USAGE OF ARTIFICIAL INTELLIGENCE DURING THE NEW NORMAL

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Abstract

Artificial Intelligence (AI) is an area of computer science that involves the creation of smart machines capable of performing tasks by mimicking the capabilities of the human mind. COVID-19 is an infectious disease that became the highlight of the year 2020. In March 2020, the World Health Organization (WHO) has declared COVID-19 outbreak as pandemic. Applications of AI were steadily growing and an unprecedented surge in its application was observed during this pandemic. COVID-19 forced us to change our lifestyles and made us adapt to a New Normal, where AI currently is the key player. The aim of this research is to explore the role AI plays during the New Normal and how it aids in our fight against this ongoing pandemic.

Key words: Artificial Intelligence, COVID-19, Pandemic, New Normal

1.Introduction

"Can machines think?"

This was a very simple question raised by Alan Turing the mathematician and this was the biggest turning point in Artificial Intelligence. Not more than a decade after the encryption machine that was developed by the Nazis, "Enigma" changed the way of thinking in many mathematicians and scientists on what will happen if machines start working by themselves. Then and there, the idea of a machine that thinks rationally and humanly came into debate.

In 1935 Turing described an abstract computing machine that consisted of an unlimited memory and a scanner that moves forward and back through the memory, symbol by symbol, reading what it finds and writing further symbols. The process of the scanner is coded by a program of instructions that also is stored in the memory in the form of said symbols. This is Turing's "stored-program concept", and implicit in it is the possibility of the machine operating on, and so modifying or developing, its own coded program. This theory of Turing is now known simply as the "universal Turing machine" (Copeland, 2020).

Artificial intelligence is something that is man-made. Generally, artificial intelligence refers to the simulation of human intelligence in machinery that is preprogrammed to think like humans and mimic their behavior (Frankenfield, 2021). The term AI is often used to the project of developing systems endowed with the intellectual processes characteristics of humans such as the ability to think, analyze, discover the meanings and learn from the past mistakes or experience (Copeland, 2020).

As technology has been developing over the years, previous benchmarks that defined AI have expired. As an example, machinery that calculated basic functions or recognized text through optical character recognition are no longer considered to embody AI , because this function is now considered as an inherent computer function.

Simply, AI works by consolidating a lot of information with quick, iterative processes and intelligent calculations, permitting the product to gain consequently from examples or highlights in the information. AI is a wide field of study that incorporates numerous hypotheses, strategies and innovations (Jim, 2020).

There are few basic components that are included in the field of AI. They are;

01. Machine Learning
02. Neural Network
03. Deep Learning
04. Computer Vision
05. Cognitive Computing
06. Natural Language Processing

Machine learning, simply is a subset of the applications of AI that learn new things by its own. As the program gets or digests more data, it has the ability to reprogram and perform the tasks. Through machine learning, it performs the same specified task but with increasingly greater accuracy (Education, 2020). It utilizes techniques from neural networks, measurements, tasks exploration and physical science to discover covered up experiences in information without expressly being modified for where to look or what to conclude (Jim, 2020). The neural network is a type of machine learning that is built to interconnect units to process information.

On the other hand, Deep learning is very similar to the machine learning. This can be identified as another machine learning application that learns itself how to perform its specified tasks better but without human intervention. This uses more neural networks that contain more layers of processing. This is beneficial in computing power and improves training techniques that are used to learn complex patterns through huge databases.

The purpose of cognitive computing is to imitate and develop the interaction between humans and machines. This tries to recreate a human though by understanding human language and images. Natural language processing is basically the understanding that the AI has towards human language and its ability to interpret and recognize language and speech. Implementation of identification and interpretation of images, graphs and tables are called Computer vision (Otte, 2020).

