

Developing the Covid Prediction Model Using LSTM Technique

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Abstract

The primary aim of this study is to predict the no of COVID-19 cases using the technology called Deep learning LSTM model technique in the Indian Population and is to estimate the future death cases from COVID-19. Precise forecast of the amount of COVID-19 tainted cases day after day is quickly turning into a basic need all round the world to alleviate the burden on the various wellbeing frameworks. In an exceedingly thickly populated nation like India which has presently the second most noteworthy number of contaminations and restricted clinical help, it's a requirement for the specialists to comprehend the insights prior time to resolve these issues all the more successfully. During this article, an information-driven exchange learning-based model is suggested that considers the states of varied nations which have seen the COVID-19 contamination. . we've got pre-prepared LSTM models for predict the no of cases in INDIA .In this we have used the real dataset from kaggle website which is updated on daily basis. This datasets helps us to detect the no of positive cases of COVID-19 and helps the clinical staff for further requirements and essentials.

Keywords: LSTM ; COVID-19; Deep Learning ; Kaggle ; Datasets ; Prediction Model;

1. Introduction

Medical services refer to the organized delivery of care to individuals and communities. Medical care is an attempt by a qualified and licensed physician to protect or achieve physical , emotional or mental well-being. Health professionals are believed to make a significant contribution to promoting individuals/public health. The healthcare industry is responsible for the manufacture and distribution of medicines and services necessary to protect, treat, and maintain well-being. Health care for patients affected by the Coronavirus disease 2019 (COVID-19) is a challenge, especially in India.

Many governments have been collecting data and trying to examine the data to better equip them in providing healthcare services to patients with COVID-19. The COVID-19 pandemic has provoked healthcare facilities, with a large number of cases resulting in acute capacity constraints limiting the delivery of healthcare services. In line with health goals, there are several factors and aspects of the medical sector that need to be actively planned and designed. This data will be critical in decision making for the presidency, the health sector and other stakeholders. The results of this study have implications for health management standards. The health care system is expected to perform well in all of these aspects to meet customer needs, whether the customer is a patient, doctor, employer, or functional department within the organization.

1.1. What is Covid-19?

The new virus called covid19 firstly spread in china at the end of the Dec 2019 and a large no of people became infected . This virus is seen on the labortary of Wuhan (China) , Right now this virus is spread all over the World and infected a lot no of peoples . Over the last few months , the diseases , no of cases positive cases and no of deaths increases rapidly. The different different waves of covid19 has been seen over the world. India has the 2nd largest population so the no of covid cases increases rapidly over here and stands in the top 5 highly infected countries.

Coronavirus is an enormous class of infections that cause sickness and lack of breathing . The covid 19 infected by contacting persons . For the safety measure the pandemic is started and many of us don't know when its over. The spread of virus highly impacted the life style of human and help environment to heal. Childrens are locked at home. All educational institutions were closed , employment were guided to do work from home(WFH). The elder people and the diseases like bp , cancer are on high risk . The symptoms of virus is fever , cough , cold , headache , diarrhea , pain in muscle , lack of smell and lack of breathing. This Corona in human community by touching , sneezing and talking . Since this infection is spread through individuals to individuals contact so increments in sure no of cases

have been recorded. An ordinary human can be by interacting with Coronavirus case person or thing contact by Coronavirus case individual. It is significant stay away with contaminated individual or isolate the tainted individual.

