iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 8 **Issue:** VII **Month of publication:** July 2020

DOI: http://doi.org/10.22214/ijraset.2020.7004

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.429
Volume 8 Issue VII July 2020- Available at www.ijraset.com

AI-A Shield against COVID-19

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Abstract: ***COVID-19 has hit the world both in terms of economy and healthcare being overwhelmed and AI could emerge as an influential technology to fight this pandemic. Current use of Artificial Intelligence technology includes NLP, ML along with Computer Vision to develop the devices for utilizing big data frameworks in recognizing description, designs and forecasting. For efficient diagnosis based on recognition, accurate prediction and explanation or the medication for the virus to assist in societal commercial effects, this technology plays a vital role. A major shift for investment in Artificial Intelligence is being encouraged during these times of the pandemic which provides support in medicine industry. Because of these vital uses it is encouraged to develop Artificial Intelligence, this review paper is based on intensive discussion of AI powered medical technologies to combat this deadly virus. This will certainly be a big boost for both the present which is highly daunting as well as for a hopeful prospective practical application with proper methodological analysis. In the end, on a positive and a hopeful note we finish the paper discussing various advantages and challenges.***

Keyword: AI, Covid-19, Vaccine, Medicine

I. INTRODUCTION

The novel coronavirus SARS-CoV-2 is a major pandemic that emerged in China which changed the world as the deadly virus expanded its infections throughout the globe [1]. This caused widespread public health danger in society, as WHO announced the epidemic as a PHEIC on 30th Jan,2020 and was acknowledged it with the declaration of it being as a pandemic on 11th Mar,2020 [2,3]. The infection is speedily increasing as more and more people are being infected by COVID-19.

This virus is an enclosed, single stranded big Ribo Nucleic Acid viruses which infects human beings and a large variety of animals. It was initially depicted at 1966 where the virus propagated from victims via common cold [4]. As the virus is observed under a microscope it looks like a crown like formation hence it was referred by the name of “coronavirus” (latin word). It has a vast family which may lead to common cold and some are emerged via camels, bats, pangolins and variety of other animals have become serious disease like SARS and MERS virus. There has been a major shift of the mindset as far as World Health Organization is concerned, as it is accumulating the current worldwide multi-language technical discoveries on Coronavirus Disease of 2019. The worldwide writing records quoted in the World Health Organization’s Coronavirus Disease of 2019 collected data is being regularly revised from the searched data record collections and the addition of varied specialist-referred scientific articles. This data accumulation signifies a comprehensive multi-language origin of present literature on the issue. Even though the current work is not stagnant new research work is continuing its gradual flow [5]. Artificial Intelligence is also utilized in automated identification with the eviction of disinformation based on the infection in social media platforms that provides with better accuracy along with a timed Computed Tomography scanning to detect the infection spread, three dimensional printing produces gadgets necessary for comprehensive healthcare, developing precise drug trials and prospective vaccines. AI is a technology on rise especially in the medical imaging area which has involved itself strongly to combat COVID-19 [6]. AI provides a safer, more accurate and highly effective imaging solutions which solves the problem of conventional imaging system which is highly dependent on man labor. Latest Artificial Intelligence based applications against COVID-19 broadly contains the devoted imaging platform, lung along with contaminated region segmentation, analytic evaluation with proper diagnosis, as well as the pioneering basic and clinical research. It is imperative to merge imaging of information provide with scientific reasoning along with laboratory exam outcome to assist screening, identification and analyzing the diagnosis process in Coronavirus Disease 2019. AI has been encouraged as the pandemic is spreading quickly [7]. It is predicted that Artificial Intelligence would indicate its strength in combining multiple source information, to accurately and efficiently perform with proper analyzation.

II. AI CONTRIBUTION TO COVID-19

Primitive disturbances like Covid-19 will emphasize to even provide importance to an algorithm which wouldn’t have been a necessity in the past [8]. During this health calamity pandemic, the medical business is aiming for latest mechanisms to detect and restrict the escalation of COVID- 19 disease. Artificial Intelligence is a technology that may simply track the escalation of this infection, marks the highest-vulnerable victims and is vital in reducing this virus.

