cross-disciplinary approach based on mathematics, computer science, logistics, psychology and many more.

In this paper, I kick off by proposing 'The Road to Intelligence', what types of AI calibers are there and how the world is dependent on them. Different researches and estimates can effect in very unlike acts., it will be the ultimate aim of this project, to categorize and examine their consistency.

Prepared with this outline, I have investigated some of the methods from the hypothetical outlook. The aim of this paper is not merely to review method or persons, but to construct a tool chest of valuation tools that will both allow us to guess the consistency of AI, and let us to briefly comprehend what the future of AI holds for us.

This paper, the initial scheme, looks precisely at the path to achieve AGI (a less ambiguous modern term), and how AGI can bring a dynamic change in the future. With the help of prejudices works, I have demonstrated that there are strong explanations to professional of 'how' and 'when', we can reach there. In the second part of the project, I have laid down my research to suitable methods that can prove to give a better result in order to help us getting closer at even rapid rate.

With this data, I further investigated the evolution of AI algorithms, starting off from 1950's till present. This enabled me to show that there seems to be very much time left when the world will see the real power of AI.

2. The Road to Superintelligence

This section covers relevant facts about different types of AI, since AI is a wide perception, the serious groupings we need to reflect about are based on AI's caliber. There are three major AI caliber categories:

Caliber 1: - Artificial Narrow Intelligence (ANI)

Frequently stated to as weak AI, ANI is a type of Artificial Intelligence that is fixated and skilled to achieve precise errands. Weak AI drives most of the AI that surrounds us today. 'Narrow' is a more accurate descriptor for this type of AI, because it is anything that is weak; it permits some remarkable applications, counting Apple's Siri, Amazon's Alexa, self-driving cars etc.

Caliber 2: - Artificial General Intelligence (AGI)

AGI is a kind of AI which entirely replicates the self-sufficiency of human brain- AI that can resolve several types or classes of problems and even indicate the problems it desires to resolve without human intrusion. Strong AI is still completely hypothetical, with no real-world instances as of today.

Caliber 3: - Artificial Super Intelligence (ASI)

ASI is greater to human intelligence or capability. An instance of ASI might be HAL, the phenomenal computer assistant in 2001: A Space Odyssey.

2.1 A World running on ANI

ANI is machine-intelligence that equals or surpasses human intelligence or proficiency at explicit things. Few illustrations are:

1. Google search is one huge ANI brain with unbelievably classy approaches for positioning pages and guessing out what to display in particular. Some goes for Facebook's feed too.
2. When the plane lands, a human doesn't elect which gate it should go to. Just like it is not a human determined the value of ticket.
3. Cars are occupied of ANI systems, from the computer that figures out when the anti-lock brakes should kick in to the computer that tunes the limit of fuel inoculation systems. Google's self-driving car, which is being verified now, will comprise robust ANI system that permits it to distinguish and respond to the world around it.
4. The cell phone's we use is a diminutive ANI factory. When we direct using the map app, talk to Siri, check today's weather, or dozens of everyday activities, we are using ANI.

ANI doesn't have the capability to cause an experiential danger. Each new ANI modernization gently adds extra block onto the road of AGI or ASI.

2.2 The Road from ANI to AGI

Why the path from ANI to AGI is tough? Exponential progress in computational influence and constant research in Brain Computer Interface could fuel expansion of AGI surprisingly. The research community trusts that existing models for getting to AGI comprise the AI getting by self-enhancement. These measured leaps could help it ascend in intelligence and even grasp super intelligent level shortly. According to futuristic Ray Kurzweil, AI is just around the corner and we are on a firm walk towards singularity.

2.3 Road from AGI to ASI

At some point we all have attained AGI- computers with human-level general intelligence. But according to my research the answer is NO. As we still can't deny the fact that AGI within an undistinguishable level of intellect and computational capacity as a human would still have substantial compensations over humans. AI, which will likely get to AGI being programmed to self-improve, wouldn't see "human-level intelligence"- it is only an appropriate indicator from my opinion - and wouldn't have any aim to 'stop' at our equal level. It is pretty obvious that having the equivalency to human intelligence, AGI would only triumph for a brief instant formerly running headlong to the land of superior-to-human-intelligence.

