Comparative Review: Guess Covid 19 With The Assistance OF One of The Smart Systems As AI

Syeda Lamima Farhat[a], Zahid Hossain[b], Dhiman Sarker[c] and Jabir Al Nahian[d]

Syeda15-10452@diu.edu.bd, Zahid15-10397@diu.edu.bd, Dhiman15-10397@diu.edu.bd, Jabir15-10414@diu.edu.bd
[a]Daffodil International University, Dhaka -1212, Bhangaladesh
[b]Daffodil International University, Dhaka -1212, Bhangaladesh
[c]Daffodil International University, Dhaka -1212, Bhangaladesh
[d]Daffodil International University, Dhaka -1212, Bhangaladesh

Abstract

This paper represents a comparative study and gives an overview of some of the research works on the very important topic right now COVID-19 and AI. In recent, the flow of infected rate of COVID-19 is increasing day by day. For predicting the flow of infected, recovery or death is very important. LSTM as Long Short-Term Memory is utilized for predicting. The LSTM networks are a sort of repetitive neural network competent for learning arrange reliance in arrangement expectation issues. Different types of methodology as hybrid AI modal, SEIR model, time series, and CT image used for prediction Coronavirus. We are going to survey a few papers around COVID-19 and AI-based work and examine their model, methodology, and algorithms. All those papers attempt to anticipate long-term circumstances around COVID-19. Utilizing these distinctive sorts of models, prepare them and calculate an estimated value that can create esteem which will be the same as long haul real-time result. Possibly a few shows create likely precise results a few demonstrate fizzled to create, but everybody tries to create their show impeccably which can produce nearly precise values.

Keywords: Covid-19; Covid-19 disease; Covid-19 prediction; hybrid AI model; CT (Computer Tomography); Deep Learning, Susceptible-Exposed-Infectious-Removed (SEIR); Time Series Forecasting.

1. Introduction

Covid-19 has become the name of the panic. The number of victims is increasing day by day. It has as of now influenced over 218 nations and around the world with 141M cases as of now established and 80.4M individuals recuperated but more than 3.01M kicked the bucket as of 22 April 2021. The primary details of Coronavirus Illness 2019 (COVID- 19) at Wuhan, China in December 2019 within the capital of the Hubei Area. Inside to start with orchestrating of transmission, Covid-19 was not smothered because of highly changeable behavior at the first stage of the epidemic Covid-19 was not essentially repressed since of exceedingly changeable behavior at the primary stage of the epidemic as the same time restricted information approximately infection is another enormous need for the medical community. [1]. Computing strategies have recently become more valuable in giving capturing information that can translate to progressed wellbeing approaches and methodologies. As of late AI-based calculations are developing quickly. The most extreme nation utilized AI for anticipating Coronavirus (COVID-19). Health conventions got to be streamlined to

