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# Multi feature extraction based and Euclidean Similarity based severity prediction of COVID-19

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**Abstract**: As we all know that Corona Virus is rise of COVID-19 pandemic communicable disease. it absoluately was first identified in Wuhan in December 2019. It expanded its circle everywhere the globe and eventually spreading its route to India. the full world is fighting against the spread of this deadly disease, cases in India also gradually increasing day by day since May after lockdown. This paper proposes a way to contribute to utilizing the machine learning and deep learning models with the aim for understanding its everyday exponential behavior together with the prediction of future reachability of the COVID-2019 across the nations by utilizing the real-time information from the Johns Hopkins. This paper studies the COVID-19 dataset and explore the information by data visualization with different libraries that are available in Python. The paper also discusses this situation in India while tackling the Covid-19 pandemic and also the ongoing development in AI and ML has significantly improved treatment, medication, screening tests, prediction, forecasting, contact tracing, and drug/vaccine development process for the Covid19 pandemic and reduce the human intervention in practice.

**Keywords— Pandemic, Artificial Intelligence, Machine Learning.**

## I. INTRODUCTION

The whole world is facing a health crisis, that's unique in its kind, because of the COVID-19 pandemic. because the corona virus continues spreading, researchers are concerned by providing or help provide solutions to save lots of lives and to prevent the pandemic outbreak. Among others, computer science (AI) has been adapted to deal with the challenges caused by pandemic. during this paper, we design a deep learning system to extract features and detect COVID-19 from chest X-ray images. Three powerful networks, namely ResNet50, InceptionV3, and VGG16, are fine-tuned on an enhanced dataset, which was constructed by collecting COVID-19 and normal chest X-ray images from different public databases.

We applied data augmentation techniques to artificially generate an oversized number of chest X-ray images: Random Rotation with an angle between −10 and 10 degrees, random noise, and horizontal flips. Experimental results are encouraging: the proposed models reached an accuracy of 97.20% for Resnet50, 98.10% for InceptionV3, and 98.30% for VGG16 in classifying chest X-ray images as Normal or COVID-19. The results show that transfer learning is proven to be effective, showing strong performance and easy-to-deploy COVID-19 detection methods.

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## II. LITERATURE REVIEW

In paper Apostolopoulos ID, Mpesiana TA (2020)[1] Covid-19: automatic detection from x-ray images utilizing transfer learning with convolutional neural networks. He developed an automatic model for COVID-19 detection by using Chest X-ay images. Under this model they did two types of classification i.e. Binary classification

Gazzah S, Bencharef O (2020)[2] A Survey on how computer vision can response to urgent have to contribute in COVID-19 pandemics proposed a model named "CoroNet," which may be a CNN model for COVID-19 diagnosis using radiography images of chest. The suggested method relies on the "Xception Architecture" which could be a pre-trained model with the dataset of ImageNet then it's trained on a dataset that was gathered from various publically accessible databases for research purpose.

Axell-House DB, Lavingia R, Rafferty M, Clark E, Amirian ES, Chiao EY (2020)[3] The estimation of diagnostic accuracy of tests for COVID-19: A scoping review They used 3 different binary classifications algorithms by using 5-fold cross validation with 4 classes as follows (COVID-19, bacterial pneumonia, normal and, virus infection

Chest X-ray classification using Deep learning for automated COVID-19 screening[4] The classification on chest X-Ray s images and designed a classification model which focused on accurate diagnosis of COVID-19. Their dataset contained the chest Xrays images that were divided into 4 classes are as follows tuberculosis (TB), pneumonia, COVID-19 and normal. They used VGG16 model which achieved the precision was 95.9 percent.

Eurosurveillance Editorial Team (2020)[5] Note from the editors: World Health Organization declares novel coronavirus (2019-nCoV) sixth public health emergency of international concern.they explain Eurosurveillance 25(5): 200131e China CDC assesses the transmissibility of this virus to be sufficient for sustained community transmission without unprecedented control measures. Further cases and deaths in China are expected within the coming days and weeks. Further cases or clusters also are expected among travellers from China, mainly Hubei province. Therefore, health authorities within the EU/EEA Member States should remain vigilant and strengthen their capacity to reply to such a good.