To know more about the about the topic, I researched more, and it will shock us when AGI will be able to match ASI. The reason is from the perspective; A). While the intelligence of unlike varieties of animal varies, the main characteristic we're conscious of about any animal's intellect is that it is far lesser than ours B). We view the keenest humans as way keener than the dumbest human. To make it vibrant, I've clarified it through figure 1.

Our Distorted View of Intelligence

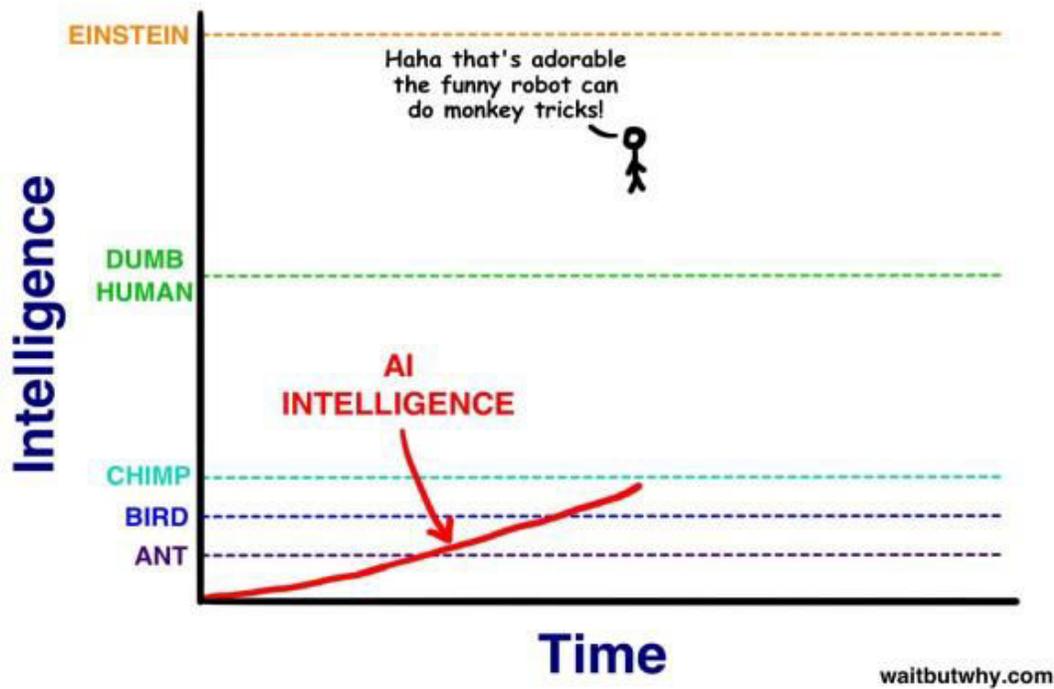


Figure 1: - Our distorted view of intelligence.

As AI rises up in intelligence towards us, we'll see it as merely becoming keener, for an animal. Then, when it triumphs the lowermost measurements of humankind- Nick Bostrom uses the term "the village idiot"- we'll be like "Oh wow, it's a dumb human. Delightful!". The one entity is, in majestic hue round of intelligence, all humans, from the town idiot to Einstein, are within a very slight choice- so just after striking town idiot level and being acknowledged to be AGI, it will be swiftly keener than Einstein and we don't know what happens next?