In the present, there are four types of tests we can conduct to determine if the Artificial Intelligence powered machinery are really acting like a human. These tests or approaches are mainly focused because of the uncertainty that we might come across some issues in the future. Even though an AI powered device could be human-like, still we cannot be very sure that it will continue to behave the same way with time. These four approaches will determine the human likeness of an AI entity (Advani, 2021);

01. Turing Test – This test is conducted with a human where the human should not be able to identify that they are talking to Artificial intelligence. This measures the language processing ability, the knowledge as memory, automated reasoning and machine learning.
02. The Cognitive Modeling Approach – This approach considers the three factors; Introspection, Psychological Experiment and Brain Imaging.

03. The Law of Though Approach –This consists with a number of logical statements where solving them would need a lot of thinking. This set of statements would be quite impractical to solve just using algorithms when there are too many parameters.

04. The Rational Agent Approach – this approach checks the irrationality of the Artificial Intelligence. This would be given problems where you cannot apply logical thinking.

With all these, scientists have now introduced three different stages in AI. Different AI types are built for different purposes. The below mentioned are these different stages:

1.1 Artificial Narrow Intelligence (ANI)

Simply ANI specializes in one area and solves one problem. Siri, Alexa and Cortana are some examples that fall under this category. These systems are designed only to solve one single task but also to perform this specific task very well. Even though this is the only type of AI that exists currently, ANI still being very limited upon some parameters is a drawback. Yet, they are able to surpass human thinking up to some level.

1.2 Artificial General Intelligence (AGI)

AGI is defined as AI which has a human-level of cognitive function, across a wide variety of parameters such as language and image processing, computational functioning and reasoning. Unfortunately, this is still a theoretical concept. Building an AGI will require a great number of ANIs to develop its communication and human mimicking.

1.3 Artificial Super Intelligence (ASI)

As AGI is also in a theoretical stage, obviously the third and final stage, which is ASI, can be brought out as a science fiction. Yet, scientists hope that it is possible. An ASI system would be able to surpass each and every human capability. Not only that but also it would be able to advance itself into realms that we do not imagine of. It's believed that ASI will be capable of not just decision making but also building emotional relationships. In order to achieve this we will have to invent AGI, but as the gap between AGI and ASI is very narrow, once AGI is invented bringing it into ASI would be a very easy and fast task (Advani, 2021).

2. **Applications of AI in Healthcare**

Complex clinical problems cannot be easily resolved in modern medicine as the challenge to acquire, analyze and apply the large amount of knowledge needed for the solution exist. Healthcare can be enhanced by the application of AI as it will bring about more digitalization, innovation and efficient processes.AI can be applied in two branches: virtual which involves Machine Learning also known as Deep learning, which is represented by mathematical algorithms that improve experience induced learning and the physical branch involves the usage of medical devices and sophisticated robots in the delivery of care. AI is ideal for application in healthcare as it can quickly diagnose diseases, which in turn would help prevent complications that arise during serious stage of such diseases, additionally the duration of the treatment will be shorter and the cost of the treatment will be less. The latest medical information from journals and books can be easily accessed by physicians, in addition a personalized care can be offered to the patient as AI techniques are capable of predicting the human genome and recommending the suitable treatment.

The current applications of AI in healthcare include:

- Electronic medical records where identification of subjects with a family history of a hereditary disease can be done using specific algorithms.
- Outpatient appointment reminders will help ensure an optimal use of resources by the hospital administration.
- Health tracking applications where the wearable feeds the data to the AI engine which uses its machine learning capabilities to detect abnormalities if any in the wearer's body.
- Robotic surgeries which involve the surgeon controlling the robot from a console. A notable example includes Da Vinci surgical system which uses minimally invasive approaches during complex surgeries such as cardiac heart valve repair and gynecologic procedures.
- Robotic drug dispensaries such as nanorobots which are designed to overcome delivery problems such the difficulty of diffusion of the therapeutic agent into a site of interest (Hamet and Tremblay, 2017).

