

Diagnosing COVID-19 Using Graphical User Interface: A Deep Learning Approach

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ABSTRACT_The COVID-19 pandemic has thrown the world into an unprecedented state of chaos, halting travel and claiming the lives of tens of thousands of people. COVID-19 continues to pose a serious hazard to public health. The infection can be fought using AI, according to this article (AI). It has been shown that Generative Adversarial Networks (GANs) can be used to achieve this purpose (GAN).. These platforms make it easy for doctors and researchers to access information from a wide range of sources, both structured and unstructured, using an integrated bioinformatics approach. Artificial Intelligence (AI) technologies can help speed up diagnosis and therapy for COVID-19. There were a lot of medical reports analysed for the aim of selecting inputs and targets for an Artificial Neural Network-based tool for COVID-19 difficulties. In addition, this platform's inputs include numerous data types, such as clinical data and medical imaging, that can increase the performance of the introduced technique toward the best results in practical applications.

1.INTRODUCTION

The COVID-19 respiratory pandemic was started in December 2019 by the novel coronavirus known as SARS-CoV-2. COVID-19 proven to be a difficult sickness that can manifest in a variety of forms and levels of severity ranging from moderate to severe with the risk of organ failure and death. everything from a little, self-limiting respiratory infection to a serious, progressive pneumonia, multiorgan failure, and death. There are good grounds to be extremely concerned about the effects of this viral infection given the progression of the pandemic, the rising number of verified cases, and the individuals who suffer from severe respiratory failure and cardiovascular problems.

There has been a lot of focus on choosing the best strategies to address the issues associated to COVID-19. However, the ever-increasing volume of data, also known

as big data, that challenges researchers and decision-makers in the process of combating the virus, is a significant difficulty as well. This explains how and to what extent Artificial Intelligence (AI) could be important for creating and improving global health care systems. Recently, more study has been put into using AI to address complicated problems in a variety of disciplines, including engineering, medicine, economics, and psychology.

Therefore, in a situation this critical, it is necessary to mobilise and save human, logistical, and medical resources, and AI can not only help with that, but it can also save time at a time when even one hour of the time saved could result in saving lives in all the places where the Coronavirus is killing people. With AI's increasing use in clinical settings, it can help decrease the amount of unintended deletions while also enhancing productivity and efficiency in research involving big samples and aiming for better levels of prediction and diagnosis accuracy. Any country can benefit from using big data to facilitate viral activity modelling research. The data analyses allow health care officials to shield their nation from the making informed decisions and preventing the disease's outbreak.

However, despite the fact that treatment plans, crisis management, optimization, and improvement diagnosis methods, such as medical imaging and image processing techniques, could benefit from AI, which is capable of assisting medical methods, it has not been desirable employed and well-appropriated to support health-care systems in their battles against COVID-19. For instance, image-based medical diagnosis, which enables quick and precise diagnosis of COVID-19 and potentially saves lives, can benefit particularly from the beneficial input of AI. The gap between AI-based techniques and medical approaches and treatments can be filled by utilising AI techniques to address COVID-19-related concerns. The usage of AI platforms by specialists in the field can facilitate the creation of connections between various aspects and accelerate the procedures to achieve the best outcomes.

This study draws on the most recent research on COVID-19 and its problems in order to make generalisations and recommend a range of approaches that are applicable to high-risk groups, epidemiology, radiography, and other fields. The study analyses and discusses the possibility of AI methods to address COVID-19-related difficulties as it progresses.

2.LITERATURE SURVEY

- 1. World Health Organization (WHO), Coronavirus disease 2019 (COVID-19) Situation Report-74. <https://www.who.int/docs/defaultsource/coronaviruse/situation-reports/20200403-sitrep-74-covid-19-mp.pdf>. Accessed 1 Sept 2020**

In Wuhan City, Hubei province, China, pneumonia cases reached a historic level with no known cause in December 2019. The World Health Organization later designated the causal agent as a new coronavirus and named it COVID-19 (WHO). A betacoronavirus called SARS-CoV-2 that affects the lower respiratory tract and causes pneumonia in humans is thought to be the source of COVID-19, which is regarded as a related of severe acute respiratory syndrome (SARS) and Middle East respiratory disease (MERS). With 90,870 laboratory-confirmed cases and more than 3,000 fatalities worldwide, COVID-19 is still on the increase despite intensive containment and quarantine measures taken on a global scale. We provide a summary of the present state of knowledge regarding COVID-19 in response to this widespread outbreak.