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The threat of fatality can be predicted with the help of appropriate analyzation of preceding information of patients. Artificial Intelligence will assist us to combat this infection using medical assistance, population screening, notification, and recommendations about the reduction of the virus. AI has the capability to refine the preparation, medication and announced results of patient, used like an medical tools dependent on confirmations depicts the common process of Artificial Intelligence and non-Artificial Intelligence dependent applications which assist the doctors to find the symptoms of the virus. AI can battle this virus in various areas like preliminary cautioning's with alerts, proper follow up and forecast, identification and prognostication, medications, rehabilitations, social restriction.

A. Preliminary Cautioning with Alerts

This review is based on the current and future Artificial Intelligence model which would have the capability of forecasting asymptomatic and the sensitive or critical patients [9]. Artificial Intelligence by fast analysis of asymmetrical manifestation and hence alarming the victims along with the healthcare authority [10,11]. This method provides with a quicker analysis, that is a cost-effective method. It assists in developing a modern analysis and management structure to prevent the rising COVID 19 infections by using practical algorithms. Artificial Intelligence is useful in the detection of patients infected through medical imaging mechanization with the help of MRI and CT examination of the various body components of people.

The case study of BlueDot[12], is a great source of inspiration. It proves that a cheap Artificial Intelligence device may out-perform human beings in detecting contagious disease spreads. Using BlueDot, human beings abide to centrally in assessing and understanding its result, as described by the founder himself [13]. Hence it is imperative to put added emphasis on optimizing applications using Artificial Intelligence in place of human input in all the disciplines.

B. Tracking

COVID-19 has made Artificial Intelligence a key medium with its involvement in health care and bringing with it opportunities on one hand and dangers on the other. Health workers and health care facilities are being stretched as different future technologies are slowly emerging. This procedure could enable devices which would skirt across regulatory procedures which would harm the victims dearly [14]. With the help of AI we may track and predict the behavior of virus using the accessible information, public network and social media, to get to know about the threats surrounding the contamination and its likelihood of escalation. In addition, it will forecast the total COVID-19 positive cases, fatalities in an area. Artificial Intelligence will assist to locate the highly sensitive areas, human being and nations and execute a responsible decisions. AI would forecast about the disease and how it will escalate with space and time. Consider a case study of the Zika virus in 2015 shows that with the help of effective neural network the spread got predicted. This shows how AI has been historically effective in combating COVID-19.

C. Analysis and Prediction

AI provides with a vast potential to increase the part in chest imaging for Coronavirus Disease of 2019 beyond detection providing has the potential to expand the role of chest imaging in COVID-19 beyond diagnosis to enable possible stratification, monitoring medication and findings of healing targets [15]. Quick and precise analysis of COVID-19 would rescue humanity, isolate the escalation of the infection, and develop the information on how to instruct the Artificial Intelligence prototype. Artificial Intelligence would supply important code in this concern. Based on the latest analysis of Artificial Intelligence uses versus COVID-19 [16]. Analysis shows that Artificial Intelligence will be more precise than human analysis, would preserve time and functions a quicker and an inexpensive method comparing to the normal tests of COVID-19. It has been suggested that with the help of cellphones we may take computed tomography images [17]. Artificial intelligence (AI), an emerging technology in the field of medical imaging, has contributed actively to fight COVID-19 [18]. Compared to the traditional imaging workflow that heavily relies on the human labors, AI enables more safe, accurate and efficient imaging solutions [19].

D. Precaution of the illness

AI technology with algorithmic analyzation and tools which assist in visualizing information for always being two steps in front of the virus. They have the prospect of predicting the location of the coming or future diseases, along with being able to find medicines which would prove vital in this fight against the pandemic [20]. Using real-time information inspection, Artificial Intelligence provides modernized data that is useful in the precaution of the illness. It would forecast the expected areas of contamination, the spread of the infection, requirement of beds along with the health workers amidst this pandemic. Artificial Intelligence is useful for the coming viruses and precaution of illnesses, using past calculated data of varied period.

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It locates the behaviors, grounds for the escalation of contamination. It has a great potential to combat the current and the coming epidemics, pandemics. It assists to supply a precaution measure, to combat with various illnesses. AI would be a game changer to provide with a better anticipative healthcare.

