A study of "Artificial Intelligence: How close is AI to reach singularity in the near future"

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Abstract: *Artificial Intelligence (AI) is transforming the globe, and related innovations are never-ending. The rapid progress in AI leads to expanding its market and use case filled in every industry to reach singularity. It has increased attention that its development will one day start to grow exponentially, eventually leading it to take over the world and suppress humanity if it decides we are an obstacle to its goals.*

An online survey was taken under this research to analyse how much artificial intelligence has influenced society. Our study included people from various age groups and fields. A thorough analysis of comments made by AI singularity critics as well supporters of this notion was done. The intent of this study is focused on approximating the occurrence of AI Singularity. With a question whether we can duplicate the 3.5 billion years of evolution with algorithms. The main purpose of this research is to create awareness that AI development must include consideration for humanity and must not go against it.

One of the biggest challenges for singularity is the possibility of a machine, making an even better one. With a thought that it will eliminate initial machines in return, their creators.

Keywords: *Artificial intelligence, Singularity, Intelligence, AI machine.*

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Introduction:

As long as individuals are interested in improvement of technological development there will be a place for artificial technologies. Data is the new oil of the technological world. AI enables us to process large amounts of data and gain insights that were impossible before. AI systems can contain infinitely more usable data than a human brain, which means that an AI will help us analyseinformation, recognize patterns, evolve trends and identify them.

If you are not familiar with the word "Singularity" you are probably not alone. AI Singularity is defined as the moment when machines become both creator and smarter than the people who created them. Emerging Singularity in AI is seeking attention from all over the

world due to its rapid development. We are in a stage where we can find AI anywhere, anyplace and anytime.

Though singularity has not yet arrived, there is a possibility of its existence. Technological advancement has led to the making of robots like Sophia that look like human, are able to hold conversation and even read emotions. Since singularity is not a concerned topic for many AI companies but some AI researches has stated that the way development is going on it can be a threat to humanity.

Elon Musk, Technology Entrepreneur, and Investor has stated -"AI doesn't have to be evil to destroy humanity – if AI has a goal and humanity just happens to come in the way, it will destroy humanity as a matter of course without even thinking about it, no hard feelings."(https://analyticsindiamag.com/ten-famous-quotes-about-artificial-intelligence/ (Accessed: 28-12-21)

Since there is no way to calculate how and when the intelligence will evolve in unfolding the machines, one of the important things is that, it changes the very first principle of security. The only conclusion that may be reached is that there exists a range of well-researched positions on where AI research is headed and that its implementation should help mankind.

Intelligence to Super Intelligence [Singularity]

Figure 1 Source: ART BYPaul Sizer, https://paulsizer.com/

However, before embarking on a discussion of what is the possibility of occurrence of AI singularity, let's first understand what singularity really means and the various viewpoints of researchers. The idea of singularity can be traced back to a number of different thinkers. Following John von Neumann's death in 1957,

Stanislaw Ulam wrote: "One conversation [with John von Neumann] cantered on the ever-accelerating progress of technology and changes in the mode of human life, which gives the appearance of approaching some essential singularity in the history of the race beyond which human affairs, as we know them, could not continue."(Ulam1958) (Walsh, 2016) I.J. Good made a more specific prediction in 1965, calling it an "intelligence explosion" rather than a "singularity" (https://analyticsindiamag.com/ten-famous-quotes-about-artificial-intelligence/ (Accessed: 28-12-21)

In the book The Singularity is Near, by Ray Kurzweil believes that by the year 2045 we will experience the greatest technological singularity in the history of mankind: the kind that could, within a small span of time , overturn the institutes and fundamentals of our society and entirely change the way we view ourselves as human beings (Ray, 2005) He believes that Singularity can occur by creating a superhuman artificial intelligence (AI).

An AI that could bring up ideas that no human being has ever thought about, and be able to innovate technological tools that are more sophisticated and advanced than anything we have today. At the 2012 Singularity Summit, the study done by Stuart Armstrong on artificial general intelligence (AGI) predictions by experts resulted with an average value of year 2040.Late Stephen Hawking and Visionary entrepreneur Elon Musk have expressed concern that full artificial intelligence (AI) could result in human extinction.

In reality creating the software for a singularity-level computer intelligence will require fundamental scientific progress which is beyond of where we are today. This kind of progress is very different from the Moore's Law-style evolution of computer hardware capabilities (i.e. with reasonable accuracy that the number of transistors on an integrated circuit (and hence the amount of memory in a chip) will double every two years since 1975) (Robert, 2012)that inspired Kurzweil and Vinge.