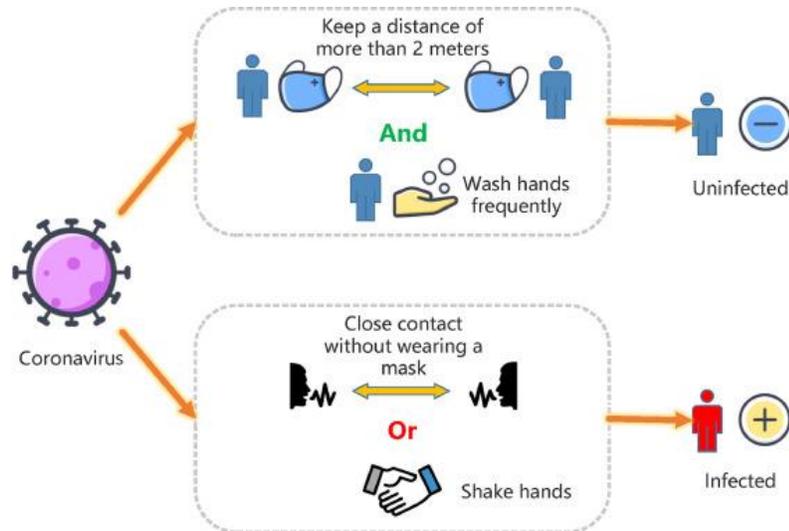


Fig 1: COVID uninfected vs infected person

To deal with the present circumstance, we should need to take careful step to keep yourself from tainted and second thing we need to isolate the contaminated individual and medication help. Taking all shields cautiously at individuals is must for that utilization of sanitizer, covers and keep up with social-separating stay away from get-together.

If we talk about India, the absolute 1st COVID-19 case was accounted in the Kerala on 30th jan 2020 of an understudy got back from Wuhan University. On the month of march 2020 the cases are in figure of 500. As the time passes the positive no of cases increases. The highly affected state is Maharashtra and lowest is Mizoram [10]. India is a dense population and culture country. It is so challenging to handle this condition. Government has also taken a lot no of steps to handle this situation, arrange medical kits for infected persons, a proper treatment. Some of the people don't follow the guidelines accomplished by the government; cause the positive no of infected people.

The time while paper was writing (July 20, 2021), 90,698,044 cases of the COVID-19 virus had been reported worldwide.[6]

2. Research question

I. What method is used for Predicting the COVID-19 Cases.

Answer :- To conduct a conductive and experimental study to see whether the LSTM model is appropriate to find out the COVID-19 cases with the help of India datasets and find out the accuracy of model by using LSTM Datasets.

II. What are features will Predict the COVID cases

Answer :- To conduct a experimental study which identify the feature that will predict the no of cases in human being.

3. Method

It is necessary to make a solution for predicting the no of covid cases and then arranged all the medical

equipment for treatment. We used LSTM techniques to predict the number of cases using the past number of cases. LSTM is used to recognize the pattern with the analysis of the data. In this paper, we used LSTM as a prediction model.

3.1. LSTM

Long short-term memory is utilized in this paper. LSTM is a recurrent neural network model which is utilized in deep learning. Long-term memory utilizes a Recurrent neural network which is used to perceive designs in a grouping of information.

LSTM, a "cutting edge" model to foresee measurement information. LSTM has input associations. A typical LSTM unit consists of a cell, data input, output input, and ignored input. Phone reviews apply to everyone through arrogant time intervals and three inputs direct the movement of information to and from the phone. In a LSTM unit, it endeavors to "review" all the past data that the association is seen up to this point and to "disregard" unessential data.

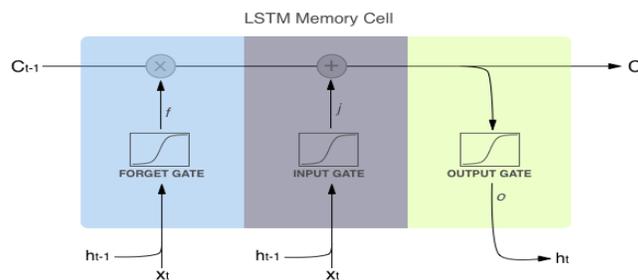


Fig 2: LSTM model

3.2. LSTM Equations

The figure below shows the info and yields of a LSTM model for a solitary time frame step. The LSTM has an info $x(t)$ which might be the yield of a CNN or the information succession straightforwardly $h(t-1)$ and $c(t-1)$ are the contributions from the past time step LSTM. output gate is the yield of the LSTM model.

