The Universal Artificial Intelligence Efforts to Face Coronavirus COVID-19

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Abstract

Artificial intelligence (AI) has already changed the world and has made an effective impact in a range of fields including industry, criminal law, health, national security, transport, nanotechnology, intelligent cities as well as issues such as algorithms and access to the data. This paper shows how these technologies are a great asset to humans and are programmed to reduce human effort as much as possible. They tend to possess the capability to work in an automated fashion. Therefore, manual intervention is the last thing that could be asked for or seen while operating parts associated with this technology. As well as the paper shows the different universal efforts of AI techniques to face the pandemic of COVID-19.

Keywords: Artificial Intelligence Techniques, COVID19.

1. INTRODUCTION

Although the concept of Artificial Intelligence (AI) has long existed, many researchers believe that it is time for AI to be a reality. Computer science refers to AI research as a "Smart Agents" study: any system which sees and acts in a way that maximizes its opportunities to meet its goals [1]. In 1950, Claude Shannon proposed the concept of computers playing chess. In the early 1960s, AI began. Marvin Minsky believed "the problem of AI simulation is going to be solved within a decade". The first AI applications were introduced during that period. In [2] discussed various ideas on humanoid robots were put into practice in antiquity Greek times. Daedelus, who controlled wind mythology and tried to create artificial people, is an example. Modern AI has begun to be used in history to explain the philosopher's model of human thinking. However, Using AI not only engaged with engineering, information technology, finance, and accounting,

medicinal, marketing, agriculture, human resource management, law, education, sciences of space, customer services but also contribute greatly to the performance of tasks effectively [3].

It is important to facilitate our lives. This paper shows how these technologies are a great asset for humans and are designed as much as possible to reduce human effort. They tend to be able to work in an automated way. The last thing that could be requested or seen in the operating parts associated with this technology is therefore manual intervention.

2. WHAT IS AI?

Much research defined AI in varies ways. The ability of a system to interpret external data accurately, learn about it and use it to achieve specific objectives and tasks through various changes is one of the most common meanings of AI's concepts [1]. Another definition, AI is an analytical computer assisted course that seeks to shape automated systems which could be referred to as smart systems [4]. Moreover, [4] defined AI as the machine-shaped human intelligence. AI is an attempt to create smart entities which can equal or surpass human intelligence and rationality [5]. "The science of making machinery does what, if done by men, would necessitate intelligence [6]. John McCarthy say that logical reasoning is a "standard" more influential than human capacity to quantify intelligence [7]. This approach to AI uses mathematical logic approaches to officialize the complex tasks artificial intelligence machines perform.

3. THE CHARACTERISTICS OF AI

According to [8], as shown in Fig. 1, the most important characteristics for AI are:

- *Deep Learning:* A machinery that teaches computers to learn by example what naturally happens to humans. There are many areas of AI technology, such as autonomous vehicles, computer vision, automatic text generation, and the like, where deep learning is increasing in scope and use.

- *Facial Recognition:* Facial recognition enabled individual faces to be recognized by means of biometric mapping. The progress made in surveillance technologies has been path breaking. The knowledge is compared to a database of known faces to find a match.

- *Automate Simple and Repetitive Tasks:* Without breaking a sweat, AI could do the same work repeatedly. For example, Siri, an Apple Inc. voice assistant. In a single day, it can

handle so many orders. Automation would not only increase efficiencies but would also lead to lower overhead costs and a safer working environment in some circumstances.

- *Data Ingestion*: Data ingestion means that knowledge is transported from different sources to a data storage medium where a company frequently accesses, uses, and analyzes it. AI analyzes a large number of these data with the help of neural networks and contributes to a logical conclusion from it.

- *Chatbots:* Chatbots are software that provides a window with either audio or textual input to solve customer problems. Before bots, only certain commands were used to respond. It did not know what you meant if you said the wrong thing. Now when you are talking to the chatbot you do not have to be ridiculously specific. It knows not just commands but language. The chatbots not only provide services focused on problems faced by customers, but also provide users with product suggestions. That is all due to AI alone.

- *Quantum Computing:* The field focuses on the creation of quantum algorithms for computer-based work within AI, such as machine learning. It is an interdisciplinary field.

- *Cloud Computing:* Data storage would have been a serious problem if such a large number of information had been channeled every day. Capabilities AI's work in the cloud-based enterprises to make organizations more efficient, strategic, and insight-oriented.

4. AI TECHNIQUES

Fig. 1. Characteristics of AI

The positive impact of AI reaches almost every dimension of human life. AI was applied for several models, forecasts, and decision support and control systems in such diverse fields as engineering, economics, linguistics, law, manufacturing, and medicine [8-9]. The following are examples for how AI techniques are taking part in different fields of life:

A. Applying AI Techniques in Finance Filed

The financial services industry includes AI for massive processing of data, trading, online communication with clients and performing a variety of other essential functions. In [10] carried out a study to search for AI's effect on the real world, on finance, which has been of significant benefit to many financial sectors from the implementation of AI applications. He concluded that AI technology would increase efficiencies, lower costs, enhance efficiency, boost customer satisfaction levels, and encourage financial inclusion in the provision of financial services. There are many researches which presented the benefits of using AI in finance [11-14].

