Artificial Intelligence

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Abstract- *Artificial Intelligence is the study of how to make computers do things which at the moment people do better. The primary goal of artificial intelligence is to improve computer behaviour so that it can be called intelligent. The origins of Artificial Intelligence usually incorporate the theories and thoughts proclaimed by several ancient Greek philosophers and scientists.*

I. INTRODUCTION

Artificial Intelligence (AI) is a field of study based on the premise that intelligent thought can be regarded as a form of computation-one that can be formalized and ultimately mechanized. To achieve this, however, two major issues need to be addressed. The first issue is knowledge representation, and the second is knowledge manipulation. Within the intersection of these two issues lies mechanized intelligence. AI combines precision and computational power with pure logic, to solve problems and reduce error in operation. Already, robot expert systems are taking over many jobs in industries that are dangerous for or beyond human ability. I highlight that the potential applications of Artificial Intelligence are abundant. They stretch from the military for autonomous control and target identification, to the entertainment industry for computer games and robotic pets**.**

EARLY HISTORY:

The history of Artificial Intelligence (AI) began in antiquity, with myths, stories and rumors of artificial beings endowed with intelligence or consciousness by master craftsmen. The seeds of modern AI were planted by classical philosophers who attempted to describe the process of human thinking as the mechanical manipulation of symbols. This work culminated in the invention of the programmable digital computer in the 1940s, a machine based on the abstract essence of mathematical reasoning. This device and the ideas behind it inspired a handful of scientists to begin seriously discussing the possibility of building an electronic brain**.**

II. CURRENT STATUS OF ARTIFICIAL INTELLIGENCE

The field has been growing at a rapid rate over the past couple of years, and it often is somewhat hard to keep up with the subject, especially if you are not directly involved. A significant portion of information circulating on the matter is fragmented and esoteric. Hopefully, by the end of the post, you shall have a general idea of what is transpiring.

Before proceeding it is important to mention that "real" AI does not exist at the present moment, otherwise known as Artificial General Intelligence (AGI). These would be AI systems that can perform all human-level tasks with equal proficiency. Currently, the only systems that exist are known as "narrow" AI. What this implies is that they can only produce meaningful results inside a narrow domain. So for those that are worried about "the rise of the machines", their fears can be set aside as they are misplaced. With that out the way, let us get into the central subject matter**.**

III. CHALLENGES OF ARTIFICIAL INTELLIGENCE

Building trust: The AI is all about science, technology, and algorithms which mostly people are unaware of, which makes it difficult for them to trust it.

AI human interface: Being a new technology, there is a huge shortage of working manpower having data analytics and data science skills; those in turn can be deputed to get maximum output from artificial intelligence. As the advancement of AI rising, businesses lack a skilled professional who can match the requirement and work with this technology. Business owners need to train their professionals to be able to leverage the benefits of this technology.

Investment: AI is an expensive technology that not every business owner or manager can invest money into as large amount of computing power will be necessary and sometimes hardware acceleration with GPU, FPGA, or ASIC must be in place to run machine learning models effectively. Though adaptability of AI is surging high, it has not been integrated fully in business's value chain at the scale which it should have. Moreover, enterprises of those who have incorporated are still in nascent stage which have resulted in the slowdown in the lifting of the AI technology at scale and thus been deprived of cost benefit of scale. AI investors are a bit sceptical from parking their money in potential start-ups.

Software malfunction: With machines and algorithms controlling AI, decision-making ability is automatically ceded to code-driven Black Box tools. Automation makes it difficult

to identify the cause of mistakes and malfunctions. Moreover, due to the lack of ability of human beings to learn and understand how these tools work, they have little or no control over the system which is further complicated as automated systems become more prevalent and complex.

High expectations: Research in artificial intelligence is conducted by a large pool of technologists and scientists with varying objectives, motivation perspectives, and interests. Main focus of research is confined in understanding the underlying basis of cognition and intelligence with heavy emphasis on unravelling the mysteries of human intelligence and thought process. Not everyone understands the functioning of AI and might also have very high expectations of functioning.

Data security: Machine learning and decision-making capability of AI and AI application are based on huge volumes of classified data, often sensitive and personal in nature. This makes it vulnerable to serious issues like data breach and identity theft. Mostly, companies and government striving for profits and power, respectively, exploit the AI-based tools which are generally globally networked which make them difficult to regulate or rein in.

Algorithm bias: AI is all about data and algorithms. Accuracy of decision-making capability of AI is purely based on how accurately it has been trained and by using authentic and unbiased data. Unethical and unfair consequences are inherent in vital decision-making if data used for training is laced with racial, gender, communal, or ethnic biases. Such biases will probably be more accentuated, as many AI systems will continue to be trained using bad data.