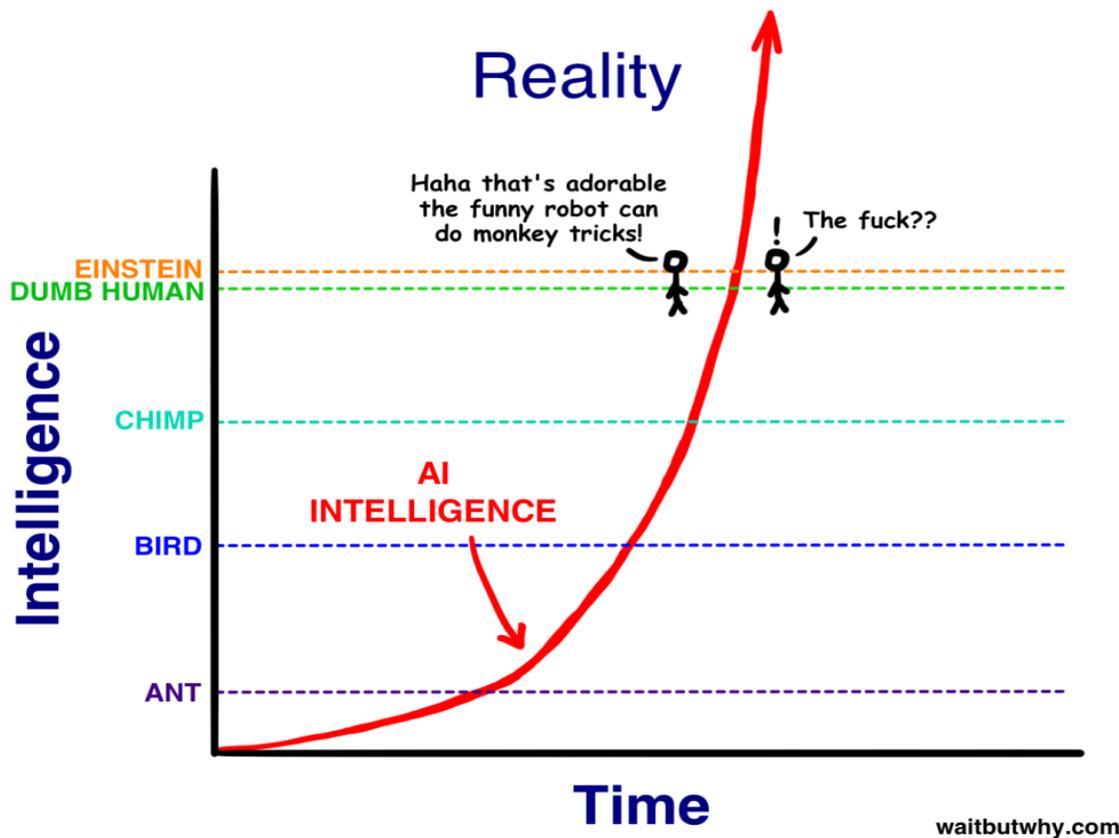


Figure 2: - The reality when animals will be way smarter than the humans.

3. Methodology

In this field, I have narrowed down my research to how to create a strong AGI with some prior works and research and how AGI could become a part of our life.

3.1 First Key to create AGI: Increasing Computational Power

One thing that is obligatory to occur AGI is an growth in the control of brain. One technique to express the calculating measurements is the overall circulations per seconds(cps), the brain could accomplish, by guessing out the maximum cps of each construction in the brain and totaling them all together. Ray Kurzweil came up with a cutoff by taking someone’s specialized evaluation for cps of one construction and that construction’s mass associated to that of the entire brain and then multiplying equivalently to get an estimation for the whole. He did for a group of periods with numerous professional approximations, and the whole constantly arrived in the same ballpark- around 10^6 , 10 quadrillion cps. At present the world’s reckless supercomputer, China’s Tianhe-2, has truly flattened the sum, clocking in at about 34 quadrillion cps. Kurzweil recommended that we reflect about the phase of computers by watching at how many cps we can buy for \$1,000. When that number ranges human level-10 quadrillion cps- then that will mean AGI could alter actual fragment of life. Moore’s Law is a historic rule that the world’s extreme computing power pairs around every two years.