Nine common objections thought out by Alan Turing in his seminal Mind paper (Turing 1950) (https://medium.com/analytics-vidhya (Accessed: 19-11-2021)·   The Theological Argument

- The Head in the Sand Argument

- The Mathematical Argument

- The Consciousness Argument

- The Various Disabilities Argument

- The Originality Argument

- The Continuity of the Nervous System Argument

- The Informality of Behavior Argument

- The Extrasensory Perception Argument

All depicting the notion of machines not being conscious, or not being creative, ultimately stating that intelligence is way more than thinking faster or longer about a problem than someone else.

Though, Moore's Law has certainly helped AI with the ability to learn off bigger data sets, quicker and faster. But for humans, intelligence depends on many other things that includes many years of experience and training. It is not at all clear whether we can short circuit this in silicon simply by increasing the clock speed.(Robert.2012).The belief of science fiction movies turning into reality is still a distant thought for many of us but with the approaching advancement in the field of AI and its reach to singularity has made this a topic of discussion. Our survey points out that nearly 52.2% of people are highly influenced by such movies but are also unsure about its occurrence. However, about 20% of the people have clearly denied such possibilities in the near future. About 30% of people are in favour that such an AI apocalypse may occur having a potential to overpower humans. Also, that the consequences of singularity and its potential benefit or damage to the human race are being intensely debated.

Has Singularity Already Fixed Its Roots?

Figure 2 Source: https://img.rolandberger.com

If we are talking about singularity today, we should first see how the AI market has expanded and how it has been indulged in every industry including human beings.

The AI which we are talking about today is not smarter than the human brain, but it's an alarming situation and we should not ignore it. Starting from unlocking phones using AI biometric applications, to clicking photos with an AI camera, to spam filtering in E-Mail through Machine Learning, travelling through Automated cars, Shopping, searching friend request through recommendation, many AI home products including washing machine, Oven etc. and many more.

Considering the rapid development in AI or singularity in AI to reach, Elon Musk is using this technology (AI) far more than any company. We cannot deny the fact that AI has make our life easier and also act as boon in covid- situation by providing different approaches to Human care such as "Digital Health" Some recent advancement in digital health includes "AI in beds to track quality of sleep, and the ability to detect COVID-19 in non-invasive ways by tracking the heart rate patterns via a smartphone"(Lukowicz and Slusallek 2018),and also many hospitals make use of Robots to transfer medicines that helps in decreasing human contact.

Researchers at the Indian Institute of Technology (IIT) are developing two robots which can be deployed in isolation wards for COVID-19 infected cases for delivery of food and medicine to patients and collection of contagious waste (Robert K Logan; Accessed: 21-10-2021). But we cannot also ignore the fact that our society, our market and our Industry is "AI addictive" and we know that Addiction of something is injurious.

Is Singularity Possible?

Though it is very difficult to predict singularity timeline and its occurrence but we can say that we are near to have AI environment rather than natural environment.

Google is trusting AI for solving user's problems in exciting new ways. Google is focusing on embedding AI in all its present and coming ventures in order to stay at the leading edge of today's technology. Mobile devices that were initially invented to let us make calls on the

move, have now evolved into an "anything, anywhere" machine that actually runs our lives for us.

Figure 3 Source: By Tim Peacock / for NBC https://www.nbcnews.com/mach/science/cyborgs-will-replace-humans-remake-world-james-lovelock-says-ncna896511 News

Self-driving automobiles, on the other hand, would not be possible without AI.The win by IBM's Watson against the former "Jeopardy!" winners, Ken Jennings and Brad Rutter, had taken everyone by surprise.

At the sixth iteration of the (ILSVRC) ImageNet Large Scale Visual Recognition Challenge held in 2015, Microsoft and Google computers enabled by Deep learning techniques outperformed humans in picture recognition by recognizing photos and objects in over 1,000 categories.

The San Jose Synopsys Science Fair has shown a dramatic increase in AI related projects(for kids in grades 6-12) , projects showing a reasonable sophistication of AI usage, with techniques ranging from middle schoolers using AI for diabetic retinopathy to Alzheimer. Even elementary school kids are now able to build custom AI projects.

Can AI Replace Its Co-Creators?

Since Technology opens various technical, social and political doors and is deterministic, we are at the stage where AI is found everywhere. The way AI innovation is happening, human replacement in some fields is an asset. Recent development in **the US, a robot carried out better and quicker surgery than a human doctor** and was also displaying various data regarding both the present stage and future possibilities which is out of scope for a human doctor. Recent report had predicted that with the help of AI, Breast **cancer can be detected in an early stage which can be a boon in healthcare.**

Figure 4 Source: https://techcaption.com

But every coin has two faces. Replacement of human beings is yet not predicted. AI machines basically work on insights, processed data. Imagine if inconsistencies in data happen, it will be more dangerous than nuclear power. It may happen that AI can solve problems accurately and faster than human beings but the human brain is far or beyond when we talk about intelligence.