facilitate connectivity between gadgets without jeopardizing data protection or anticipating information reconnaissance. The technological transition will lead to increased utilization of computing systems and better management hones, as within the case of a pandemic, which is able moreover to contribute to its prominent position in urban wellbeing arrangement [14]. Social mechanical autonomy is set to convert healthcare into different spaces, counting modern frameworks of expanded and helped to live. The presentation of healthcare laborers to COVID-19 and their ought to self-isolate has been a major concern, particularly given the significant demands on serious care. Urban mechanical rebuilding has the potential to convert the frameworks of everyday social life through advances of human expansion and substitution [15]. Development insinuates methods, frame of reference, and contraptions which are the effect of coherent documentation being utilized for commonsense purposes. Artificial Intelligence plays an imperative part in reform this strategy. Machine Learning, Natural Language Processing, and Computer Vision applications are characterized by Artificial Intelligent. These abilities taught computers to create massive data-based mechanisms for drafting, portraying, and forecasting. Manufactured insights can be used to monitor the spread of the COVID-19 virus over space and time. To fight the coronavirus, AI focuses primarily on medical diagnosis and inflammation, radiology management, disease tracking, and forecasting. [11]. But sadly, the spread of this disease is much higher and more deadly than all other diseases. It is spreading from ordinary people to people through some symptoms. According to the health observation of the general people, the main symptoms of the patients are cough, dyspnea, fatigue, and fever. [2]. But sadly, no medicine or method can control this disease. In this context, all other cities in the world, including China, have had to choose the path of lockdown. Although the number of people affected by the lockdown has dropped slightly, no one has yet been able to come up with an effective way to combat the disease. However, various companies and researchers are trying their best to make the disease resistant. In this perplexing fight science and innovation are playing a crucial part. For example, as we know that China is the root of the virus. So, China started to follow different types of a path is identified the virus. They also used manufactured insights (AI) by depending upon face acknowledgment cameras to locate the covid-19 positive patients from different types of travel history. At the same time, they used robots to deliver food and medicine to positive patients. Governing infected areas and non-infected areas by drone. [3]. AI has been utilized broadly to find modern atoms on the way to discover help for Infection. With the help of various AI models, it is becoming possible to get an idea of what the Covid-19 might look like next. It is possible to find out how similar the current virus is and how much it is similar to some of the previous forms. An AI coughing test would deliver a couple of points of interest that will to some degree balance the issues with existing natural testing approaches. Capabilities of tests consolidate non-invasive real-time comes approximately, fundamentally, zero variable brought, open by anybody, and able to longitudinally screen patients [13]. The LSTM show has been utilized at different times to decide anticipated the precision of any demonstration and calculate the effectiveness of the creation show. Sometimes a huge number of data will store in the system and have to find the accuracy of the system in that AI method will help to solve this type of problem easily, for managing this issue, a well characterizes expectation organize as long short-term memory (LSTM) and arranging module as ordinary tongue planning (NLP) proposed into the excoriate show up to calculate, upgrade the contamination rate, and move forward the accuracy of assessment of the torment model. Lon Short-Term Memory may be a classic RNN proposed by Hoch Reiter and Schmid Huber [4]. Comparatively some other methods are also used to predict Covid-19 those processes are not used in any AI models.

2. RESEARCH TECHNIQUE

Here we discuss our reviews papers that used the methodology, model, sub-method or sub-model, workflow. And using all of those parts how their model work will be discussing there. A. HYBRID AI