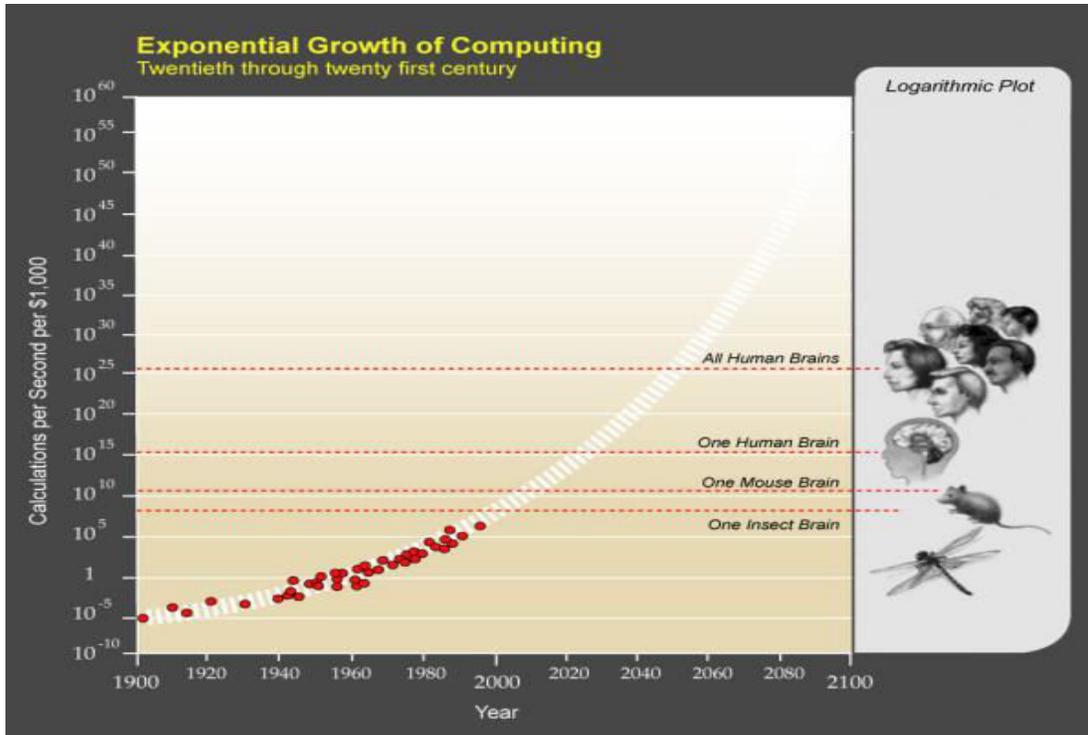


Figure 3: - Graph predicted trajectory of growth of computing over the years.

3.2 Second Key to create AGI: Making it smart

Researchers are still debating over the statistic – how to make a computer level – human intelligent and capable of knowing what a dog and a weird-written B and a mediocre movie is. But there are a group of far-fetched approaches out there at some fact, one of them will work. Here are three most mutual strategies I came across: -

1. Lift the brain

The science world is working tough on converse engineering the brain to figure out how development made such a stellar thing, we can attain it by 2030. Once we complete it, we will know the mysteries of how the brain runs so sturdily and we can draw stimulation from it and snip its inventions. Artificial neural network is another example that copycats the brain. It commences as a network of transistor “neurons”, linked to each other with inputs and outputs and know nothing. The way its “holds” is, it tries to do a chore, say handwriting recognition, at first, its neural firings and successive presumption at comprehending each letter will be completely arbitrary. But when told it got something right, the transistor associates that happened to generate the answer are reinforced; and when told wrong, the pathway networks are deteriorated. More extreme upliftment involves a strategy called “Whole Brain Emulation”, where the goal is to slice a brain into thin layers, scan each, use a software to build anpreciserebuilt 3-D model, and then implement the model on a controlling computer. We will then have a computer legitimatelyaccomplished of everything the brain is accomplished of – it would just need to learn and gather information. How far are we from attaining Brain Emulation?

Well, it seems like a downhearted project, as so far, we have not been able to match a 1mm-long flatworm brain, which comprises just 302 total neurons. The human brain contains 100 billion. But we don't know what the future holds? We might end up achieving it.