Humans have a sense of self, have purpose, objectives, goals, and telos, as has been described by Terrence Deacon in his book Incomplete Nature. Humans have attributes that AI systems won't be ready to genuinely possess, like compassion, curiosity, imagination, intuition, emotions, values, morality, experience, wisdom, passion, desires, pleasure, aesthetics, joy, and judgement. Such attributes are essentials for human intelligence, in our opinion.

Singularity a Threat

Imagine a situation where AI had all the properties including emotion, self-awareness etc. It may happen that in order to save AI intelligent species or to survive they will try to eliminate their competitor, the human. Homo-sapiens, who are the co-creators of Ai, can be at the stage of extinction.

Biased algorithms

AI is based on machine learning that means biased data can result in blunders. A very well-known AI mishap is the Google hiring process that eliminated acceptance of female candidates as the data set fed for it depicted a trend of male employees. Garbage in, garbage out.

Automated Weapons

As technology is becoming increasingly easy, inexpensive and user-friendly, it will become available to everyone including those who intend to do harm.

AI in Military

- Ethical risks are important from a humanitarian standpoint.

- Operational risks may arise in terms of reliability,and security of AI systems.

- AI may increase the possibility of war, escalate present conflicts, and proliferate malicious actors.

Potential risks of AGI would be human extinction or unrecoverable global disaster (Robert K Logan (Editor), Adriana Braga (Editor),Boosarapu, Sandya, &Neeharika, 2020)mentioned by Stephen hawking's and other popular figures like Elon musk.

Need to Avoid AI Singularity

Figure 5 Source:https://ideas.ted.com

Avoiding intelligence to be super intelligence in reference to that it won't be dangerous to humankind. AI Researchers, inventors and public figures all are conscious of its occurrence. But we should come out from our imaginary world to the real world that Singularity in AI is somewhat still a question. Rather than that we should focus on an AI obsessed world as it is really an alarming situation. Today in Race of technology, there is no other technology which can compete with AI, even humans. AI is in competition with itself so that it can be more advanced which is making humans tech dependent.

AI development should focus on enhancing human cognitive capabilities and channelling human creativity, inventiveness, and intuition. Empowering humans to make important decisions in a more informed way, helping in understanding and to foresee long-term implications (Logan, 2012).

Hypothesis : The hypothesis of the study concerns the basic assumptions or beliefs upon which the entire study is based which would be verified by the study. The hypothesis of our research is as follows:

- Whether robots could take future job opportunities.

- Whether artificial intelligence's thinking power will be able to replace human thinking power.

- Whether computers could become conscious which is essential condition for the singularity.

- Whether AI can be benevolent.

- Whether we are doing something right now to avoid an AI apocalypse.

- Whether there will be significant impact of Singularity on society.

- Whether we should seek the ways to control the brain with technologies.

- Whether AI has the potential to wipe us out.

Objectives: To explain that it is possible that AI systems can reach a point where they can self-improve in a recurring and accelerating fashion.

- To study that AI can create a slightly more intelligent AI, but we also know that humans are co-creators of themselves in a sense that they do not entirely give themselves existence but do make their existence purposeful and do fulfil that purpose.

- To bring awareness that AI should be handled with care and right intention.

- To study the impact of Singularity in our life.

Methodology and Tools used: Sample Size: Data was collected through online google forms from nearly 300 people including teachers, students including 0-50 above age groups.

Tools and Techniques for the data collection: Data was collected through google forms, exploratory methods, data analysis and website references were used for insights for our study.

Methods of Data Analysis: Data received was analysed in MS Excel using statistics and graphs provided by google form. The contents of our research and findings were modified in the form of a research paper.

Major Findings: According to our survey which took place among different age groups through google

form. Our intention was to check the depth of AI in human life, human's thought process regarding AI singularity. A total of 300 respondents were taken into consideration in our study. Following are the highlights of our study.