MODEL: According's to the epidemic models, we know that everyday numbers of people are affected by a coronavirus. And the daily confirm patients in the future attend if those with coronavirus those how are not quarantined. But numbers of models regard only the patients who are contaminated but not isolated as the establishment. At that state duplicate, the assessed contamination rate to expect the figure of modern each day affirmed cases. [5]. Normal types of all models generally treat all individuals with coronavirus as the same infection rate and simple it will be incapable to calculate the accurate value. On this suspicion, they raised an ISI epidemic show made of a review approach and an assembled multipara meter strategy. The approach's basic principle is to compare the cumulative range of advanced claimed instances over even a broad period to the number of unused affirmed cases at time t. On the group multipara meter, determined the impact of proved cases at various time ranges before the time t. Confirmed cases on time t, used in the model to determine the impacted rate of influenced cases in various time zone. Then, the upgraded model used will be used for analyzing the laws of affect diseases. [6]. At the same time, the LSTM network is also conjectured the infection rate from the proposed model. And after that both combined and estimate the number of tainted cases. Based on the data media scope, open mindfulness information into NLP models. The model generates many featured news to different cities. The highlights are used the network LSTM to a precise lapsus of the influenced rate by the given model. It will predict the infected case depends on the transmission laws and development trends. [6]. Inside the ISI appear, they acknowledge that the genuine defilement rate is β (t), and the defilement rate that backslides underneath the exponential work is β (ˆ t). We utilize the neural organization to foresee the inclination between the genuine defilement rate and the backslid defilement rate. We let the title of day t be y (t) = β (t) – β1 (t), which is taken as the slant highlight for desire. In this way, they can utilize the LSTM organize as a praise to the ISI appearance [6]. B. SEIR model: Here author modified the original SEIR equation and create an updated equation that will show its infected population and non-infected population. According's to the new model, they assess two parameters β and γ where β is the product of the individuals uncovered every day by the contaminated individuals (k). And the probability of disease (b) (as β= kb). The average rate of death or rescue people (as γ = 1/D, where D is the average duration of the infection) [7]. In that case, a mid-value is generated as reported in 4-10 days then the midpoint is 5 days. SEIR is an epidemiological appearance utilized to anticipate irresistible contamination components by sectionalizing the populace into four conceivable states: Defenseless [S], Uncovered or inert [E], Powerful [I], or Cleared [R]. The degree of a people in each state is spoken to by the rate of change between each, β ([S] to [E]), σ ([E] to [I]) and γ ([I] to [R]). We solidified the migration list [Sin/out (t)] for the past day, (t) to account for a pool of [S (t+1)] at the range of charmed into the changed SEIR appear. Utilizing convenient development record for each domain up to the time of the examination but rearranged the development file for a short time later dates concurring to the circumstance we are reenacting [7]. They used 2003 SARS statistics as training the data set and the cases between April and June 2003. Utilized the predominant LSTM illustrate, a sort of tedious neural organization (RNN) that's utilized to handle and predict the assorted time course of action issues. The series problem is used to foresee numbers of unused contaminations over time [7]. C. TIME SERIES: First of all, they collect 70 days of a dataset of the Covid-19. Then they used their dataset in the LSTM model to train and predict the accuracy of the dataset. So before preprocessing the dataset is divided into two different parts. One portion of the information is utilized to prepare the demonstration (70 %of data) and the moment portion of the information is utilized for testing the demonstration (30% of data). RMSE value using a Deep Neural Networks of Min-Max Shackler (highlight run = (-1, 1)). RNN as well as two backdoor layers with input and resign layers build by the thick layer. [8]. Time arrangement analysis assessment any model taking after a few hypothetical Metric functions like MSE, but it is familiar to RMSE (root mean squared error) function. RMSE function also used metrics for recreating the relapse learning. For predicting future COVID-19 analysis of time series, RMSE metric function is also used in LSTM models. [8]. Generally, they use three types of data to train their model death, recovery, and confirmed cases. And start a comparative study between the RF regression model, SVR model, and LSTM model. Create the RMSE regard for SVR, RF, and LSTM relapse on the arrange, test and values of RMSE become large in comparison but because it was LSTM evaluation

RMSE regard is exact [8]. The short-term sequence can generate more strong visualization than Long-term sequences. A culminate show with tall execution on a particular time zone needs a convolutional arrange based on a covered up layer with input, thick, and yield layers [9]. D. CT IMAGE: This system work with CT and flags cases of COVID-19 features. Compared with chest computer tomography (CT), chest x-ray imaging is more reasonable for being joining into a large-scale AI-based screening arrange for COVID-19 [12]. Basically, the condition of the lung is the main key point of this methodology. Patient's lung conditions copy compared with affected patient's lung condition. If any patient's lung condition is matched to a comparable lung condition, then the patient detects as covid-19 positive patients. And all the processes are done by an automated system. The total system formed on various components but the exploration of the CT case at two main levels: Subsystem (I): For knobs and central opacities already created calculations were utilized for the 3D investigation of case volume. Subsystem (II): a 2D examination of each parcel of the case to recognize and localize larger-sized diffuse opacities counting ground-glass invades as the clinical presentative of the COVID-19 [10]. Network activation maps computed corona score using volumetric summation. For including pixel volume, the score is tough to cut thickness and pixeled dividing. They attempt correlative the Crown score and normalized it with the score computed at the primary time point for indicating persistent checking malady advance. They begin with an assessment of the capacity to identify slice-level Coronavirus. The execution of this step is pivotal for getting generally case wise location. For the approval step, we utilized 10% of the cuts from the improvement dataset. The part was quite astute and there's no cover with the cuts utilized for preparing. An add-up of 270 cuts was analyzed: 150 ordinary cuts and 120 COVID-19 suspected cuts. Zone beneath Bend (AUC) was 0.994 with 94% affectability and 98% specificity (at edge 0.5) [10].