2. Try to make evolution do what it did but for us this time:

Constructing computer as prevailing as the brain is possible – our own brain is a resilient. And if the brain is too complex to emulate, we could try to emulate growth instead. The fact is, if we can emulate the brain, that might be like trying to build an aircraft by photocopying a bird's wing-flapping motions. So how can we aroused development to build AGI? The technique, called “Genetic Algorithms” would work. A collection of computers would try to do errands, and most effective, ones would be reared with each other by having partial of each of their programming combined together into a new computer. The least effective ones will be abolished. Over many reiterations, this natural collection progression would produce improved computers. The task would be generating a mechanized evaluation and breeding set on its own. But, the only thing hitch of photocopying evolution is that it likes to take a billion years to do things and we want to attain it in a limited decades.

3. Make this whole thing the computer's problem, not ours:

It would be the most auspicious way, we ever have. The idea is to build a computer, whose foremost services comprise doing AI research and coding changes to itself. We would clarify computers to be computer scientist, so that they could bootstrap their own development. Their chief job will be to figure out how to make themselves keener.

3.3 Expert Opinions: -

These expert opinions will both disrupt and stimulate you. People like late Stephan Hawking and Elon Musk have already cautioned the world for the approaching AI that grasp the future. A survey was directed for nearly 1,000 smart people with noticeable views on thinking machines. Perhaps not astonishingly, on the combined, the experts deliberate AI will yield humanity, but they also fear that it will terminate the society. Many of the experts particularized on their vision of our future with AI and some of the quotes make for the most captivating parts of a rather extensive report. I went through all of them, and handpicked some of the most fascinating ones, here they are: -

1. “AI will continue to concentrate power and wealth in the hands of few big monopolies based in the USA and China. Most people- and parts of the world-will be worse off”. – Mark Surman, Executive Director of Mozilla Foundation
2. “1984, George Orwell police state”. –Stavros Tripakis, an associate professor of Computer Science at Aalto University in Finland
3. “AI will be very useful in professional class but will be used to monitor and control everyone else”. – David. A. Banks, an associate research analyst with Social Science Research Council

4. “Smart farms and connected distribution systems will hopefully eliminate urban food deserts and enable food production in areas not suited for agriculture”. – Yvette Wohn, director of the Social Interaction Lab at the New Jersey Institute of Technology

3.3.1 Non-Expert Opinions: -

A few sets have recently made challenges to measure reviews. I tried to phrase my queries such that the responses can be related to the questionnaires. According to a current survey directed by a company, they enquired their 6,000 global clients what they think of AI. Here’s what they found:

1. Consumers unsuspectingly use additional AI than they comprehend; only 33% think they use technology with AI but 77% essentially use AI-powered service or device.
2. People think they get AI... but they really don’t – 70% say they understand AI but 50% don’t understand AI can solve problems, 37% don’t understand AI can interpret speech and 35% don’t understand AI can mimic humans.
3. AI today doesn’t meet expectations and stirs up fears – 70% are fearful of AI and only 27% think AI can deliver the same or better consumer service than humans.
4. Making consumers ensure if businesses should use it with them – 1/3 are neutral, 1/3 are uncomfortable with it.
5. Despite all this, the future for AI in CX looks bright – 73% are open to businesses using AI with them, if it makes life easier, 38% think AI will soon improve customer service Vs only 26% disagree

AI technology is developing rapidly and top businesses are revolving their AI strategy to modify how they involve with clients.

3.3.2 How AI is changing the way we work?

AI is reforming almost every means in which we work. Some ask that its business-like Human Resources, marketing and customer service are already in these early transformative periods but the current surveys offered that the transfigured stock chains and business units still belong to a comparatively separate feature. Despite AI’s potential, only 12% organizations have used it last year in some way, according to a survey 30,000 professionals. But an extra 30% prearranged on using it within 12 months. Embracing emergent technologies is now without jeopardy but those who take a chance now have the most to gain. On the casual side, this similar account expects that companies that wait will see a 20% cash stream fine. If AI primarily reforms of how we work, then it has the supremacy to do so well or worse.