E. Evolution in Medicines and Vaccines

Artificial Intelligence stands tall in providing a prospective solution but improved qualitative data collection is necessary [21]. Artificial Intelligence is utilized in medical research by evaluating the accessible information on COVID-19. AI is vital for medicine delivery plan and improvement. This technology is useful for quick drug trials on the contrary normal trials take a lot of time and so the normal procedure would not be feasible [22,23]. AI is beneficial to make efficient medicines for medicating COVID-19 victims. AI has the potential to be an enormous technology to assist in symptomatic test plan and improvements in the vaccine [24]. This technology evolves both the medication and vaccines in a quick pace with assistance of trials in times of evolution of vaccine.

F. Medications and Restorations

Utilizing Benevolent Artificial Intelligence in finding acceptable medicines which would assist and concentrate on isolating the infectious virus [25]. Before the pandemic spread, Artificial Intelligence was hailed for its capability to supply the latest medicine invention, we use Monte Carlo tree search and symbolic artificial intelligence (AI) to discover retrosynthetic routes [26]. see e.g. Coldeway (2019); Fleming (2018); Segler et al. (2018) and Smith (2018). During the pandemic, A large quantity of testing laboratories and data centers have already recommended engaging Artificial Intelligence to look for medications along with vaccine versus the pandemic. Artificial Intelligence ascends the procedures of finding latest medicines alongside for recovering current medicines. Google's DeepMind, contains AlphaGo which is a game-play design[27] utilizes Artificial Intelligence to forecast the composition of proteins for the infection data which would be vital in evolving modern medicines. But DeepMind's [28] emphasizes that the forecast of the compositions is not proved experimentally. There isn't a high certainty in the accuracy of compositions that are provided". Atazanavir a present current medicine as reported by Beck with the help of ML might have a great prospect for the medication of COVID-19 [29].

G. Community Distancing

Community alert structure utilizes present Internet Protocol cameras and Closed-circuit television cameras with System vision to identify whether a person is following community distancing guidelines or not [30]. Because of limited past training data it is difficult to forecast and perform treatment with the help of Artificial Intelligence. Hence it is a big challenge to conquer diseases like COVID-19 in the future with AI having limited data for analysis for community distancing but is the desperate need of the hour.

III. ANTICIPATING CHALLENGES FOR AI

Using Artificial Intelligence technology, body x-radiations would be easily studied using algorithms that is a certain prospective hope for the future and has to be encouraged but realistic assumptions for the future is needed [31]. In Google Flu Trends, the cons of big data and Artificial Intelligence against the spread of infections are represented [32] are still authentic. In this two problems are explored which resulted in GFT's errors hubris in big data along with dynamic algorithm and provide guidelines to go forward in the world of big data [33]. Availability of a vaccine in the coming forthcoming is grim. Due to the process of medication and technological inspection, successions and maintains that requirement for execution before the process of drug approval, as and when they are pinpointed, monitoring takes a lot of time. Artificial Intelligence usage is restrained with both limited data in some data and exceeding data in others. Standard Artificial Intelligence is hindered by lack of data, limited open collection of data with prospective complications of big data, static algorithms with a deviated information and a ocean of experimental calculations, that is necessary to be deviated and calculated prior to be providing concise symptomatic along with medication alternatives. For improving current model and datasets in view of the people, data flexibility ways with model allocation by open storages is required. Global storages with anonymous clinical information, containing victims past record and medical imaging is essential to produce and exchange data between scientific organizations. Due to prospective privacy and human rights violation danger looming, Artificial Intelligence with proper monitoring is not whole heartedly encouraged [34]. To enhance the power of Artificial Intelligence improved collaboration, integrated research, enhanced data sharing is essential. Addition of latest data is the need of the hour to combat the disease. For normalization of both human lives and global economy is concerned, effective diagnostic testing and tracking, monitoring and isolating the patients is important. Till now, a vital increase in the current shared data collection is a glimmer of hope to fight the epidemic otherwise we shouldn't expect wonders with the Artificial Intelligence and the big data partnership in combating the virus.