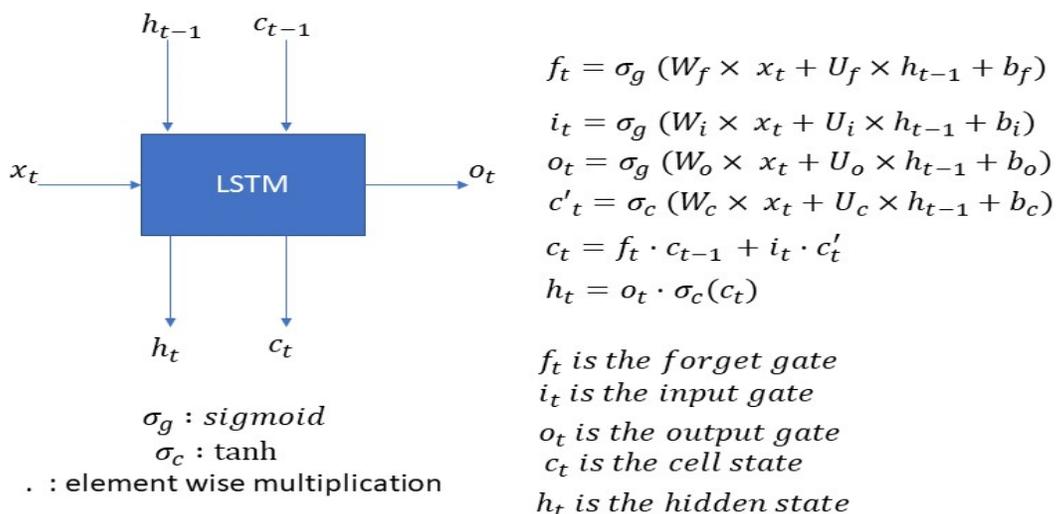


Fig 3: LSTM Equations

3.3. Datasets

In this paper, we utilized datasets from www.kaggle.com for examination and forecast of Coronavirus cases in India. The kaggle site datasets are Public in nature. The dataset incorporates 20 capabilities as signs and manifestations and one mark with 11435 data. The assorted elements of COVID-19 likewise comprise breath

Syndromes, which give neurotic indications which are the provisions in anticipating the Covid. those components lead Kaggle to the huge applied data set for analysts around the world.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	iso_code	location	date	total_case	new_case	total_dear	new_deat	total_case	new_case	total_dear	new_deat	total_test	new_test	total_test	new_test	tests_unit	stringency	populatio	popul		
2	ABW	Aruba	#####	2	2	0	0	18.733	18.733	0	0							0	106766	5€	
3	ABW	Aruba	#####	4	2	0	0	37.465	18.733	0	0							30.56	106766	5€	
4	ABW	Aruba	#####	12	8	0	0	112.395	74.93	0	0							44.84	106766	5€	
5	ABW	Aruba	#####	17	5	0	0	159.227	46.831	0	0							44.84	106766	5€	
6	ABW	Aruba	#####	19	2	0	0	177.959	18.733	0	0							44.84	106766	5€	
7	ABW	Aruba	#####	28	9	0	0	262.256	84.296	0	0							44.84	106766	5€	
8	ABW	Aruba	#####	28	0	0	0	262.256	0	0	0							44.84	106766	5€	
9	ABW	Aruba	#####	28	0	0	0	262.256	0	0	0							83.46	106766	5€	
10	ABW	Aruba	#####	50	22	0	0	468.314	206.058	0	0							83.46	106766	5€	
11	ABW	Aruba	#####	55	5	0	0	515.145	46.831	0	0							83.46	106766	5€	
12	ABW	Aruba	#####	55	0	0	0	515.145	0	0	0							83.46	106766	5€	
13	ABW	Aruba	#####	60	5	0	0	561.977	46.831	0	0							83.46	106766	5€	
14	ABW	Aruba	#####	62	2	0	0	580.709	18.733	0	0							83.46	106766	5€	
15	ABW	Aruba	#####	64	2	0	0	599.442	18.733	0	0							83.46	106766	5€	
16	ABW	Aruba	#####	64	0	0	0	599.442	0	0	0							83.46	106766	5€	
17	ABW	Aruba	#####	71	7	0	0	665.006	65.564	0	0							83.46	106766	5€	
18	ABW	Aruba	#####	74	3	0	0	693.105	28.099	0	0							83.46	106766	5€	
19	ABW	Aruba	#####	77	3	0	0	721.203	28.099	0	0							83.46	106766	5€	
20	ABW	Aruba	#####	82	5	0	0	768.035	46.831	0	0							86.11	106766	5€	
21	ABW	Aruba	#####	86	4	0	0	805.5	37.465	0	0							83.46	106766	5€	
22	ABW	Aruba	#####	92	6	0	0	861.698	56.198	0	0							86.11	106766	5€	
23	ABW	Aruba	#####	92	0	0	0	861.698	0	0	0							86.11	106766	5€	
24	ABW	Aruba	#####	92	0	0	0	861.698	0	0	0							83.46	106766	5€	
25	ABW	Aruba	#####	92	0	0	0	861.698	0	0	0							83.46	106766	5€	