Data scarcity: Power and capabilities of AI and AI applications depend directly on the accuracy and relevancy of supervised and labelled datasets being used for training and learning. There is scarcity of quality-labelled data. Though efforts are underway by means of transfer learning, active learning, deep learning, and unsupervised learning, to devise quality-labelled data, it will only aggravate the problem.

IV. FUTURE OF ARTIFICIAL INTELLIGENCE

Technology moves at breakneck speed, and we now have more power in our pockets than we had in our homes in the 1990s. Artificial intelligence (AI) has been a fascinating concept of science fiction for decades, but many researchers think we're finally getting close to making AI a reality. NPR notes that in the last few years, scientists have made breakthroughs in "machine learning," using neural networks, which mimic the processes of real neurons.

This is a type of "deep learning" that allows machines to process information for themselves on a very sophisticated level, allowing them to perform complex functions like facial recognition. Big data is speeding up the AI development process, and we may be seeing more integration of AI technology in our everyday lives relatively soon. While much of this technology is still fairly rudimentary at the moment, we can expect sophisticated AI to one day significantly impact our everyday lives. Here are 6 ways AI might affect us in the future.

- **Automated Transportation**
- **Cyborg Technology**
- **Taking over dangerous**
- **Solving climate change**
- **Robot as friends**
- **Improved elder care**

V. PRO'S AND CON'S

Here are the advantages of AI:

Less Room for Errors:

As decisions taken by a machine are based on previous records of data and the set of algorithms, the chances of errors reduce. This is an achievement, as solving complex problems that require difficult calculation, can be done without any scope of error.

Have you heard of digital assistants? Advanced business organizations use digital assistants to interact with users, something that helps save them time. This helps businesses fulfil user demands without keeping them waiting. They are programmed to give the best possible assistance to a user.

Right Decision Making:

The complete absence of emotions from a machine makes it more efficient as they are able to make the right decisions in a short span of time. The best example of this is its usage in healthcare. The integration of AI tools in the healthcare sector has improved the efficiency of treatments by minimizing the risk of false diagnosis.

Implementing AI in Risky Situations:

Certain situations where human safety is vulnerable, machines that are fitted with predefined algorithms can be used. Nowadays, scientists are making use of complex

machines to study the ocean floor where human survival becomes difficult.

Can Work Continuously:

Unlike humans, machines do not get tired, even if it has to work for consecutive hours. This is a major benefit over humans, who need rest from time to be efficient. However, in the case of machines, their efficiency is not affected by any external factor and it does not get in the way of continuous work.

Here are the disadvantages of AI:

Expensive to Implement:

When combining the cost of installation, maintenance and repair, AI is an expensive proposition. Those who have huge funds can implement it. However, businesses and industries that do not have funds will find it difficult to implement AI technology into their processes or strategies.

Dependency on Machines:

With the dependency of humans on machines increasing, we're headed into a time where it becomes difficult for humans to work without the assistance of a machine. We've seen it in the past and there's no doubt we'll continue seeing it in the future, our dependency on machines will only increase. As a result, the mental and thinking abilities of humans will actually decrease over time.

Displace Low Skilled Jobs:

This is the primary concern for technocrats so far. It is quite possible that AI will displace many low skilled jobs. As machines can work 24*7 with no break, industries prefer investing in machines as compared to humans. As we are moving towards the automated world, where almost every task will be done by the machines, there is a possibility of large-scale unemployment. A real-time example of this is the concept of driverless cars. If the concept of driverless cars kicks in, millions of drivers will be left unemployed in the future.

Restricted Work:

AI machines are programmed to do certain tasks based on what they are trained and programmed to do. Relying on machines to adapt to new environments, be creative and think out of the box will be a big mistake. This is not possible because their thinking zone is restricted to only the algorithms that they have been trained for.

VI. CONCLUSION

AI is at the centre of a new enterprise to build computational models of intelligence. The main assumption is that intelligence (human or otherwise) can be represented in terms of symbol structures and symbolic operations which can be programmed in a digital computer. Aspects of intelligent behaviour, such as solving problems, making inferences, learning, and understanding language, have already been coded as computer programs, and within very limited domains. AI programs can outperform human experts. Now the great challenge of AI is to find ways of representing the commonsense knowledge and experience that enable people to carry out everyday activities such as holding a wide-ranging conversation, or finding their way along a busy street. Conventional digital computers may be capable of running such programs, or we may need to develop new machines that can support the complexity of human thought.