3. COMPARATIVE STUDY BETWEEN MODELS

In this paper, we survey four papers' content summarization strategies. And the paper is based on COVID-19 and using AI as an automated system to predict the effect of this virus. Here we discuss the model and algorithms are used to predict this virus. Some papers are discussing briefly their algorithm, some are focused on future perspective, and some are work with a body part (as lung). They utilized their dataset in the model for foreseeing the COVID-19 proposed implanted with the NLP modules, the forecast result of the show is profoundly reliable with genuine cases which demonstrates that the crossbreed show can more precisely be analyzed [6]. In that article, proposing model is a forecast model and can get whole country information due to the pandemic of COVID-19. They use time series analysis taking data from IEDCR healthcare in BD. LSTM model estimating future three cases confirmed, recover, death. Forecasting up to 30 days' scenario. According's to the scenario the confirmed and death rate will increase, and the recovery rate will decrease very poorly [8]. They used a dynamic model SEIR. This model was used in China's mainland for the COVID-19 situation. At the same time, an AI-based modular prepared on past SARS dataset and the appearance guarantee for the future expectation of the epidemic. The modal used a 7-days brooding period which is based on early gauges, afterward the middle brooding period to indication onset is three days which is a closer report of SARS but can range from 0 to 24 days. It's had a praising fit in the middle of genuine and LSTM-predicted curve [7]. According to the paper rapidly developed AI automated tools analyzed CT images and achieved high accuracy in the detection of Corona virus-positive patients. Using the deep learning image analysis, they can have classified results for COVID-19 and no COVID-19 cases per thoracic CT ponders of 0.996 AUC on datasets of Chinses and contaminated patients [10]. A Cascaded Learning Strategy for Robust COVID-19 Pneumonia about coarse to fine conduct, our cascaded technique comprises lung division, pneumonia affirmation, and COVID-19 affirmation as dynamic screening. Concerning course to fine conduct, our cascaded technique comprises lung division, pneumonia affirmation, and COVID-19 affirmation as dynamic screening. Chest X-Ray Screening [12]. All of these models are commonly utilized to undertake to distinguish Covid-19 in various ways and to urge an inexact shape of its effect within the future. And within

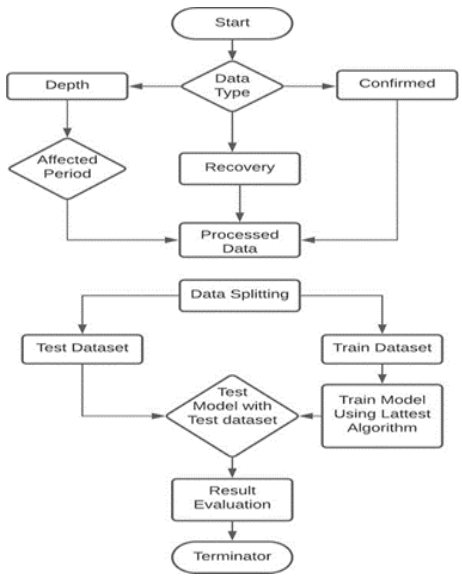
the light of all these models, we have moreover created a show that will essentially collect data from distinctive mediums and make that data usable within the right way and within the light of that data will be able to provide an inexact frame of what will happen to Covid-19 within the future.