B. Applying AI Techniques in Human Resource Filed

In [45] explained that although the effectiveness of using AI in Human Resource (HR) practice, most organizations continue to be lagging in integrating AI with HR practices due to their integration costs or are afraid that some business processes may be handled by a non-human entity. Moreover, other researchers presented how AI is effective tool in HR [15-16].

C. Applying AI Techniques in Civil Engineering Filed

In the field of adaptive civil engineering systems, [2] have made progress. In an active tensegrity system control setting, self-diagnosis, multi-target type management and enhancement learning processes have been introduced. It is Specifically suitable for modeling complex systems with known input-output data sets among AI computer technologies. The modeling of cement-based materials can be efficient, non-linear, complex, and unambiguous using single, dual, or multiple damage factors. Many other researchers made development in that field [16-19].

D. Applying AI Techniques in Healthcare Filed

AI is already used effectively in the field of health care, ranging from online appointments planning to online checks, follow-up appointments calls for reminders, diagnosis of the aid for diseases, assistance with procedures of surgery, radiation treatment and offering mental health therapy [20-21]. Japan has the leadership in using of AI technology in health care. It has already introduced AI robots helping geriatric people to workday by day, from taking morning pills to adjusting the AC temperature during bedtime. It is also useful in the diagnosis of Glaucoma [22]. In China, a primary method for early diagnosis of COVID-19 was AI-powered CT scanning of the lungs, reducing the time spent on diagnosing a case from 30 minutes to seconds. The branch that has been the most up-to-date and welcoming to the use of new technology in clinical imaging and storage is radiology. By identifying rapid negative tests in computed tomography, X-rays, magnetic resonance imaging, particularly in high volume settings, and in hospitals with less available human resources, AI could provide substantial support in radiology [20]. Currently, three South Korean medical institutions, Gachon University Gil Medical Center, Pusan National University Hospital and Konyang University Hospital, have introduced IBM's Watson for Oncology artificial intelligence system that can identify, evaluate and compare treatment options by understanding the medical record and applying its training to each individual patient [23].

E. Applying AI Techniques in Marketing Filed

In [24] showed that implementing AI is useful for future marketing strategy growth. AI is a tool for digital marketers to inspire them and tricks you to get the brand or an individual or group of people to learn it and make it high. It is fair to assume that AI is a secure investment that earns dividends [25]. To convert digital systems into all sectors that contribute to technological progress that will help in economic development, AI technology is a goal for Saudi Arabia during the current period of its [26] initiative to be one of the leading countries in Middle East in implementing and investing of AI applications for the sake of society and individuals [27].

F. *AI Techniques in Wastewater Treatment Field*

There are many studies covered the effective role of the importance of technological advancement such as AI techniques in the chemical analysis and wastewater treatment. [28] stated in their study the importance of AI technologies in treatment processes of the effluent discharge from hospitals that has an eminent quantity of chemical waste. [29] covered some aspects of the worldwide disposal and regulatory standard for hospital effluent discharge, its managements and treatment technologies that are widely implemented and perfectly suited. To treat 10m3/day of hospital wastewater, a pilot scale CW system was used. The system was tested for 3 months to assess its efficiency in wastewater removal. With all removal efficiency 94% (COD), MLSS (97%), TSS (98%), BOD5 (96%), Phosphate (98%), HSFCW coupled with a tube settler (79 %) [30].

G. *AI techniques in Nanotechnology Field*

[31] also discussed the fact that since the 1994 development of nanotechnology, developed countries have sought the use

of modern technologies in all fields, including water purification, in their study entitled "Water and Wastewater Treatment using nanotechnology. There were positive results compared to other water treatment techniques because of their high surface area (superface/volume ratio), metal containing nanoparticles, carbonaceous nanomaterials, zeolites and dendrimers and nanofibers. In their paper, [32] discussed a few recently used nanomaterials that are currently used in water treatment, with an emphasis on nano-based adsorbents and filtration membranes.

5. SCOPE OF AI IN THE MIDDLE EAST BEYOND 2030

The scope will almost certainly increase after 2030, when AI affects the economy and society. The complexity of AI would almost certainly grow both in the economy and in society. Therefore, to provide a springboard for the future it is necessary for the Middle East to be strategically positioned. The most significant gains, which are equivalent to 12.4% of GDP, are expected, in absolute terms. AI in Saudi Arabia is contributing over USD 135,2,2 billion to the economy by 2030. The UAE is projected to have a significant effect in comparison with approximately 14% of GDP in 2030. As well as the expected annual contribution growth for Bahrain, Kuwait, Oman, and Qatar is 14% of GDP [33].

