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A Brief Introduction on Artificial Intelligence

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ABSTRACT

When we think about the term "artificial intelligence", many of us imagine an army of human-like robots rebelling against humanity, while a few people from a more positive thinking community are envisioning a brighter future where AI serves them in all possible ways from preparing your regular coffee with the right amount of sugar to personalizing and prioritizing your office activities. AI should be seen as a broad concept in which machines can deal with tasks in a way we would call intelligent or smart. AI is a bunch of technologies that include machine learning and some other technologies like natural language processing (NLP), inference algorithms, neural networks, etc. To tick the box of being called AI, machines/programs must be capable of a few things. It should be able to mimic the human thought process and behavior and also act intelligent, rational and ethical just like the way humans do. AI has already made its way in our day-to-day lives through several applications we use but are not aware of. For example, personal assistants like Apple's Siri or Google's Google Assistant or Amazon's Alexa are some of the most widely used digital assistants who employ the concept of Artificial Intelligence like recognizing voices of various users, analyze the information they are given and provide an answer or a solution. There are many more examples. Experts predict AI will outperform humans at virtually everything in the following 45 years.

Keywords— *Algorithm, Machine Learning, Deep Learning, Neural Networks, Intelligence, Automate*

1. INTRODUCTION

Artificial Intelligence is an interdisciplinary concept that studies the possibility of creating machines capable of interacting with their surroundings and acting upon the received data in a manner considered intelligent and perceptive.

The word "intelligence" derives from the Latin terms *intelligentia* and *intellēctus*, which roughly translated as the ability to perceive, comprehend or understand something. More recently intelligence has also been defined as the ability to demonstrate logical coherence, show reason, behave autonomously and be adaptable to situations, later updated again to include emotional intelligence, spatial awareness, kinesthetic intelligence, and many more aspects besides. The short answer is that we have not been able to successfully pin the term "intelligence" down to a tight definition, and this is as one might expect also the case with AI.

Therefore, we can apply AI in digital fields such as audio or visual recognition, driverless cars, personalize recommendations on social media platforms and streaming services as well as use it for data analysis and prediction in large enterprises. AI applies and promotes the notion of autonomy by learning from its experiences each time and improving its performance, therefore, applying adaptability as well.

Usage of the term "adaptability" leads us to what is known as "Machine Learning" which allows a system to make use of various algorithmic techniques to improve their prediction and analysis of data each time. Machine Learning has a subset which is called Deep Learning that has networks capable of learning unsupervised, from data that is unstructured or unlabeled. Deep Learning algorithms are carried out by neural networks which are a series of algorithms that attempt to recognize the underlying relationships in a set of data through a process that mimics the way a human brain operates. In this sense, neural networks refer to systems of neurons that are artificial in nature.

2. NEED FOR AI

The need for AI is inevitable. From preparing coffee to taking your dog to walk to getting the kids ready for school to driving late to office and missing out on the presentation. It is said by many expert scientists that the human brain is at its most when it is focusing on a single task. That is when one can finish a task from start to end before moving onto the next.

Multitasking is often thought of as a tough thing to do for humans since it requires the human brain to share its intelligence on multiple tasks, thus not being able to dedicate complete focus on a single activity. What if there was something that would mimic

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your regular activities for you so that you had time to perform other tasks? Or what if your presentation was better updated to match the trend? All of these queries are addressed by AI where it tries to automate most of the operations based on our preferences. As discussed above, it learns from its experience each time and improves its performance. After giving inputs to the machine a couple of times, it learns from it and then the next time tries to predict what we want and prompts it.

We also require AI since the work we need to do is increasing daily. So it's a good idea to automate the routine work. This saves the manpower of the organization and also increases productivity. Additionally, the company can also get skilled workers for the development of the company. The goal of organizations today is to automate all the regular and routine work using intelligent programs. Life gets easier when all of our tasks and needs are carried out automatically using a virtual form of intelligence that meets our requirements without our physical involvement in it.