Fig 4: Covid Prediction Dataset from Kaggle site

Consequently, in this work, www.kaggle.com informational index is favored contrasted with other freely accessible informational collections. It gives a few components of the infection in different stages, the spread of sickness, and the death rate. These are used in the current work to find out about contaminations and sickness movement.

4. Literature Review

Who declared the COVID-19 a pandemic disease. Therefore the only way to prevent this disease is to avoid contact with infected people. In the on-going pandemic, a lot of research has started to examine the future of COVID-19. Some researchers predict the damage this disease can cause. This paper predicts the future trends of COVID-19 through deep learning.

- Saloni Shah uses existing statistical modelling tools. On the one hand, this document shows how precisely research makes the fight against this disease possible; On the other hand, it also shows how the lack of response from local authorities can stop the spread of this virus. This could be our attempt to collect various research methods and compare their accuracy in predicting the spread of COVID-19.

- Zeynep Ceylan utilized (ARIMA) an autoregressive integrated moving average model to evaluate the future of the coronavirus in the three most affected countries in Europe, such as Italy, Spain and France. The author uses the ARIMA model for this forecast. This paper states that the ARIMA model is suitable for predicting the future impact of COVID-19.[2]
- Parul Arora used Long term shortest memory for prediction covid cases in India. Recurrent based lstm model such as a Deep learning , Bi-directional and Convolution LSTM are applied to Indian datasets for predicting the cases within one week along with all the states and union tertiary. According to him , The study done in this paper can be applied by other countries for estimate the corona cases in national and state level.[3]
- Moutaz Alazab utilized the Convolution deep learning models. The real time datasets are used in this paper . The Author examine the Chest X-ray imagine to identify such patients. The analysis is valuable in COVID-19 diagnosis. The 3 forecasting models are used the prophet algorithm , ARIMA and LSTM model – were adopted the no of confirmation cases , the death cases and the recoveries over next 7 days.[4]
- Yazeed Zoabi effective use of SARS-CoV-2 and diagnose COVID-19 and can reduce the burden on medical personnel. This framework can be used, among other things, when resources for testing for COVID-19 are limited.[7]
- Saud Sheikh used regression model of deep learning . They implement two regression models and evaluating the value and error values. This paper predict the no of confirmed cases , death cases , active and cured cases.[8]
- Osama Shahid this paper uses machine learning technique for Detection , Prevention and medical assistance. Gives no of ways how Machine Learning could be used for detection , prevention and medical assistance.[9]

5. Conclusion

The proposed transfer learning-based model has set up its incomparability in anticipating the COVID-19 contamination over the looked at models. We would investigate diverse ensemble strategies later on and might propose a considerably more grounded expectation model than the customary LSTM-RNNs which are as of now the most well-known models utilized in the writing. The current model can just allow a one-day-ahead forecast of the cases. Later on, this work would be stretched out to give somewhere around seven days ahead forecast. That would be considerably more supportive in the factual investigation of the current cases. In addition, as of now said, the current system is totally information-driven and has not joined any area of information.

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