## III. DECENTRALIZED CERTIFICATE SYSTEM

As the number of corona virus patients are increasing day by day then we need a fast and an efficient method to diagnose a patient and where Artificial Intelligence is the best solution for diagnosis. The Artificial Intelligence is useful because we can give a set of images together and it will give us more accurate.System determine prediction of Corona Virus test using Chest X-Ray.

**Working:**

Interpretable Machine Learning system is based on multi feature technology. The system's application will be programmed on the public data. In the system, four steps are involved. Image pre-processing, Feature Extraction ,Feature Selection Algorithm ,Pattern Classification

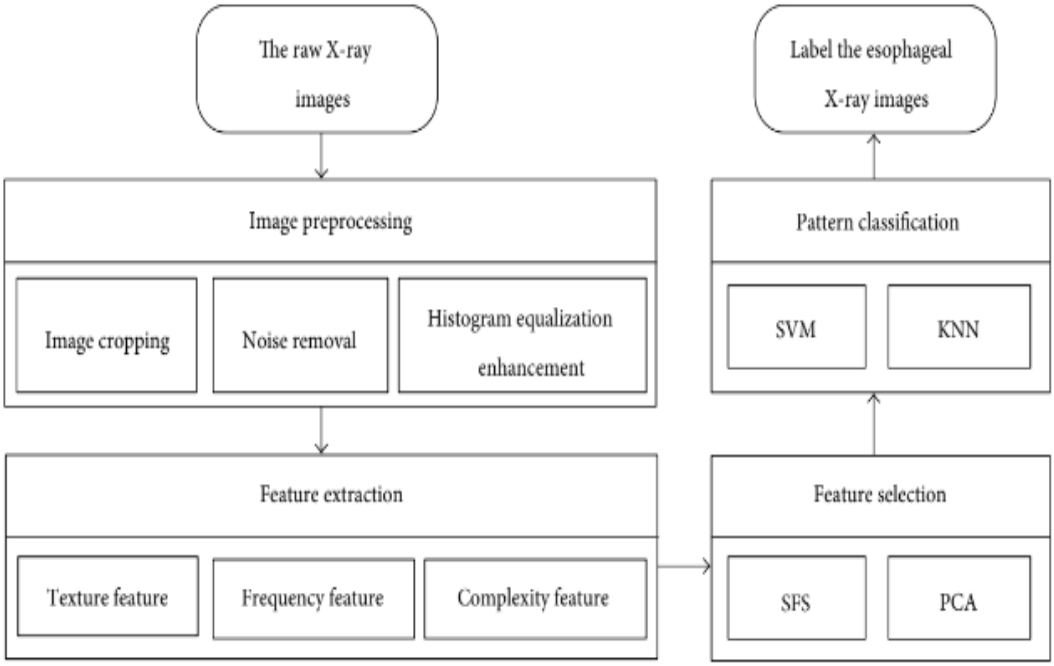


Fig 1.System Diagram

Following is the working process of the system that is developed in this study:

1) When an X-Ray image is come in system First step of system is Image preprocessing. in this process format images before they are used by model training and inference. This includes, but is not limited to, resizing, orienting, and color corrections.

2) In image process cropping, noise removal and histogram equalization enhancement steps are done.

3) After that feature extraction process is come. in texture feature , frequency feature, complexity feature processes is happen. in texture feature extraction spatial variation of the brightness intensity of the pixels. Texture is the main term used to define objects or concepts of a given image.

4) In Feature extraction is a part of the dimensionality reduction process, in which, an initial set of the raw data is divided and reduced to more manageable group.

5) In Feature selection SFS and PCA technique are used. SFS based on used of self ration image and PCA allows the identification of standards in data and their expression in such a way that their similarities and differences are emphasized.

6) After that image is go through pattern selection process in this process SVM and KNN technique are used where in SVM trains on a set of label data. The main advantage of SVM is that it can be used for both classification and regression problems. SVM draws a decision boundary which is a hyper plane between any two classes in order to separate them or classify them. SVM also used in Object Detection and image classification.

