

Covid-19 prediction using Machine Learning (ML)

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ABSTRACT- Covid-19 is one of the greatest pandemic we have seen in today's world, many people have lost their lives due to outage of bed in hospitals, if somehow we knew that how much cases of covid-19 will occur in coming days we can be prepared for outcomes. In machine learning by using previous data it is possible to predict the number of cases that will be seen in future. In this paper we will predict the number of cases using machine learning so that government prepare that number of bed for patient in hospitals across India.

Keywords – Machine Learning, Artificial intelligence, SVM, Pandas, NumPy

I. INTRODUCTION

In year 2019 covid-19 came into existence to the world, It has spread through China to all over the world, the corona virus have caused millions of death across the globe and all over the India. In starting of year 2020 covid-19 became uncontrolled and the government had to shut down every single nation across the globe. The covid-19 mainly spread from city in China called Wuhan. It is believed that Chinese scientists was testing some virus in their labs and the virus become uncontrollable and spread in all over Wuhan and from Wuhan it spread to all over the China and to all over the world.

Covid-19 affected the world in many aspects, and here is the description of different fields that are affected by covid-19 -

Effect of covid-19 on economy was that the GDP of World has crashed by 23.4% and the GDP of India has crashed by 7.3% in financial year 2020-21 due to which government ran out of funds in several areas of countries and that affected the lives of normal working class people.(Mangla 2021)] And Effect of covid-19 on tourism was that the tourism sector contributes about 2.4% and 9.2% respectively to our GDP. The tourism industry has helped about 4.3 CRs people in financial year

2018-19 but Aviation and Tourism industries were the first and most affected by covid-19. The people who were fully dependent on tourism had lost their source of income. [(Mangla 2021)]Effect of covid-19 on education was that the times of India report says that the covid-19 has affected 32 CRs student education. The government sees this as natural crisis which will lead to unemployment in future as well.

In case of students from all over the world- within the first week of covid-19 107 countries had fully closed their schools and universities and worldwide 86.5 CRs student's lives had been affected.[(Mangla 2021)]Effect of covid-19 on Hospital industry was due to covid-19 the doctors and nurse had to work overtime without thinking for a second because the number of cases were so vast, and also in India the hospital ran out of bed for patients in almost many state, the hospitals had no idea that how many cases will be seen in coming days, and due to lack of bed for patients many people had lost their lives in covid-19 pandemic.Effect of covid-19 on business owners was that the covid-19 had affected shopkeepers as well as the customer, the market was shut down due to lockdown and almost every shopkeeper were affected by lockdown, and also the people who had their personal business were not able to do their work due to lockdown.Effect of covid-19 on world - Due to covid-19 millions of people fell into poverty and they were helpless cause government was out of funds and also government was not able to understand how to handle these large number of covid-19 cases at that instant.

Challenges faced by government was that government was not able to provide beds in hospitals for all patients, and also government didn't knew about how many cases will be seen in coming months. There was large number of cases and less number of hospitals availability. And due to covid-19 economic crises was also seen in India.

And government was also not able to manage transportation system there were lot of labours and workers who were not able to return home. And also the food problem was seen in India peoples was not able to get proper food during the Covid-19. If Covid-19 cases can be predicted that will help the government to prepare the bed for patients and prepare transportation and supply regular food in advance by using prediction software then this will be a lot of help of government and it will also ease in handling the upcoming cases.

Machine learning has achieved the milestone in predicting the results, what ML really does is – it is capable to predicting future data using the past data with the help of various algorithms . Machine learning is capable of having artificial human behaviour which can help in solving maths and doing probability.

Here are some related paper work

1*Forecast and prediction of COVID-19 using machine learning.

Author -Deepak Painuli, Divya Mishra,

In this project the system is depended on the given data sets from different departments. So this cannot be 100% accurate.

But in the future work by combining the new factors and algorithms with AIRMA we can get more accurate results. (Deepak Painuli 2021)

2* PREDICTION OF COVID-19 USING MACHINE LEARNING TECHNIQUES

Author - Durga Mahesh Matta, Meet Kumar Saraf

In this project Support Vector Machine (SVM), Artificial Neural Networks (ANNs) and Random Forests (RF) were taken , to make a bit proper and accurate model using these models to predict corona victim reports.

As for the future work they have been in a problem because it can damage mankind through socio-economy and cultural factors.(Patibandla, Rao, and Narayana 2022)

3*RECURRENT NEURAL NETWORK AND REINFORCEMENT LEARNING MODEL FOR COVID-19 PREDICTION

Author:- R. Lakshmana Kumar, Firoz Khan,

In this project DL-based prediction method is used for forecasting the risk of COVID-19.

The project analyse the day to day datasheets and use deep learning algorithm to make prediction for upcoming days.