4. AI Algorithms: Old and New: -

Deprived of any uncertainty, today’s major buzzword is AI. The word ‘Algorithm’ has transitioned from something only mathematicians used to something most marketing teams used to encourage AI-solutions. Throughout my research, I grasped that some startups just use the term algorithm without essentially amplifications of the statistic how these algorithms are being used to style project “AI”. What is an Algorithm? Fundamentally, the goal of an algorithm is to resolve a precise delinquent, typically defined

by a order of steps. For instance, a food recipe to make pasta – that’s an algorithm. An algorithm. An algorithm merely states a computer what to do next with an ‘and’, ‘or’ or ‘not’ report. Algorithms deliver the instructions for nearly any AI system you can think.

4.1 Traditional AI: -

In the 1940s and 1950s, a handful of scientists from several grounds (mathematics, engineering, economics, psychology) instigated to discuss the opportunity of designing an artificial brain. The Turing Test was developed by Alan Turing in 1950. He projected the “Turing Test which is used to adjust whether or not computer(machine)

Can reflect intelligently like humans”? The term “Artificial Intelligence” was objectified in 1956, at a significant conference in Dartmouth. At an initial phase of AI expansion, scientists and media hype made principled claims around the opportunities of AI revolution. In 1973, the British Government published an account named Light Hill report after an enquiry and apprehended the funding for many foremost AI research universities. Bulging AI approaches back then were Expert Systems and Fuzzy logic being the upper choice as a programming language among C/C++. The first noteworthy revolution in Expert System happened in the 80’s, and first and first SID was presented. Later, additional revolution was followed by IBM when its supercomputer Deep Blue conquered world champion, Garry Kasparov in 1997. It was demanded by IBM, it was not going to use AI as it was a disappointment in those days. The backpropagation algorithm that is in the core of Deep Learning/ Neural Networks was first familiarized in 1986.

4.2 Modern AI (2008+): -

The astonishing renaissance of AI that efficiently underway around the 2012 ImageNet rivalry has very much been drove by Deep Learning. That was the dawn of modern AI and is supposed to be the gun trigger for a new affluent in AI world. Numerous AI researchers including Geoff Hinton, Yann Le Cunn and Yoshua Bengio comprises several layers of dispensation that steadily illuminated outcomes. It is an old technique that dates back to the 1960s, 1970s and 1980s, but it suddenly showed the power when fed enough data and computing power. Deep Learning powers is just any exciting AI product from Alexa to uses of AI in radiology, to the ‘hot dog or not’ Spoof product from HBO’s Silicon Valley. It has proven remarkably effective at pattern recognition across a variety of problems – image classification, object recognition and some language problems. From AGI perspective, deep learning has stirred imaginations because it does more than what it is programmed to do. AI researchers themselves don’t always know exactly why deep learning does whatever it do. The AI research community settles, that if we want to reach AGI, efforts need to focus more on unsupervised learning – deep belief network, autoencoders and GANs.

4.2.1 GANs (Generative Adversarial Network)

GANs is a recent method, directly correlated to unsupervised deep learning, recognized in 2014. GANs work by forming a rivalry between two neural nets, trained on the same data. GANs have had their own evolution, with several versions of GAN came into court in 2017.

4.2.2 Alpha Zero

Reinforcement learning is another technique that goes back as far as the 1950s. However, that all changed in 2013 when Deep Mind, an independent startup, taught on AI to play 22 Atari

2600 games. In 2016, its AlphaGo, an AI proficient with strengthening learning came. Then just after a few months, in December 2017, Alpha Zero, a more comprehensive and prevailing version of AlphaGo was used in the same tactic. Alpha Zero was proficient through self-play using 5000 first generation TPUs and 64 second generation TPUs; once trained it ran on a single machine with four TPUs.

