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COVID-19 Epidemic Analysis using Deep Learning

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Abstract: In 2019, our world was struck by a global COVID-19 pandemic which belongs to the Coronavirus family. the coronavirus disease (COVID-19) outbreak has caused many death cases and affected all sectors of human life. With gradual progression of time, COVID-19 was declared by the world health organization (WHO) as a pandemic, which has led to increase in the significant burden on the majority countries, especially ones with poor health conditions and ones with slow responses. Here, we introduced a model that might be helpful to predict the spread of COVID-19. we've performed direct relapse, Multilayer perceptron and Vector auto regression strategy for want on the COVID-19 Kaggle dataset to examine the epidemiological case of the infirmity and pace of COVID-19 cases. Since the COVID-19 pandemic has spread worldwide, real-time analysis of epidemiological data is needed to help equip society with disease-fighting strategies.

Keywords: Covid-19, Pre-Processing, Classifier Algorithm, Feature Extraction, Convolutional Neural Network (CNN), etc.

I. INTRODUCTION

Worldwide, the spread of coronavirus has disturbed the working of life in general. All were pushed to stay back to shield from the terrifying transmission. More caution was required for the older and invulnerability less individuals. The segment of the contaminated individuals in India demonstrates that 39 years is the middle. Relatively, individuals somewhere within the range of 21 and 40 years are more affected by the virus. The prevalence data of COVID-19 dated January 22, 2020, to April 10, 2020, was accumulated from Kaggle. Weka and Orange are employed to unravel the info. Since the publication of the novel COVID-19, the planet has been frantically fighting for its cause. according to the Johns Hopkins dashboards globally circulated live data as of April 1, 2020, there are 932,605 cases are confirmed worldwide, of which 193,177 are recovered from virus and 46,809 have died due to virus. COVID-19 is a member of the SARS-CoV and MERS-CoV families, with symptoms starting from a standard cold to extreme respiratory disorders characterized by difficulty breathing, fatigue, fever, and a dry cough. it was discovered that imaging with immunoelectron microscopy techniques would enhance virus identification.

II. OBJECTIVE

The properties of orthogonal moment features and feature selection techniques are used to propose a COVID-19 classification method. The project's goal is to strengthen India's national health systems for preparedness by preventing, detecting, and responding to the COVID-19 threat.

III. RELATED WORK OR LITERATURE SURVEY

[1] “Cross-Cultural Polarity and Emotion Detection Using Sentiment Analysis and Deep Learning on COVID-19 Related Tweets”

Author: ALI SHARIQ IMRAN

How different cultures react and respond given a crisis is predominant in a society’s norms and political will to combat the situation. Often, the decisions made are necessitated by events, social pressure, or the need of the hour, which may not represent the nation’s will. While some are pleased with it, others might show resentment Corona virus sentiment prediction

[2] COVID-19 Outbreak through Tweeters’ Words: Monitoring Italian Social Media Communication about COVID-19 with Text Mining and Word Embeddings

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In this paper we aim to analyze the Italian social media communication about COVID-19 through a Twitter dataset collected in two months. The text corpus had been studied in terms of sensitivity to the social changes that are affecting people's lives in this crisis. In addition, the results of a sentiment analysis performed by two lexicons were compared and word embedding vectors were created from the available plain texts.

[3] COVID-19 Sensing: Negative Sentiment Analysis on Social Media in China via BERT Model