- 2. The novel coronavirus Reyad O (2020) A Situation Report on the COVID-19 Strike on Arab Countries and Territories ArXiv:2003.09501, I [cs.CY]**

The novel Coronavirus (COVID-19), also known as 2019-nCoV, is a contagious illness brought on by a brand-new virus that was initially discovered in Wuhan, China. The condition results in a respiratory illness (like the flu) and other symptoms include a cough, fever, and in more severe cases, breathing difficulties. This novel coronavirus appears to be very contagious and has spread rapidly over the world. This article provides information on COVID-19 and presents the COVID-19 striking situation in Arab countries and territories. The main expectations for the upcoming weeks are also provided.

- 3. American College of Radiology recommendations for the use of chest radiography and computed tomography (CT) for suspected COVID-19 infection (2020). Recommendations-for-Chest-Radiography-and-CT-for-Suspected-COVID19-Infection may be found at <https://www.acr.org/Advocacy-and-Economics/ACR-Position-Statements/>. As of 9 September 2020**

The relevance and suitability of chest radiographs (CXR) and computed tomography (CT) for the screening, diagnosis, and therapy of patients with suspected or known COVID-19 infection are topics of increasing concern as COVID-19 spreads throughout the United States. A growing number of articles documenting the CXR and CT appearance in the context of known or suspected COVID-19 infection, worry about test sensitivity from prior reports in China, and the limited availability of viral testing kits to date are all factors contributing to this interest.

Most radiologic data currently comes from China. According to several research, a chest CT in particular may be positive after a negative test. We wish to underline that understanding of this novel disorder is fast advancing, and not all of the information published and made publicly accessible is accurate or current.

3.PROPOSED SYSTEM

The paper draws on the most recent research on COVID-19 and its problems in order to make generalisations and recommend a range of approaches that are applicable to high-risk groups, epidemiology, radiography, and other fields.

Additionally, it is shown that using the impacts of human respiratory secretions on the human airway coupled with the outcomes of transmission electron microscopy, it is possible to visualise and detect new human Coronavirus. Microscope and culture supernatant genome sequencing.

The Generative Adversarial Network and the proposed neural network model (GAN). The feature extraction technique can be used to evaluate images taken using an electron microscope. A specific kind of neural network model called GANs performs discriminating.

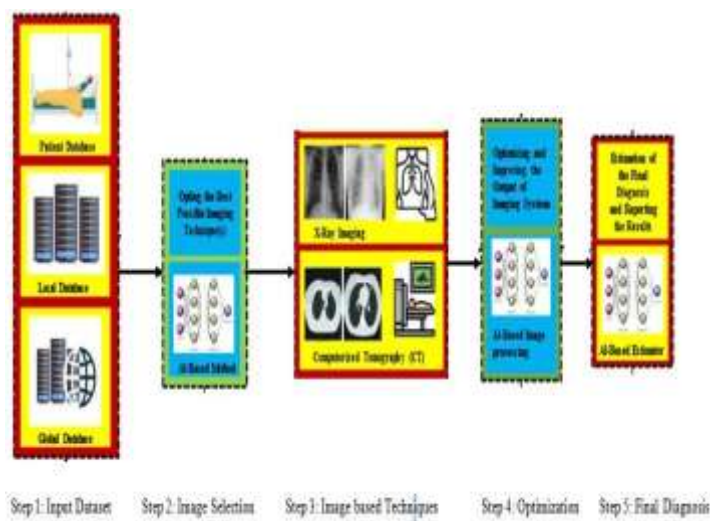


Fig 1: System Architecture

Five levels of the architecture display diverse ANN applications for diagnosing and tracking illnesses. The method has the potential to be applied to various medical imaging analyses even though it has been specifically created to address COVID-19-related issues.