The automation process is carried out by an application of AI called Machine Learning which is the study of algorithms and statistical models that computer systems use to perform a specific task without using explicit instructions, relying on patterns and inference instead.

3. TRENDING TECHNOLOGIES IN AI

Some of the most popular and trending AI technologies are discussed below-

3.1 Natural Language Generation

Even for humans to communicate efficiently and clearly can be tricky. Similarly, for machines to process information is an entirely different process than the human brain, and it can be extremely tricky and complex. Natural Language Generation is a sub-discipline of AI that converts text into data and helps the systems to communicate ideas and thoughts as clearly as possible. It is used in customer service, widely, to create reports and market summaries.

3.2 Speech Recognition

Speech Recognition is used to convert and transform human speech into a useful and comprehensive format for computer applications to process. The transcription and transformation of human language into useful formats is witnessed often nowadays and is growing rapidly.

3.3 Machine Learning Platforms

Machine Learning is a sub-discipline of computer science as well as an important branch of AI. Its objective is to develop new techniques enabling computers to learn and hence become more intelligent. With the help of algorithms, APIs (application programming interface), development, training tools, big data and applications, machine learning platforms are becoming more popular. They are widely used for the purpose of categorization and prediction.

3.4 Virtual Agents

A virtual agent refers to a computer agent or a program that is capable of interacting effectively with humans. It is used in customer service through Chabots as well as a smart home manager.

3.5 Deep Learning Platforms

Deep Learning Platforms is a form of machine learning that duplicates the neural circuits of the human brain to process data and create patterns for decision making. In this unique technology, algorithms use artificial neural networks. A few of its applications are automated speech recognition, image recognition and prediction of anything that can be sensed in the digital sphere.

3.6 Robotic Process Automation

Robotic Process Automation refers to the functioning of corporate processes due to mimicking human tasks and automating them. In this particular sphere, it is important to bear in mind that AI is not meant to replace humans, but to support and complement their skills and talent.

3.7 Text Analytics and Natural Language Processing (NLP)

Natural Language Processing focuses on the interactions between human languages and computers. It uses text analytics to analyze the structure of sentences as well as their interpretation and intention through machine learning. This technology is widely adopted in fraud detection and for security systems. Many automated assistants and applications derive unstructured data by NLP.

3.8 Biometrics

Biometrics deals with the recognition, measurement, and analysis of the physical features of the body's structure, form, and human behavior. It fosters organic interactions between machines and humans as it works with touch, image, speech and body language. It is predominantly used for the purpose of market research.

3.9 Image Recognition-

Image recognition refers to the process of identifying and detecting a feature in a video or an image. It can help the process of image searches greatly as well as to detect license plates, diagnose diseases and study personalities.

4. USES AND SOME APPLICATIONS OF AI

AI manipulates many applications that require some kind of automation and learning in its process. AI is advancing dramatically. It is already transforming our world socially, economically and politically. AI can perform tasks such as identifying patterns in the data more efficiently than humans thereby enabling the following applications.

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4.1 AI in Business Growth

Businesses to gain more insight out of their data, drive marketing decisions and initiatives, improve operations and customer service. From managing global supply chains to optimizing delivery routes, AI is helping companies of all sizes and in all industries improve productivity and the bottom line at every stage of the business lifecycle from sourcing material to sales and accounting to customer service. It's allowing companies to design, produce and deliver products and services better than ever before.

4.2 AI in Healthcare

Companies are applying machine learning to make better and faster diagnoses than humans. One of the best-known technologies is IBM's Watson. It understands natural language and can respond to questions asked of it. The system mines patient data and other available data sources to form a hypothesis, which it then presents with a confidence scoring schema. AI is a study realized to emulate human intelligence into computer technology that could assist both, the doctor and the patients in the following ways:

- By providing a laboratory for the examination, representation, and cataloging medical information
- By devising novel tool to support decision making and research
- By integrating activities in medical, software and cognitive sciences
- By offering a content-rich discipline for the future scientific medical communities.