Author: TIANYI WANG, KE LU, KAM PUI CHOW, AND QING ZHU

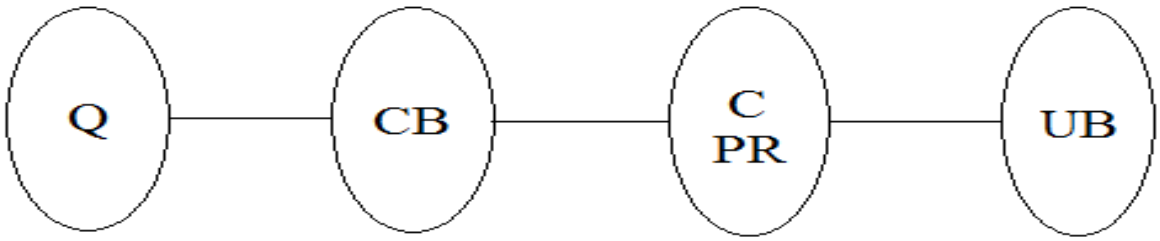
Coronavirus disease 2019 (COVID-19) poses massive challenges for the world. Public sentiment analysis during the outbreak provides insightful information in making appropriate public health
responses. On Sina Weiboa, a popular Chinese social media, posts with negative sentiment are valuable in analyzing public concerns. 999,978 randomly selected COVID-19 related Weibo posts from 1 January 2020 to 18 February 2020 are analyzed

[4] Sentiment Identification in COVID-19 Specific Tweets

Author: Manoj Sethi, Sarthak Pandey, Prashant Trar, Prateek Soni

In 2020, our world has been hit by a global pandemic of COVID-19, belonging to the family of Coronavirus. Due to the rapid increase in the infection and the death rate, people have started to develop mixed feelings regarding this situation. Therefore, in this study, our sole focus is to analyze the emotions expressed by people using social media such as Twitter etc.

IV. MATHEMATICAL MODELING



Where,
Q = User entered input
CB = preprocess
C = feature selection
PR = preprocess request evaluation
UB = predict outcome

SET THEORY

1) Let S be as machine which input image
S = {In, P, Op, Φ}

2) Identify Input In as
In = {Q}
Where,
Q = User entered input image(dataset)

3) Identify Process P as
P = {CB, C, PR}
Where,
CB = Preprocess
C = feature selection
PR = Preprocess request evaluation

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4) Identify Output Op as
Op = {UB}
Where,
UB = Predict outcome
Φ=Failures and Success conditions.

FAILURES:
1. Huge database can lead to more time consumption to get the information.
2. Hardware failure.
3. Software failure.

SUCCESS:
1. Search the required information from available in Datasets.
2. User gets result very fast according to their needs.

SPACE COMPLEXITY:
The space complexity is dependent on visualization of discovered patterns. Higher storage of data leads to higher space complexity.

TIME COMPLEXITY:
No. of patterns available in the datasets= n
If (n > 1) then retrieving of information can be time consuming.
So, the time complexity of this algorithm is $O(n^n)$.

Above mathematical model is NP-Complete.

V. EXISTING SYSTEM AND DISADVANTAGES

In existing system there is no computerized system to identify the Covid-19 disease. The max operator has at least two disadvantages. Firstly, it is only suitable for the instance-level approaches that require an instance classifier, as we mentioned before, existing popular approaches of MIL with neural networks are treat separated instances as inputs, then use a deep neural network to transform them into embedding space

DISADVANTAGES: The max operator has at least two disadvantages. Firstly, it is only suitable for the instance-level approaches that require an instance classifier