4.2.3 RCN (Recursive Cortical Network)

RCN is another hopeful tactic. RCN was established by Silicon Valley startup Vicarious; RCN was lately used to unravel text-based CAPTCHAs with a high precision rate using suggestively less data – 300 times less in the instance of a scene text recognition benchmark. There are many more approaches being considered, advanced or re-explored in light of the most current technological growth, counting in no particular order: Neural attention models, one shot erudition differential neural computers (DNC).

5. Conclusion

So, how close are we? How far are we from achieving AGI? Every AGI conference seems to query this question and come to diverse assumptions. The number that seems to pop up mostly is 2050. That's the date many foremost investigators say, we should assume to see vigorous AGI platforms in a widespread variety of accomplishing human responsibilities with the similar or greater human skills. A distinct study, newly conducted by James Barrat at Ben Goertzel's annual AGI conference, did away with percentages and basically questioned, participants according to them till when can we expect to reach AGI- by 2030, by 2050, by 2100 or after 2100. Here are the results:

By 2030: 42% of defendants

By 2050: 25% of defendants

By 2100: 20% of defendants

After 2100: 2% of defendants

In Barrat's survey, over two thirds of participants believe AGI will be here by 2050 and a little less than half predict AGI within next 15 years. Also, prominent is that only 2% don't think AI will be a part of our future ever. Irrespective of whether we get the AGI in the nearby term of not, it is clear that AI is getting massively more commanding, and will get even more so as it runs on even more prevailing computers, which increases genuine worries about what would happen if its supremacy was left in the incorrect hands. All of us gets frightened and enthusiastic about the impression of creating human-like keen devices. Science fiction and existing advancements of developer's show that we are about to hold the strand that would lead to accumulate a much greater body of data and become conscious that it is not a reiterating purchase wish. But noticeably we still have to do an enormous research to recognize the intelligence a bit better.

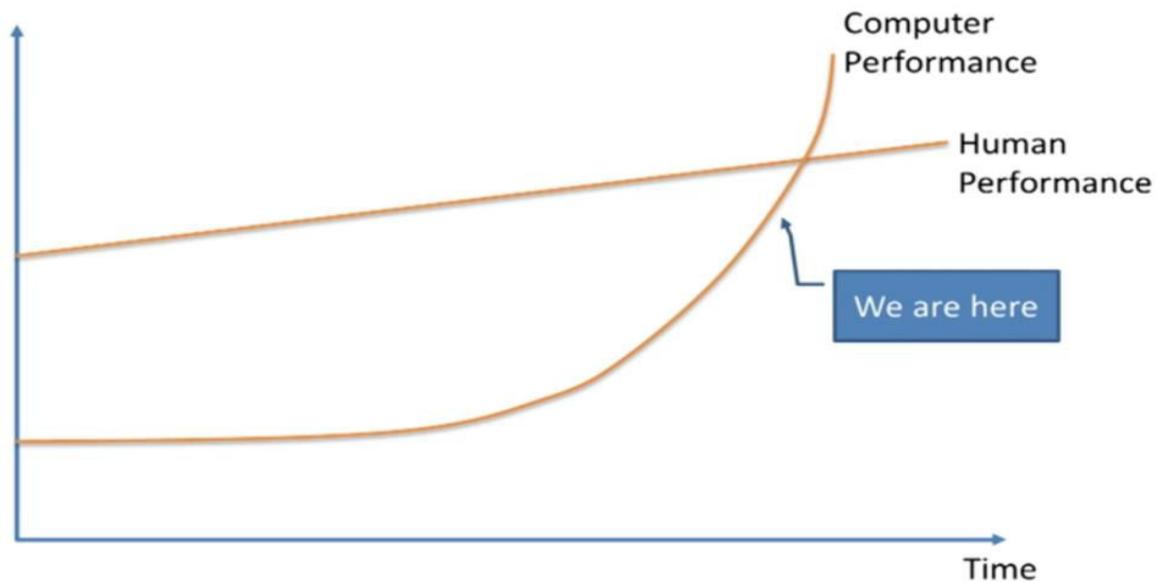


Figure 4: A graph representing how closer are we getting to reach intelligence

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