In the further studies they advise to use semi-supervised hybrid design to identify COVID-19.(R. Lakshmana Kumar1 et al. 2021)

4*PREDICTING THE DISEASE OUTCOME IN COVID-19 POSITIVE PATIENTS THROUGH MACHINE LEARNING: A RETROSPECTIVE COHORT STUDY WITH BRAZILIAN DATA

Author:-Fernanda Sumika Hojo De Souza

In this project Artificial intelligence models are used to aiming to identify the risk for prognostic prediction of severe COVID-19, using age factor, clinical factor, laboratory tests and chest imaging.

The database war from a State (Espírito Santo) of Brazil. As future work they want to use deep learning and other ensemble learning methods to enhance its prediction.(Fernanda Sumika Hojo De Souza 1 et al. 2021)

In this paper what we are really doing is we will predict the number of cases for coming month's so that the government can prepare in advance to tackle the covid-19 outcomes.

II. LITERATURE REVIEW/BACKGROUND WORK

Many people from around the globe and from all over the India have done work in covid-19 prediction software using ML and have achieved good results

H. Zhao had also done work in short term prediction model using daily incident data. He used previous 7 days data to predict upcoming cases of covid-19. The results are shown in graph.

D. Painuli also used ML to forecast and predict covid-19. He used ARIMA, extra tree classifier, ML, Time series, random tree classifier to predict the covid-19 cases. [(Hongwei Zhao et al. 2021)]

M. Mondal had also used ML and deep learning to predict the data of covid-19 cases, he used AI, computed tomography, and transfer forecasting in his paper to predict the data, the results were in residual neural network. [(Aggarwal et al. 2021)]

Many scholars have also used ML techniques to predict the covid-19 cases and have achieved decent output here is list of some work on covid-19 prediction paperwork using Machine learning.

Name	Dataset	Method	Summary	Reference
Mahdi Mahdavi, HadiChoubdar, ErfanZabeh	A machine learning based exploration of COVID-19 mortality risk	Transparent Reporting of a multivariable prediction model for individual prognosis or diagnosis (TRIPOD) support vector machine is used in it too.	In this project speed of processing and image featuring problem was there. This was for the further future study	[(Mahdavi et al. 2021)]
Deepak Painuli, Divya Mishra, Suyash Bhardwaj,,Mayank Aggarwal	Forecast and prediction of COVID-19 using machine learning	Training data were used to train the ML classifier	It was a bit time taking process, but the accuracy is pretty good so in future working on speed too.	[(Prakash 2020)]
Kolla Bhanu Prakash , S. SagarImambi , Mohammed Ismail , T Pavan Kumar, YVR Naga Pawan	Analysis, Prediction and Evaluation of COVID-19 Datasets using Machine Learning Algorithms	COVID-19, Decision Tree Classifier, Gaussian Naïve Bayesian Classifier, KNN+NCA, Logistic Regression, Machine Learning,, Multilinear Regression, SVM, XGBoost Classifier	A good success in there project. Results were slim to accurate.	[(Satu et al. 2021)]
Md. ShahriareSatu, Koushik Chandra Howlader, Mufti Mahmud	Short-Term Prediction of COVID-19 Cases Using Machine Learning Models	Support Vector Machine (SVM), Machine Learning	It was basically a cloud based machine learning forecast for predicting covid-19 infected people.	

III. METHODOLOGY

1.1 Regression Model

Basically it is a relationship between one or more independent variable and response. This is mainly used for decision making. Three major reasons to use regression analysis are determining the strength of predictors, forecasting an effect, trend forecasting

There are 6types of regression in total:

- Linear Regression
- Polynomial Regression
- Stepwise Regression

-Lasso Regression

-ElasticNet Regression

1.2 SVM for Regression

Full form of SVM is “Support Vector Machine” and is an supervised machine learning algorithm used for classification and regression from both of which regression is mainly used for the model. It can solve many linear and non-linear problems and is very useful for many real life problems.

1.3 Dataset

We have taken database from the live API in which cases added on daily basis . Three main types of data are used such as: Confirmed Cases, Death Cases and Recovered Cases. For the analysis of the database many user defined functions. Many types of graphs, pie-charts, bar-chart and tables are used to show the processed data.

1.4 Proposed Framework

Plot function: This is a pre defined function mainly used for plotting many types of graphs an bar charts. Many types of plotting are also used in in this report also to analyses and to show the outcomes of the processed database. Plotting makes easier to present the form of data in easier manner.

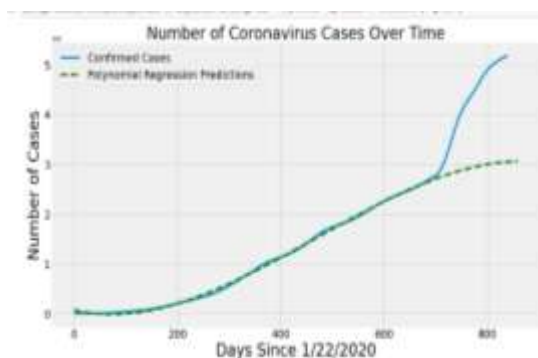
There are many prediction models available in the market but all of these are made from linear regression and are not that much accurate. So, SVM is used in this model to generate more accuracy because this also is very helpful to deal with real-life problems.