VI. ADVANCED SYSTEM AND ADVANTAGES

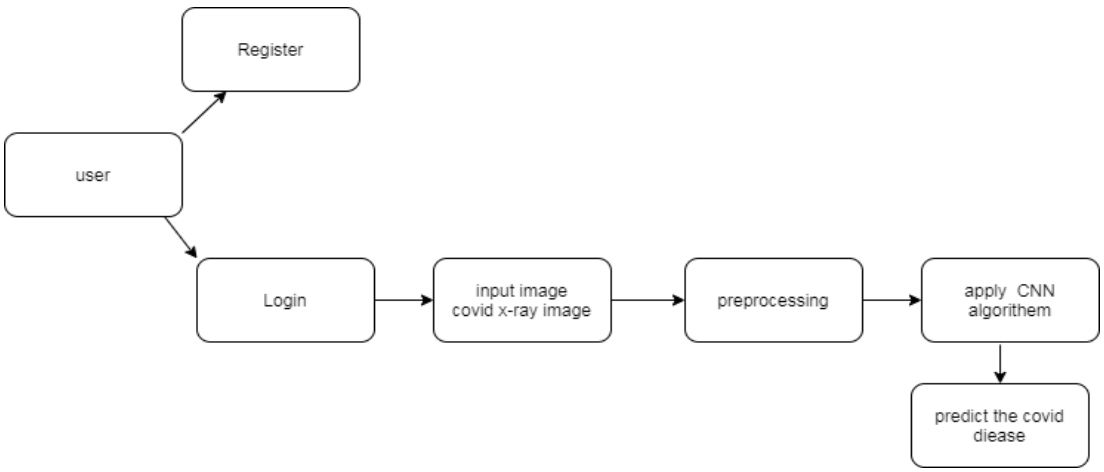

Figure: Advance System Architecture

ADVANTAGES: It's critical to confirm who's infected in order to effectively manage and contain the virus. It would be difficult to determine the actual rates of cases without reliable testing. As a result, it's critical to understand what these tests can and can't do in order to use them effectively. System that is both secure and efficient.

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ALGORITHM

CNN:

- A Convolutional Neural Network (ConvNet/CNN) is a Deep Learning algorithm which can take in an input image, assign importance (learnable weights and biases) to various aspects/objects in the image and be able to differentiate one from the other.
- CNNs are used for image classification and recognition because of its high accuracy. ... The CNN follows a hierarchical model which works on building a network, like a funnel, and finally gives out a fully-connected layer where all the neurons are connected to each other and the output is processed
- One of the main parts of Neural Networks is Convolutional neural networks (CNN). ... They are made up of neurons with learnable weights and biases. Each specific neuron receives numerous inputs and then takes a weighted sum over them, where it passes it through an activation function and responds back with an output.
- There are three types of layers that make up the CNN which are the convolutional layers, pooling layers, and fully-connected (FC) layers. When these layers are stacked, a CNN architecture will be formed

TECHNIQUE

IMAGE PREPROCESSING

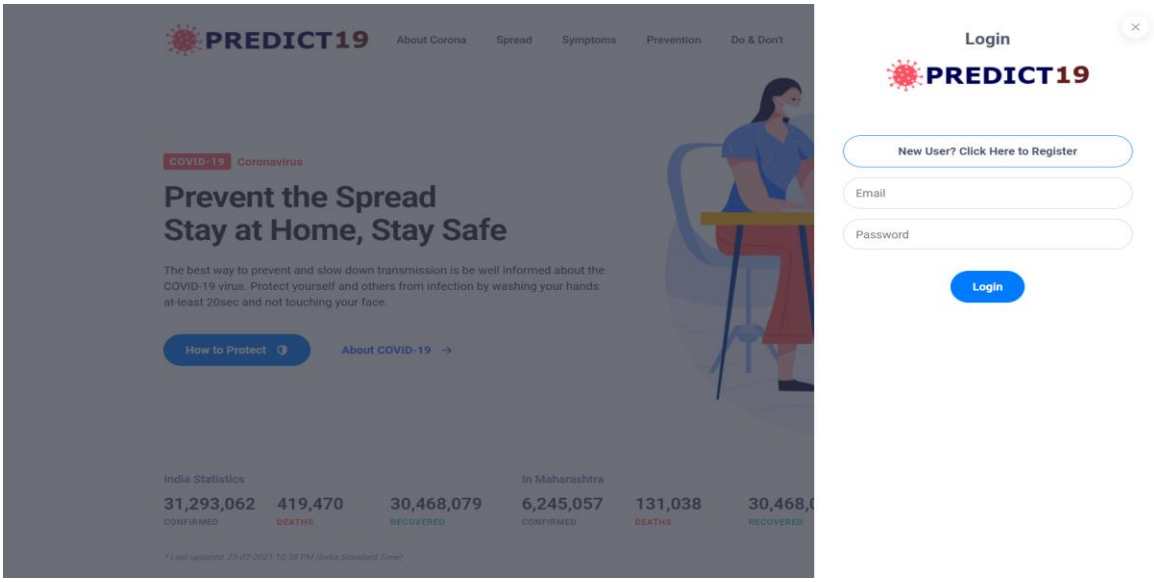
- Image pre-processing is the name for operations on images at the lowest level of abstraction whose aim is an improvement of the image data that suppress undesired distortions or enhances some image features important for further processing. It does not increase image information content.
- Local illumination can be enhanced using gradient filters, local histogram equalization, and rank filters. Blur and focus enhancements. Many well-known filtering methods for sharpening and blurring may be employed at the pre-processing stage