The database is tied to and intended for access through the input layer, which is the first layer. This layer is connected to the primary (front-end) computer through a fast channel (s). The database machine is strongly tied to the primary CPU, whereas the database server is loosely coupled through the network. Using database software and a lot of microprocessors, database machines can send massive amounts of data to the mainframe.

3.1 IMPLEMENTAION

This project has the following modules

- ❖ Admin Module
- ❖ User Module

3.1.1 ADMIN MODULE:

To find out the COVID-19 probability in human body based on medical scanning (X-ray/CT Scan images) uses the machine learning techniques.

In this prediction used GAN (Generative Adversarial Network) model, it's find outs the COVID-19 probability in CT scan images automatically.

Proposed neural network model and the Generative Adversarial Network (GAN). To analyze electron microscopy images, feature extraction technique can be adopted. GANs are a special type of neural network model in which two networks are trained at the same time while one is focused on generating images, and the other performs discriminating. GANs can solve these problems through effective modeling of the latent distribution of the training data. GANs have successfully been applied to image-to-image translation, segmentation and many other subfields of medical image computing. Because of its usefulness in counteracting domain shift, and effectiveness in generating new image samples, the adversarial training scheme has recently attracted a lot of attention. This model has achieved state-of-the-art performance in a lot of tasks, namely text- to-image synthesis super-resolution, and image-to-image translation

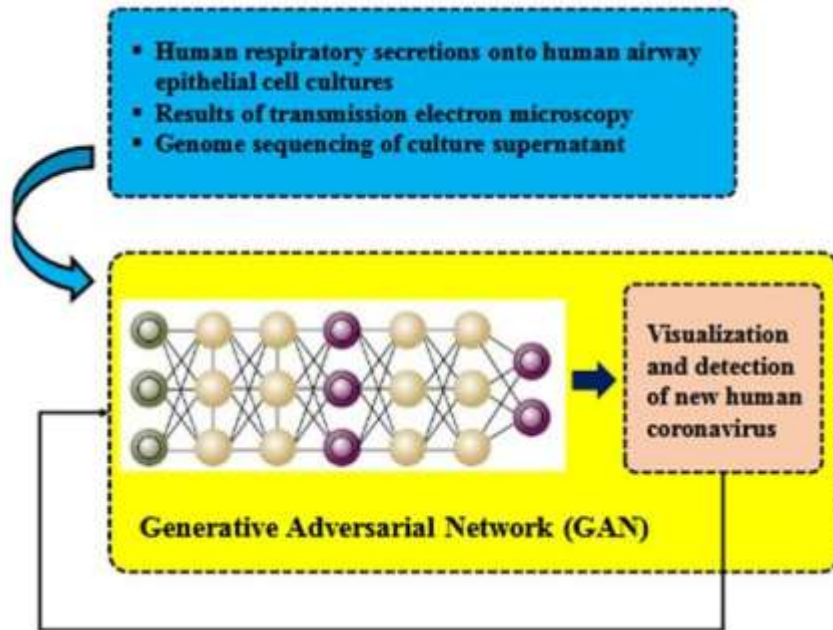


Fig 2: GAN network

3.1.2 USER MODULE :

User module can upload the MRI scan based on that scanning report our algorithm analyse the image picture value based on the picture value will analyse whether covid is detected or not.