1. How much do you support or oppose the development of AI?

This question was asked to check whether people are in favour of the development of AI which will help mankind or oppose the development of AI as it can eliminate homo sapiens. We came to know that 40.4% are in favour of "strongly supporting" which meanspeople are in support of the development of AI.
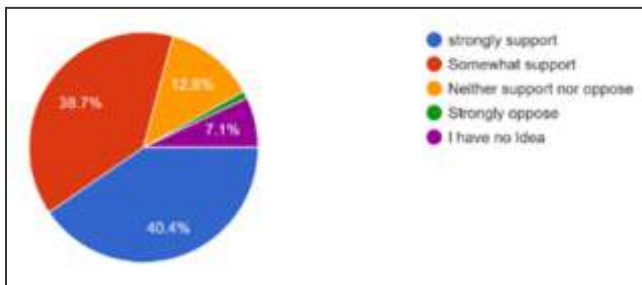

Fig. 6

Table 1.				
Options	0-18	19-30	30-50	50+
Strongly support	11	106	3	0
Somewhat support	25	84	5	1
Niether supportnor oppose	9	26	2	1
Strongly oppose	2	1	0	0
I haveno idea	8	12	1	0

2. Would you prefer Alexa shopping for you on amazon in future?

Artificial Intelligence has already overpowered our brains like with every suggested service or products on several applications AI is serving only what a targeted section of people would seek. Our survey shows that 51.5% of people would in reality completely rely on the artificial virtual assistance for purchasing on behalf of

them. There is a very thin line between the people who do not want the same. About 48.5% of people, we surveyed chose "No" stating they cannot give AI the power to choose for them.
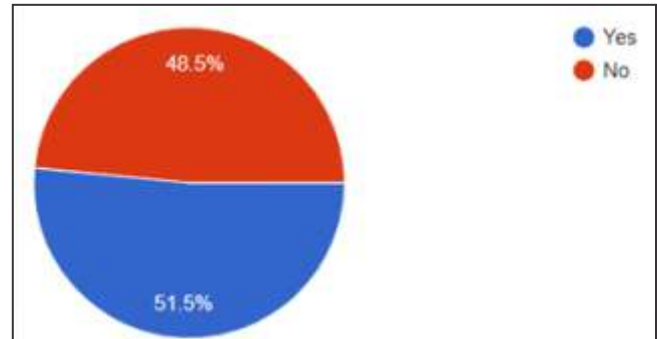

Fig. 7

Table 2 .		
Age - Group	Yes	No
0 - 18	30	25
19 - 30	121	108
30 - 50	2	9
50 above	0	2

3. Robots can take on tasks that are harmful, monotonous or complex for humans in the next 20 years.

Artificial intelligence has potentially large applications in Robotics and are also being used currently in a number of factories across the world. One of these survey findings shows that 44% of people agree that in the next 20 years Robots will help mankind or be helpful by taking harmful, monotonous or complex tasks. However, a very small portion of the correspondents deny the statement.
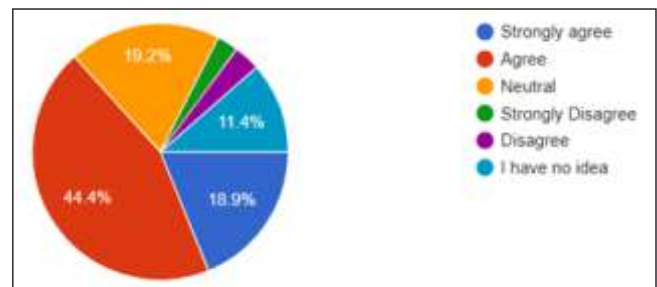

Fig. 8

Table 3.				
Age-Group	0-18	19-30	30-50	50 above
Strongly agree	8	45	3	0
Agree	26	98	6	2
Neutral	6	51	0	0
Disagree	4	5	1	0
Strongly disagree	0	7	1	0
I have no idea	11	23	0	0

4. AI will be used to fight against extreme poverty and improve quality of life for people in remote areas in the next 30 years.

One of the hypotheses of our study is whether AI can be benevolent. Our survey showed that around 40% of the people agreed that Artificial intelligence will help fight against poverty. Around 18% of people disagree with the fact that AI will be used in providing quality life to people.

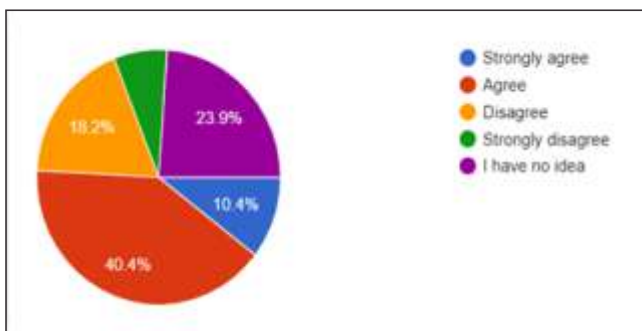| Table 4.				
Age-Group	0-18	19-30	30-50	50 above
Strongly agree	4	27	0	0
Agree	23	88	7	2
Disagree	9	42	3	0
Strongly disagree	3	17	1	0
I have no idea	16	55	0	0