4.3 AI in education

It automates grading, giving educators more time. It can also assess students and adapt to their needs, helping them work at their own pace.

4.4 AI to Tackle Climate Change

By looking at data about the changing conditions of the world's land surfaces, it provides a very accurate picture of how the world is changing. The more accurate we're able to be at the current status of our climate, the better our climate models will be. This information can be used to identify our biggest vulnerabilities and risk zones.

Artificial intelligence and deep learning can help climate researchers and innovators test out their theories and solutions about how to reduce air pollution and other climate-friendly innovations. One example of this is the Green Horizon Project from IBM that analyses environmental data and predicts pollution as well as tests "what-if" scenarios that involve pollution-reducing tactics.
The damage to human lives and property can be reduced if there are earlier warning signs of a catastrophic weather event. There has been significant progress in using machine learning algorithms that were trained on data from other extreme weather events to identify tropical cyclones and atmospheric rivers. The earlier warning that governments and citizens can get about severe weather, the better they are able to respond and protect themselves.

4.5 AI in Agriculture

Farms produce tons of data points on the ground daily. With the help of AI, farmers can now analyze a variety of things in real-time such as weather conditions, temperature, water usage or soil conditions collected from their farm to better inform their decisions. For example, AI technologies help farmers optimize planning to generate more bountiful yields by determining crop choices, the best hybrid seed choices, and resource utilization.

AI systems are also helping to improve harvest quality and accuracy what is known as precision agriculture. Precision agriculture uses AI technology to aid in detecting diseases in plants, pests, and poor plant nutrition on farms. AI sensors can detect and target weeds and then decide which herbicides to apply within the right buffer zone. This helps to prevent over-application of herbicides and excessive toxins that find their way in our food. Farmers are also using AI to create seasonal forecasting models to improve agricultural accuracy and increase productivity.

5. WHEN DOES AI BECOME DANGEROUS

While we haven't achieved super-intelligent machines yet, the legal, political, societal, financial and regulatory issues are so complex and wide-reaching that it's necessary to take a look at them now so we are prepared to safely operate among them when the time comes. Outside of preparing for a future with super-intelligent machines now, artificial intelligence can already pose dangers in its current form. Some of the key AI-related risks are discussed below.

5.1 Autonomous weapons

AI programmed to do something dangerous, as is the case with autonomous weapons programmed to kill, is one way AI can pose risks. It might even be plausible to expect that the nuclear arms race will be replaced with a global autonomous weapons race. Russia's President Vladimir Putin said: "*Artificial intelligence is the future, not only for Russia but for all humankind. It comes with enormous opportunities, but also threats that are difficult to predict. Whoever becomes the leader in this sphere will become the ruler of the world*."

Aside from being concerned that autonomous weapons might gain a "mind of their own," a more imminent concern is the dangers autonomous weapons might have with an individual or government that doesn't value human life. Once deployed, they will likely be difficult to dismantle or combat.

5.2 Social manipulation

Social media through its autonomous-powered algorithms is very effective at target marketing. They know who we are, what we like and are incredibly good at surmising what we think. Investigations are still underway to determine the fault of Cambridge Analytica and others associated with the firm who used the data from 50 million Facebook users to try to sway the outcome of the

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2016 U.S. presidential election and the U.K.'s Brexit referendum, but if the accusations are correct, it illustrates AI's power for social manipulation. By spreading propaganda to individuals identified through algorithms and personal data, AI can target them and spread whatever information they like, in whatever format they will find most convincing—fact or fiction.

5.3 Invasion of privacy

It is now possible to track and analyze an individual's every move online as well as when they are going about their daily business. Cameras are nearly everywhere, and facial recognition algorithms know who you are. Governments and organizations can wrongly use this data to tyrannize certain people. It's not only an invasion of privacy it can quickly turn to social oppression.