COVID-19 pandemic is global health crisis that hit the healthcare system badly and almost exhausted the resources of some hospitals. During this pandemic AI gained momentum as more

AI-based solutions started emerging in various areas especially in healthcare; where a major application involved the early detection and diagnosis of the infection. AI technology is capable of easily tracking the spread of the COVID-19 virus as it can analyze the level of infection by identifying the clusters and successfully contact tracing the individuals and monitoring them. In addition it helps in the identification of high-risk patients. It can analyze previous data of patients and predict mortality risk. Through the use of algorithms, it is possible to develop a new diagnosis and management system for COVID-19 cases, which will provide faster decision making and will be cost effective. The use of AI helped create a neural network that can be used to assist in monitoring and treatment of the affected patients by extraction of the visual features of the disease. In addition, it can provide daily updates of the patients and solutions to be followed during COVID-19 pandemic. AI can be used to identify the most vulnerable regions, people and countries and carry out the required countermeasures. This pandemic affected health workers adversely and increased their workload, making them overworked and exhausted, their workload can be reduced by the use of AI as it will use digital approaches and decision science in order to help provide treatment at an early stage. Using the available data on COVID-19, AI can help in the development of vaccines and treatments at a faster rate. AI uses real-time data analysis to identify traits, causes and reasons for the spread of infectious diseases, this will aid in the preventative measures taken to fight any other diseases in the future. Currently some hospitals use AI to triage COVID-19 while the Center for Disease Control and Prevention (CDC) uses an AI-driven bot on its website in order in the assist in the screening of COVID-19 infections. Nonetheless AI plays a vital role in improving the planning, treatment and the reported outcomes of the COVID-19 patients (Vaishya *et al*., 2020).

AI techniques currently utilized in healthcare include:

- Fuzzy logic assists in disease diagnosis as it solves complex real-life problems using approximation-based data rather than static and exact data.
- Artificial neural networks (ANNs) are utilized in diagnostics as well as in the detection of physiological changes and visual anomalies in screening program scans due to ANNs being good at discovering and learning patterns in large volume of quantified data.
- Genetic algorithm helps in solving complex medical issues in fields such as oncology and surgery.

- Fuzzy neural is capable of solving problems such as density estimation, regression and pattern recognition when no mathematic model of the problem is provided.
- Particle swarm optimization is a population based stochastic optimization technique, which is applied for detecting critical conditions in a patient.

Deep learning which is also known as deep neural learning or deep neural network is an AI function that copies the working of human brain in processing data and creating patterns for use in decision making. It is applied in the analysis and decision making of different critical health diseases that include cancer, diabetes, obesity and malaria.

Limitations involved in implementing AI in healthcare include:

- Patients feeling uncomfortable with sharing their personal details digitally as sometimes healthcare professionals unintentionally expose patient data in addition to occurrence of cyber-attacks and cybercrimes.
- An inconsistency in data restricts the potential of AI as it relies on digital data.
- AI systems can make errors and this can lead to serious implications in case an error is difficult to detect.
- AI systems can be less accurate and reliable as they are usually trained on comprehensive datasets but they can encounter data and conditions that they have not been trained within the real-world scenario. This would lead to serious consequences as it can put the patient's health at a risk.
- Automation cannot replace humans as the patient value compassion and this attribute is not possessed by the AI system.
- Application of AI techniques can lead to unemployment of healthcare workers.
- Implementation is very costly (Srivastava *et al.*, 2019).

3. Applications of AI in Business

Organizations discern the vitality of AI for efficient and methodical business operations. Globally 90% of companies invest on AI projects that ultimately cuts down the costs on lengthy manual tasks which would have done by humans instead. Therefore, this additionally saves the time and cost as well. Most of the processes of AI in business today contemplate regarding machine learning and many customers facing organizations use AI to extract insights of their

customers and business. Number of execution challenges arises when AI opens opportunities for exciting possibilities over the industries. Business leaders tend to overlook in major limitations of AI use as follows:

- Data- Models need to be practiced on data in order to accomplish its tasks. Data whips up few obstacles such as adoption to data, lacking of data and surviving within the data standards and regulations of company parameters (Shishir, 2020)(Bayern, 2018).
- Lack of knowledge-There is no guarantee that AI would understand all the data because; technologies and machines often do not understand what they do not know (Bayern, 2018).