Table 1: Covid 19 detection comparability table

Reference Paper	Model	Applied Techniques	Input text portrayal	Result/Accuracy
Predicting COVID-19 using Hybrid AI [6]	ISI	LSTM NLP	Dataset Related News and Report Curve Infection Rate MAE Curve	Infected Disease Data same to real-life data
Modified SEIR and AI prediction COVID-19 [7	Modified SEIR	LSTM RNN	SARS Dataset Graph of new cases LSTM base SEIR base	The future predicting outcome of the dataset is the same to the real-time data.
Forecasting upcoming Covid19 cases use Time series [8]	Time series	LSTM RMSE RNN SVR RFR	IEDCR Dataset Curve Confirmed, Recovery and Death Cases	Forecast a 30 days' scenario of the Covid-19 confirmed, Recovery and Death cases
Automate Covid-19 location and Persistent monitoring using DL CT image analysis [10]	CT image	2D lung volume 3D lung volume	Lung Dataset and CT image Focal opacities ROC curves	Detecting rate of COVID-19 positive patients is better than all other systems.
COVID-19 Prediction using ARIMA Model	ARIMA Model	R-Squared Score MAE MSE RMSE	Web scraped Covid-19 Dataset and Fb Prophet ARIMA Model	Predicts the overall number of active cases for the next 15 days across India
An Intelligent System for Prediction of COVID-19 Case using Machine Learning Framework-Logistic Regression	Logistic Regression Model	Python machine learning framework	COVID-19 based on Logistic regression	Gave 92% accuracy based on the dataset, the system is trained

4. Proposed Model

We have to predict the COVID-19 infected ratio. That's why we need an accurate dataset of COVID-19. To begin with, we need to collect data from health care or sources. But in root time all types of data are store within the sources haphazardly, so we need to make our information in organized information shape for our claim needs. In the figure 1, we propose our propose model with its procedure.



Therefore, we studied the data type. So, we need to check our dataset and confirmed all the data that are confirmed, death, or recovery cases. Based on these three models we processed our data. If the data indicate death, we tried to find out the affected period. By detecting the probable period, we may predict how many people may be infected in that time. After all the processes are done it generated a structured dataset. After the processing step, we parted the data into two sets: a training set for the training model, and a testing model test set is used. This model gets trained by giving in the training data set. Learning models used here are ISI, Modified SEIR, Time series, DL CT image, ARIMA Model, Logistic Regression Model. Then the techniques have been trained arbitrarily. This model has been evaluated based on important metrics such as R-Squared Score, MAE, MSE, and RMSE.

5. Conclusions

The COVID-19 is a potential threat across the world since the number of sufferers and deaths quickly rises. It has become a major issue to protect the virus. In this paper, we have reviewed four papers and those are on COVID-19 and AI-based. And these four paperwork with different types of models, same or different types of algorithms and mechanisms. But all the papers are trying their best to find their promising outcome. Every paper wants to find the COVID-19 affected scenario and try to predict the rate to reduce the number of effects. But the work is not done. Because we don't succeed to prevent the virus. So many researchers are trying to create the best model, a method to prevent this pandemic issue. Within the proposed models, our fundamental

focus is to anticipate the circumstance of the COVID-19 patient's proportion of confirmed, death or recuperation cases. Compare the values with the genuine-time information and determining the result.

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Syeda Lamima Farhata, She has recently completed BSC in CSE from Daffodil International University. She is currently working on research field and getting prepared to study MS abroad. She has a keen interest on Artificial Intelligence related field. She has a good capability of adapting knowledge easily.



Zahid Hossain, was born Dhaka, Bangladesh on December 7, 1999. Now he is studying

Computer Science and Engineering at Daffodil International University, Dhaka, Bangladesh. He is currently working on research related. Gaining knowledge about data mining, machine learning also interested in working broadly in the deep learning process.
Besides, now, he is serving as a Software Developer in Al-Manar group, Dhaka, Bangladesh.



Dhiman Sarkar, was born Jhenaidah, Khulna, Dhaka, Bangladesh on January 4, 1998. Now he is studying Computer Science and Engineering at Daffodil International University, Dhaka, Bangladesh. He is currently working on research related. Gaining knowledge about data mining, machine learning also interested in working broadly in the deep learning process.



Jabir Al Nahian, he is studying Computer Science and Engineering at Daffodil International University, Dhaka, Bangladesh. He is a researcher on Computational Intelligence Lab (CiLab.ai). He is very interested in Artificial Intelligence related field like – Data Science, Natural Language Processing, Image processing etc.