VII. CONCLUSION AND FUTURE WORK

This paper presents the dominance of the DL (deep learning) method over the classical ML (machine learning) algorithms. Both the simplicity of the approach and the achieved accuracy confirm that the DL is the way to follow for image classification problems with relatively large datasets. As the achieved accuracy of the DL method is already very high, trying to improve its results on the same dataset would be of little benefit. Further work with the DL model could be done by expanding the dataset with more diverse images, collected from multiple sources, in order to allow it to generalize better.

SCREENSHOT OUTPUT

LOGIN



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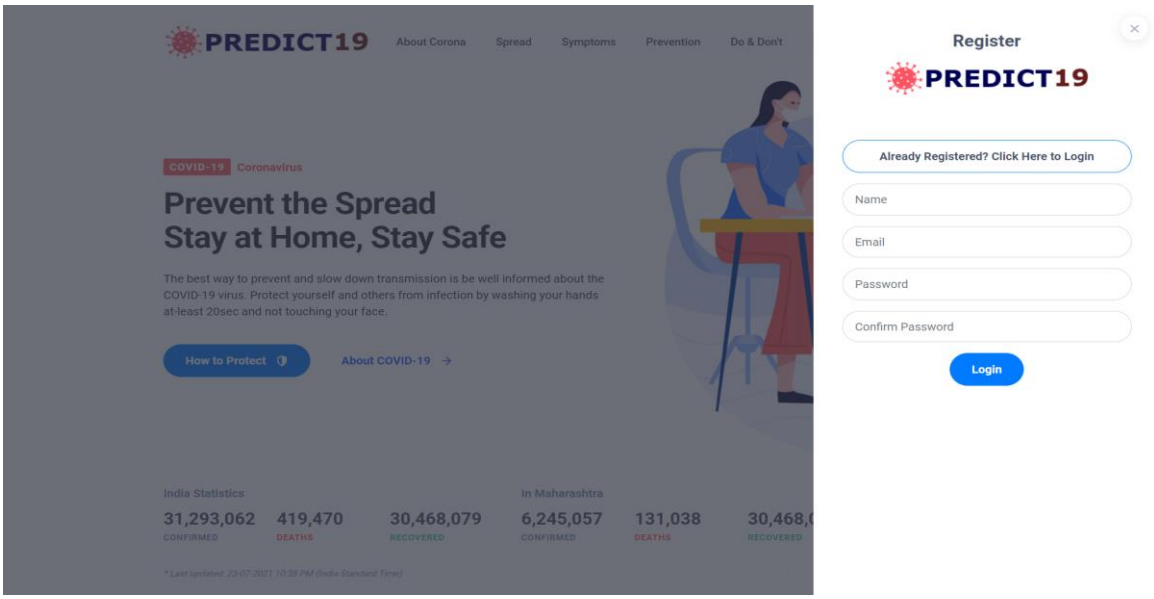
REGISTER



DASHBOARD

VIII. CONCLUSION

The coronavirus disease continues to spread round the world on an unpredictable path. The speed and strength of recovery are going to be determined by countries' health, humanitarian, and socioeconomic policies. The four-pillar policy framework presented in this brief by the International Labour Organization (ILO) provides guidance not only for countries as they progress through the various stages of the crisis, but also for the international community at large.

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