IV. RESULT ANALYSIS

1.5 Experimental Setup

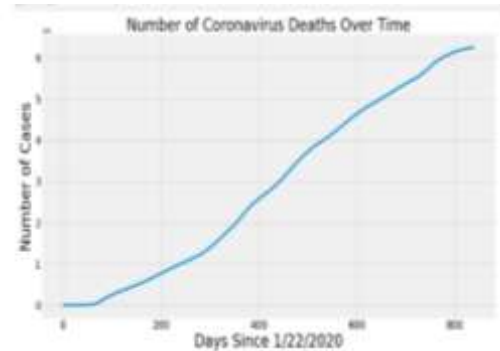
This model is created with the help of raw data (which is “No of cases on daily basis”) upcoming prediction and comparisons has been made through the research. These comparisons are shown below in the result section.

1.6 Experimental Results

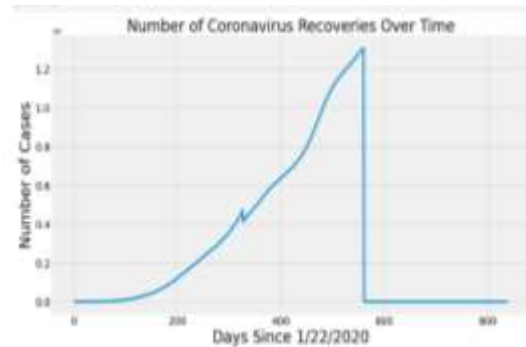


In this prediction the straight line shows the number of cases and the dotted line shows the Predicted data at the end both lines are diverting because we are not getting proper data from the government since Dec-2021 that’s why proper prediction is not able to make.

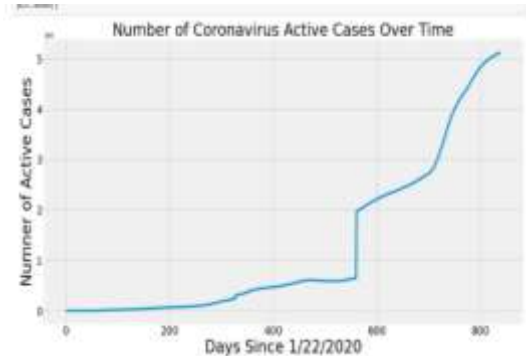
Below graphs represents the data of different types



This graph shows the number of covid-19 deaths over time

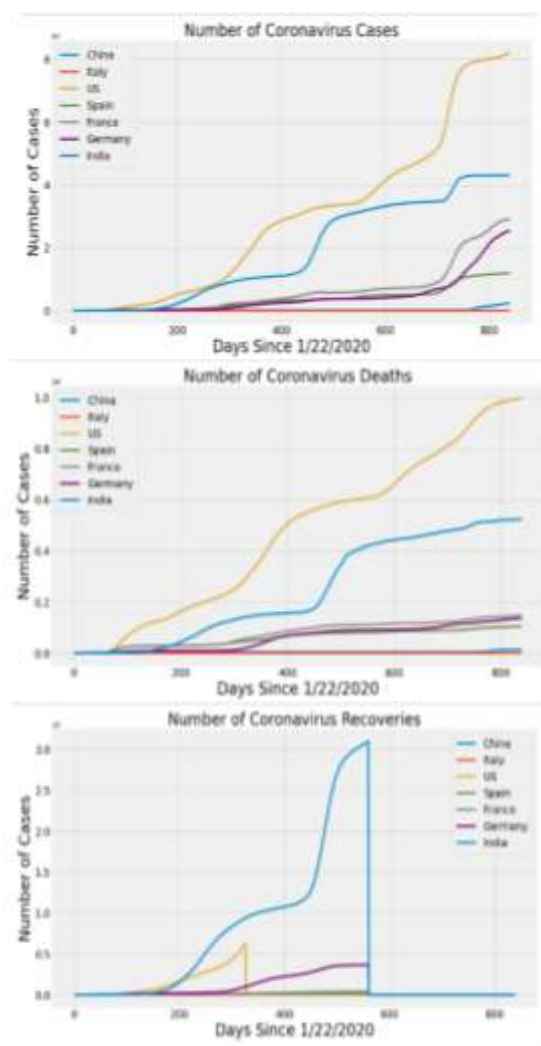


This graph shows the number of covid-19 recoveries over time



This grapg shows the number of covid-19 active cases over time

Here are some raphs which shows the number of active cases, deaths and recoveries of different countries over time.



V. CONCLUSION

Covid-19 prediction using ML is created by most of people now a days, what makes our paperwork different is that we get the accuracy of 90% and in this paperwork a user can see various graphs that make it easy for user to understand the information about Covid-19 cases and also user can see different graphs that are used to compare difference between increase in number Covid-19 cases.

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