Banks have adopted AI based technologies to offer a better customer service including effectively detecting abnormalities or irregularities and credit card frauds by tracing card usage and end-point access. Banks have developed chatbots which have the ability of handling millions of inquiries, conversations, collect data and knowledge and generate simple answers within even less than 0.4 seconds. Financial organizations analyze increase their stock trading performances and boost up their profits using AI-based systems. By using AI, many businesses reduce operational cost, increase efficiency, grow revenue and improve customer experience. To reach the peak of benefits, business leaders consider engaging the full operations (machine learning, natural language processing etc.)(nibusinessinfo.co.uk, 2018).

AI impact on business by utilizing properly, a business may acquire,

- Saving operation cost and time cost by optimizing routine processes and tasks while increasing productivity and operational efficiency.
- Making faster business decisions depending on the results of the perceptive technologies.
- Avoiding mistakes and "human errors" since AI systems are programmed properly and apply previously gathered information to make a certain set of algorithms (Kumar, 2019).
- Using previous records and insights to predict customer preferences and provides them a better, user friendly and personalized environment and experience.
- Referring to a large amount of data to generate quality leads and grow customer base.
- Increasing profits by recognizing and growing sales opportunities.

- Enabling analysis, offering intelligent advice and support and grow expertise in the business.
- Availability of 24x7 services without a break leads to expanding the customer base by in taking inquiries and issues and handling them effectively (Kumar, 2019).
- Helping in the repetitive work such as thanking emails, identifying errors and verifying identities and documents. And also, by implementing a chatbot as digital assistance; can provide a healthy customer service either to solve frequently asked questions or until a human operator gets back to the help center (Kumar, 2019).

As every bright side has a darker version of it, AI also has the following challenges:

- Since AI is updating every day, the hardware and software have to be up-to-date to meet the newest requirements. Repairing and maintaining cost varies in order to the complexity of the machine.
- When AI starts replacing the majority of the repetitive tasks with robots, human interference becomes less. Therefore, companies only recruit individuals who are qualified and have potential working in a similar capacity and efficiency that AI robots do and the individuals who cannot be replaced with AI, such as computer system analysts, writers and chief executive officers etc.,(Priya, 2020).
- Even though machines perform efficiently and productively, they cannot reach the human teamwork, management and human intelligence because machines cannot build the bond that humans do as a team since machines do not have emotions or moral values (IMS Proschool, 2018).
- Machines only perform what they have been designed and programmed for. Therefore, there would not be innovations, out of the box thinking and that will cause for backdrops when unexpected, irrelevant or critical situation arises (Kumar, 2019).

4. Discussion

During the current global health crisis, practices such as social distancing and remote working are becoming a major part of the new normal. Many challenges can be experienced in order to retain quality and efficiency that was present prior to the pandemic, AI comes into play, as its application in various fields have shown to reap good results.

Many people are very apprehensive in regards of emerging uses of AI; this can be attributed to the misconceptions that people gain when they watch fictional movies that showcase an apocalyptic world where the humankind are dominated by AI. In addition there are few people who actually understand AI and majority who have only book knowledge, thus it is vital that more awareness campaigns be carried out in order to educate the masses about AI. Rules and regulations must be set clearly to ensure that AI is utilized safely and no misuse takes place.

5. Conclusion

The world is changing along with advancements in technology. Concepts that were a mere science fiction only a couple of decades ago are now a part of our present world. AI has and continues to have a huge impact on our lives and it is here to stay. Nowadays many applications of AI are observed in many industries during this ongoing COVID-19 pandemic and AI has shown potential to aid humanity in the fight against COVID-19 virus. Despite the limitations associated with AI more in-depth research is required in order to contribute to the development of AI and its application successfully and beneficially.

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