6. CONTRIBUTION OF AI TO GROSS DOMESTIC PRODUCT (GDP) BY 2030

The International Data Corporation (IDC) analysis estimates that the Middle East and Africa (MEA), cognitive and AI system expenditure will grow from 37,5 million dollars in 2017 to over 100 million dollars in 2021, which is a 32 % increase yearly [33].

7. THE DEVELOPMENT OF AI TECHNIQUES IN THE DEVELOPED COUNTRIES

Innovative intelligent manufacturing strategies and policies have been formulated by developed countries, such as the United States and Germany, using AI, such as the Advanced Manufacturing Partnership Plan (2011) and the Industrial Internet (2012) in the United States and the Industry 4.0 Plan (2013) in Germany. The 'Industrial Internet' was adopted by the U.S., which can intelligently analyze intelligent equipment, employees, and data in an intelligent way to make smarter decisions possible. This achieved such a good result. Significant results have been achieved by CPS-based smart manufacturing technology in Germany, e.g., in Germany The Amberg plant is a smart plant model of the Siemens company. The real factory is run together with the virtual factory at Amberg, and the real factory data and production environments are reflected by the virtual factory through which individuals can manage and control the real factory. Almost 75% of the manufacturing operations have been automated. In robotics, autonomous vehicles, and quantum computing, Germany also has leadership [34]. Chinese scholars have built various types of AI models in China to predict the consumption of petroleum. The large amount of data in the financial market could be used for analysis by artificial intelligent algorithms [35]. According to an online survey of students conducted at Canadian medical schools, as well as in Canada, they expect to add AI to the curriculum as a complement to radiology [36].

8. UNIVERSAL AI EFFORTS TO FACE CORONAVIRUS COVID-19

Medical image processing, which has recently appeared in several coronavirus research studies, has been using AI techniques as a fundamental function for COVID-19 detection. [37] for other uses of the DL in medical image analysis. It is recognized from these studies that X-ray images and computed tomography (CT) scans are commonly used to automatically detect the infected case of COVID-19 as a DL model input. A deep convolutionary neural network (CNN) model was developed for the detection of COVID-19 cases in [38]. The proposed CNN model can

achieve an accuracy of 93.3 percent by practicing 13,975 images of 13,870 patients on an open-source dataset [39-44] considered the use of ML and DL techniques for COVID-19 detection with chest CT scans. These works show high performance as they can achieve a high classification accuracy, e.g., 99.68% in [45], an area under curve (AUC) score of 0.994 in [43], AUC of 0.996 in [45], and 82.9% accuracy (98.27%) with 80.5% accuracy (97.60%) and 84% sensitivity (98.93%) in [43-44].

A. *Apple and Google Team Up to " Contact Trace" COVID-19*

Apple and Google have been creating mobile applications that tell users whether they are linked to someone who has recently been infected. The group plans to team up in a few months to deliver the product, which is built into billions of iPhones and Android devices worldwide. That would permit smartphones to log in to other devices they come near, enabling the so-called touch tracking of the disease, and these have succeeded in areas such as South Korea, where mass virus tests have been carried out [45].

B. *Speeding Up Drug Discovery and Development*

AI can enable new drugs and vaccines to be detected, develop, and measured faster than ever. For instance, Insilco Medicine, a portfolio company of Longevity Vision Fund, was able to use its AI techniques for successfully recognizing thousands of molecules in just four days for possible medications. Insilco Medicine then launched an open policy and published the updated results on its website to allow all researchers to download the data free of charge, ultimately contributing to the global fight against the epidemic [45].

C. *Reducing Fatality and Optimize Disease Management*

Applying AI techniques can help in controlling the epidemic and reduce deaths by reducing the burden on healthcare workers and by reminding patients of correct treatment procedures. Medical care staff members are at high risk of exposure and contraction to Covid-19. Until now, Covid-19 has infected thousands of Medical care staff members in China as well as many other countries. AI can help to alleviate the burden. For instance, China uses robots to provide faster diagnostic tests. Also, AI assists Hangzhou City Ambulances to speed up traffic.

Moreover, AI can also help people to better understand what their reactions should be in case they affected with the virus. China has released an App that lets people verify whether a confirmed COVID-19 patient has taken a flight or a train. Moreover, it is using drones to ensure adequate measures are taken by the residents [45].

D. *Forecasting Epidemics*

Applying AI techniques can alert from an impending outbreak and give people ample time to plan for it. To evaluate information from a variety of sources and monitor over a hundred infectious diseases, BlueDot, a global AI software company, uses AI-powered algorithms, machine learning, and natural language processing. In the coming days, it is expected that AI could even use social media data to predict human actions and possible outbreaks [45].

CONCLUSION

Artificial intelligence is known for a long time now for its importance and its subsequent components. They are seen to make this world a better place as instruments and techniques.

These machines tend to speed up your processes and tasks with a guaranteed degree of accuracy, making them an important and useful tool.

These technologies and applications are not only related to our overall and everyday life, in addition to making the world an error free place with their simple and daily techniques.

It also affects and is important for other areas too.

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