4.RESULTS AND DISCUSSION



Fig 3: Button To Upload MRI Image



Fig 4: Button To Predict Image

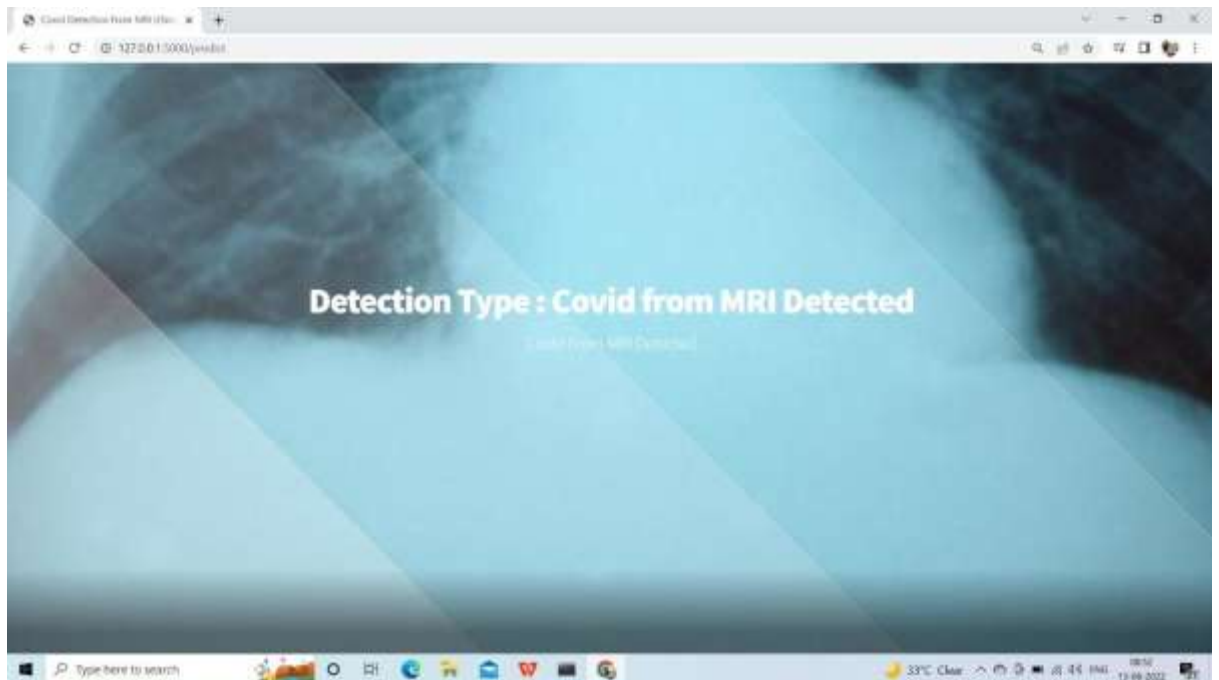


Fig 5: Result Of Prediction



Fig 6: Result Of Prediction

5.CONCLUSION

In the realm of AI-based approaches, the conceptual frameworks and platforms that are appropriate for dealing with COVID-19 difficulties. Incorporating diagnostic methods from COVID-19, many algorithms have been created, including RNN, LSTM, GAN, and ELM. Studying COVID-19's geography, high-risk individuals and radiography were the key themes addressed in this study. Using a variety of clinical and non-clinical datasets, we demonstrated a mechanism for selecting the most suited estimation and prediction models for specified parameters.

When it comes to dealing with the virus, these platforms help AI professionals evaluate massive datasets and help doctors train robots, design algorithms, or refine the information processed for more efficiency and accuracy. With their potential to create a work environment where AI specialists and physicians may collaborate, they are appealing.

REFERENCES

- [1] C. Huang et al., "Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China," *The lancet*, vol. 395, no. 10223, pp.497-506, 2020.

- [2] N. Chen et al., “Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study,” *The Lancet*, vol. 395, no. 10223, pp. 507-513, 2020.
- [3] D. Wang et al., “Clinical characteristics of 138 hospitalized patients with 2019 novel coronavirus–infected pneumonia in Wuhan, China,” *Jama*, vol. 323, no. 11, pp. 1061-1069, 2020.
- [4] K. Liu et al., “Clinical characteristics of novel coronavirus cases in tertiary hospitals in Hubei Province,” *Chinese medical journal*, 2020.
- [5] T. Guo et al., “Cardiovascular implications of fatal outcomes of patients with coronavirus disease 2019 (COVID-19),” *JAMA cardiology*, 2020.
- [6] P. Hamet and J. Tremblay, “Artificial intelligence in medicine,” *Metabolism*, vol. 69, pp. S36-S40, 2017.