Fig. 9

5. AI by itself will never entirely replace human intelligence.

One of our objectives was to find if Artificial intelligence after achieving singularity will be able to replace human intelligence. This entirely focuses on a scenario where humans will be completely dependent on artificial intelligence. Our findings show that 85.2% of the people who took the survey do not believe in the possibility of AI replacing human intelligence. However, a very small section of around 14.8% of people considers such possibilities. Hence, we may conclude that AI, an invention of the human intelligent mind will never be able to surpass the intelligence level of its creator.
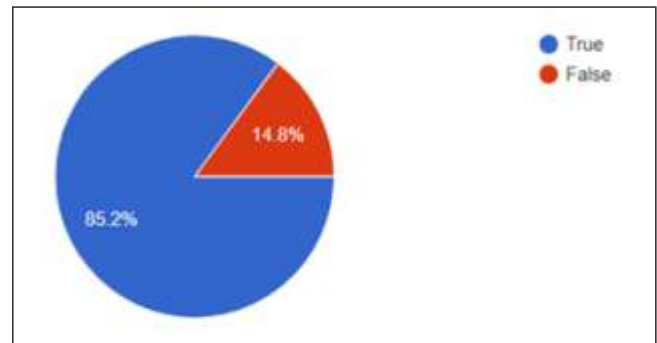

Fig. 10

Table 5.		
Age-Group	True	False
0-18	47	8
19-30	194	35
30-50	10	1
50 above	2	0

Limitations: The greatest fear in AI is its singularity and if we look today singularity has yet not come. AI still needs improvement as well as development in it. Hence, except we use machines which might exceed our conventional fashion of computation, we're possibly to come across many issues in which computational complexity basically limits performance.

There could be issues that even a superhuman intelligence can't resolve well approximately. Taking another argument, humans use a fraction of the capabilities of their amazing brains, and still are

struggling to change it. This provides an explanation for the overly positive claims made by a handful of AI researchers.

An AI intelligence may improve itself countless times, however the capacity to which its intelligence may change overall could be bounded.

When we talk about performing complex tasks AI can beat humans as well but compared to logical thinking or human cognition it is still below the bar. Rapid development in AI doesn't mean that it will be able to match the human brain. Our brains are more advanced and efficient. Precision is what the human brain can achieve but if we say AI its intelligence needs human intelligence.

Future Scope: Artificial Intelligence has proved itself to the world through its commendable usability in different fields. We now have AI robots learning through observing human actions, combating human trafficking, optimizing renewable energy, medical and in many more areas.

Still there is a lot of research taking place in AI like space technology, mainly brain simulation, to boost Internet security and technological singularity.

Having an overview of such benefits gives a vivid understanding of AI pointing towards its progress, resulting in new successes for humanity. Somehow it will take time but still AI can be seen as our future. However, the same picture of development reveals a certainty that high technological singularity advanced AI could dominate the human race.

Suggestions: Evolution in AI nowadays is more polished and also its uses are increasing in different reproving areas like public transportation, medical field, Military and even Public Security.

We cannot ignore the high damage that is being caused by AI in so many societal areas, which lead to different important questions that are related to legal, ethical, societal and technical views and also on how people will ensure that indulgence of AI's is beneficial and not going to harm them.

We agree that AI is facilitating us with different benefits. However, there should be some restrictions on the appropriate use of AI systems such as their measures must be in sync with the values and expectations of the user as well as the society. Existing Laws under which AI is considered should be modified further keeping in mind all the possible threats that may occur in future with its advancement. Regulatory bodies that areespecially focused on the various AI ventures are needed, that would guarantee the observance of human rights in the current information society. There's little to suggest since singularity still does not exist and AI is making a huge impact on human society. We want to state that as much as possible AI must result in being helpful for humanity, not a threat to it.

Conclusion: There is an increased craze for Artificial Intelligence and why not? Narrow AI that we use today is slowly taking steps towards artificial general intelligence and this requires certain standards to be followed in developing along with following ethical, moral values and respect for humans.

There are many fields in which AI needs to work on like in the medical field, learning algorithm, robotics, and space technology so that it can be an asset to humans.AI machines can think logically as they are, our blueprint but still there exist many restrictions which is our concern and if we overcome it in near future, it can surprise us and act as a saviour as well as our destroyer.

AI needs more attention as well as development to be more precise. Humankind should be conscious enough to realize such technological advancements, to ensure to live with the resulting intelligent species, the so-called super intelligent agents. Our future can be considered as machines with brains and values i.e., Artificial super intelligence.

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