5.4 Misalignment between our goals and the machine's

Part of what people value in AI-powered machines is their efficiency and effectiveness. But, if we aren't clear with the goals we set for AI machines, it could be dangerous if a machine isn't armed with the same goals we have. For example, a command to "Get me to the airport as quickly as possible" might have dire consequences. Without specifying that the rules of the road must be respected because we value human life, a machine could quite effectively accomplish its goal of getting you to the airport as quickly as possible and do literally what you asked, but leave behind a trail of accidents.

6. CONCLUSION

The upwards trend in capabilities of AI systems will likely continue. Systems will eventually become capable of solving a wide range of tasks and that the adoption of AI within many industries will continue. Evidence suggests AI is currently unable to reproduce human behavior or surpass human thinking. However, steady gradual improvements in AI could reach a point where AI exceeds current expectations. The continued development of AI will depend on moral public opinion regarding the benefits and acceptability of it, on businesses continuing to gain a competitive advantage from using it, and continued funding for research and development of it.

In the future, if over-reliance is placed on technology people could become disconnected from the process. They may cease to understand how things work or fail to appreciate how bad things are when they go wrong. While an AI system can present data and recommendations, the ultimate decision is taken by humans. Greater numbers of workers will be 'new' to their roles and tasks. Therefore, ongoing workforce training and re-learning will be increasingly important in the future.

To harness the power and benefits of machine learning we need to decide what we want the machines to learn, and what questions we want them to answer. It is important that controls and goals for AI are set, and that a lot more empirical work needs to be done to gain a better understanding of how goal systems in AI should be built, and what values the machines should have.

If AI is seen to contribute to business success via enabling a better understanding of customers, along with a more rapid response to their needs, then its uptake within the world of work is likely to continue. In the future, many tasks will have the opportunity of input from AI. However, rather than replacing humans, it is the combination of AI and humans that is likely to bring the greatest benefits to the working world. Therefore, we might conclude that it will be how AI "interacts" with humans that will influence its role in the future world of work. If human values are carefully joined and embedded into AI systems then socially unacceptable outcomes might be prevented.

7. REFERENCES

[1] Oksana Tunikova. *What You Need To Know About Artificial Intelligence*. [Online]. Available from: https://stopad.io/blog/artificial-intelligence-facts [Accessed 5th January 2018].
[2] Mr Trask. *Artificial Intelligence — a brief overview*. [Online]. Available from: https://hackernoon.com/artificial-intelligence-a-brief-overview-4459fd16408b [Accessed 29th May 2018].
[3] Bernard Marr. *What Is The Importance Of Artificial Intelligence (AI)*. [Online]. Available from: https://bernardmarr.com/default.asp?contentID=1829
[4] Bernard Marr. *The Amazing Ways We Can Use AI To Tackle Climate Change*. [Online]. Available from: https://bernardmarr.com/default.asp?contentID=1360
[5] VALLURI. *Artificial Intelligence and its Applications*. [Online]. Available from: https://www.valluriorg.com/blog/artificial-intelligence-and-its-applications/ [Accessed 22nd August 2017].
[6] Edureka. *Top 15 Hot Artificial Intelligence Technologies.* [Online]. Available from: https://www.edureka.co/blog/top-15-hot-artificial-intelligence-technologies/ [Accessed 02nd January 2020].
[7] Bernard Marr. *Is Artificial Intelligence Dangerous? 6 AI Risks Everyone Should Know About*. [Online]. Available from: https://www.forbes.com/sites/bernardmarr/2018/11/19/is-artificial-intelligence-dangerous-6-ai-risks-everyone-should-know-about/#3c5e80142404 [Accessed 19th November 2018].
[8] Helen Beers. *Artificial Intelligence: discussion and conclusions.* [Online]. Available from: https://www.shponline.co.uk/technology/artificial-intelligence-discussion-and-conclusions/ [Accessed 15th November 2016].

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