7) Where KNN classifies unknown data points by finding the most common class among the k closest examples.

8) After all these process the final output declared that the given X Ray image is Corona Positive or negative patient.

Here main aim of this system is to improve treatment methods and health management as well as recognition and diagnosis. It will improve the speed and accuracy of diagnosis, develop fresh, effective therapeutic approaches that will help patient to discover corona virus.

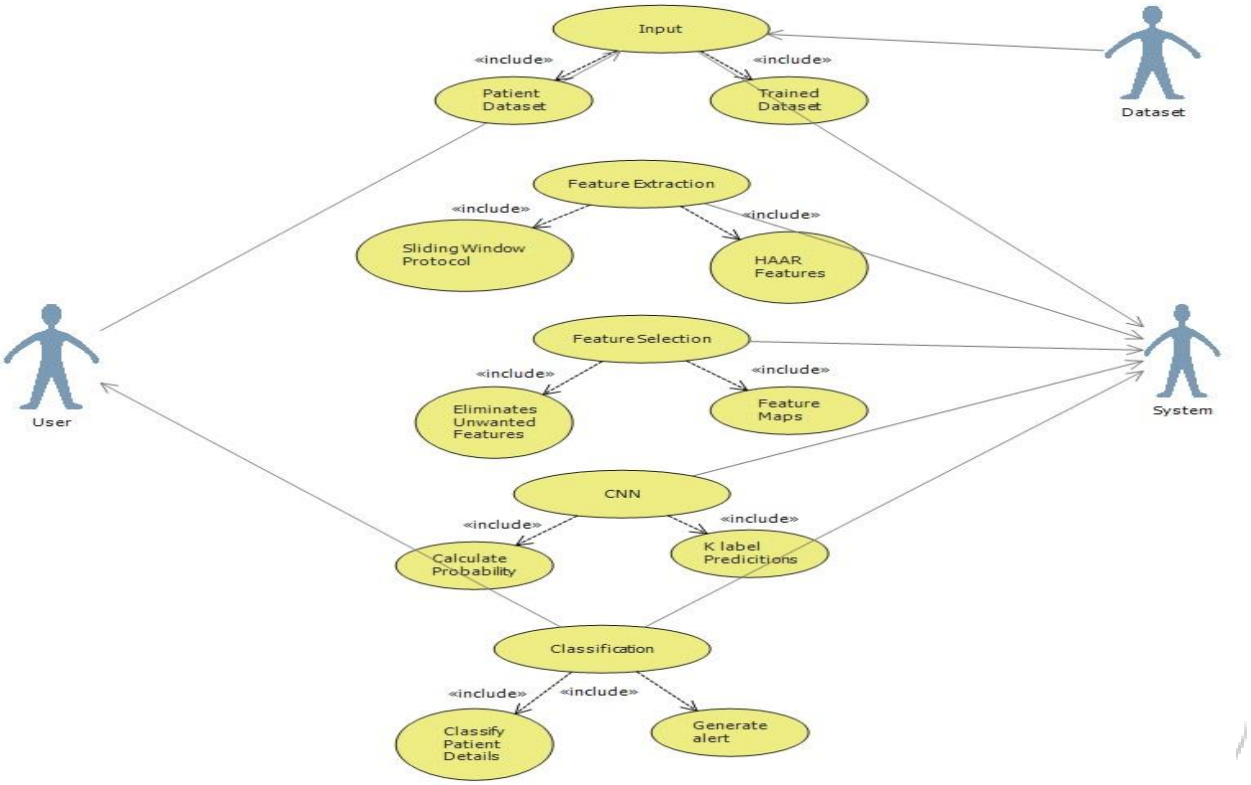


Fig.2.UML diagram

## IV. CONCLUSION

This is very helpful in a very pandemic, especially when the available health resources don't match the burden of disease also because the need for preventive measures to be taken. Research in deep learning always strives to make better representations of reality and to form models capable of learning these representations from non-labeled data on an oversized scale

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