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IV. CONCLUSION

Artificial Intelligence technology has to be used with complete accuracy and efficiency to combat not just this pandemic but also provide key assistance for the future ones as the world of viruses keeps on evolving with time. Investment in health department has to be increased and encouraged even more both by private and government organizations to avoid the current stages of hospitals being overwhelmed with rising infections and cases otherwise we will loose a high number of the sensitive groups with these types of infectious diseases. Artificial Intelligence models requires an impartial dataset. Rise in the global contributions is truly inspiring in this period of heartbreak, but the need of the hour is rampant testing. It is necessary for both dataset management for functioning Artificial Intelligence models and also to controlling the pandemic and protecting both lives and economy.

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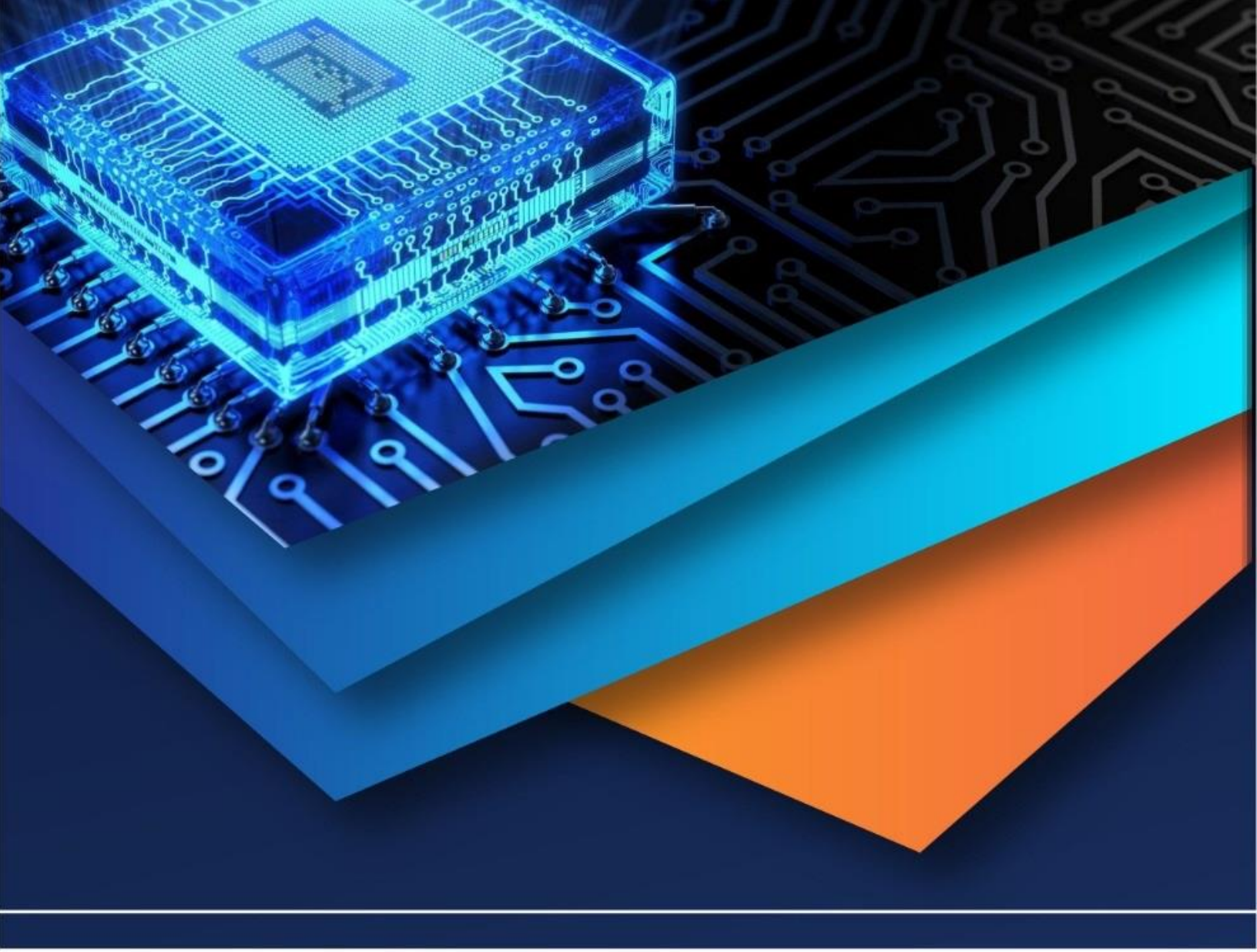

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