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Covid 19 Detection Using Deep Learning and Covid 19 Symptoms Checker

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Abstract--The goal of this project is to classify healthy individuals, COVID-19 cases, and viral pneumonia cases. Deep learning is a type of machine learning. It enables us to teach artificial intelligence to anticipate outcomes given a set of data.Artificial intelligence can be trained through supervised learning. Voice and facial recognition, disease diagnosis, defence, and security are all domains where deep learning is applied. Artificial neuralnetworks are represented by the word deep in deep learning. The human brain inspired artificial neural networks. It is made up of neurons, just like the human brain. The amount and speed of learning are the main differences between them. To put it another way, artificial neural networks require data and processing capacity to be trained. The quality of machine learning methods is determined by the algorithms used.

KEYWORDS: COVID-19, Privacy Preserved DataSharing, deeplearning, Symptoms checker

I. INTRODUCTION

This study will classify healthy individuals, COVID-19 cases, and viralpneumonia cases. Deep learning is a kind ofmachine learning. It enables us to train artificial intelligence to predict outcomes based on a particular data set. Artificial intelligence can be trained through supervised learning. Deep learning isemployed in areas such as voice and face recognition, disease detection, defence, and security. Artificial neural networks are represented by the word "deep" in deep learning. The human brain serves as inspiration for artificial neural networks. It's made up of neurons, just like the humanbrain. The amount and speed with whichthey learn differs. To put it another way, artificial neural networks require a data set and computing power to be trained. The quality of machine learning methods is determined on the algorithm used.

II. EXISTING SYSTEM

This research is based on linear regression and SVM (Support Vector Machine), as mentioned previously. Existing Machine Learning Algorithm-based System There are certain drawbacks of employing the ML algorithm.

III. METHODS IN MACHINE LEARNING

A Convolutional Neural Network in a Deep Learning system can take an input image, assign relevance (learnable weights and biases) to various aspects in the image, and distinguish between them.

A. Convolution layer

A convolution layer transforms the input image in order to extract features from it. In this transformation, the image is convolved with a kernel A kernel is a small matrix, with its height and width smaller than the image to be convolved. It is also known as a convolution matrix or convolution mask. The convolutional layer is the core building block of a CNN, and it is where the majority of computation occurs. It requires a few components, which are input data, a filter, and a feature map.

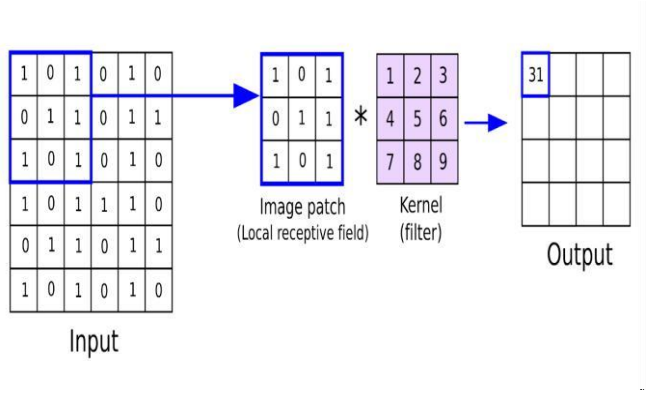


Figure1 Convolution Matrix

B. Pooling Layer

Down sampling, also known as pooling layers, is a dimensionality reduction technique that reduces the number of factors in the input. The pooling process sweeps a filter across the entire input, similar to the convolutional layer, however this filter does not have any weights. Instead, the kernel uses an aggregation function to populate the output array from the values in the receptive field.

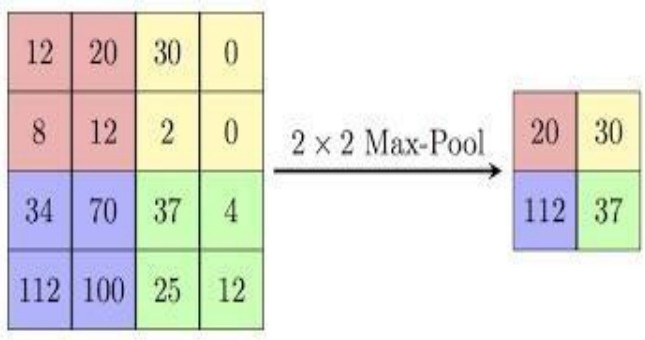


Figure 2 Down sampling

C. Flattern Layer

The full-connected layer's name is self-explanatory. In partially linked layers, the pixel values of the input image are not directly connected to the output layer, as previously stated. Each node in the output layer, on the other hand, connects directly to a node in the previous layer in the fully- connected layer. This layer performs classification tasks based on the features retrieved by the previous layers and their various filters.

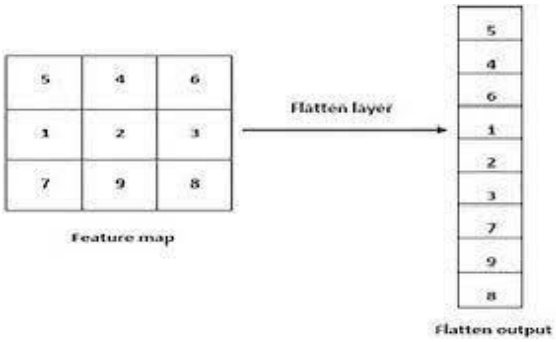


Figure 3 Flattern Layer output

D. Dense Layer

The Dense layer's name is a good description of what it is. In partially linked layers, the pixel values of the input image are not directly connected to the output layer, as previously stated. Each node in the output layer, on the other hand, connectsdirectly to a node in the previous layer in the fully-connected layer. This layer performs classification tasks based on the features retrieved by the previous layers and their various filters.

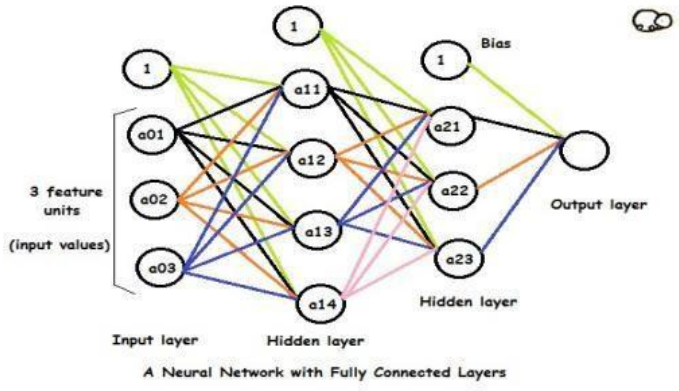
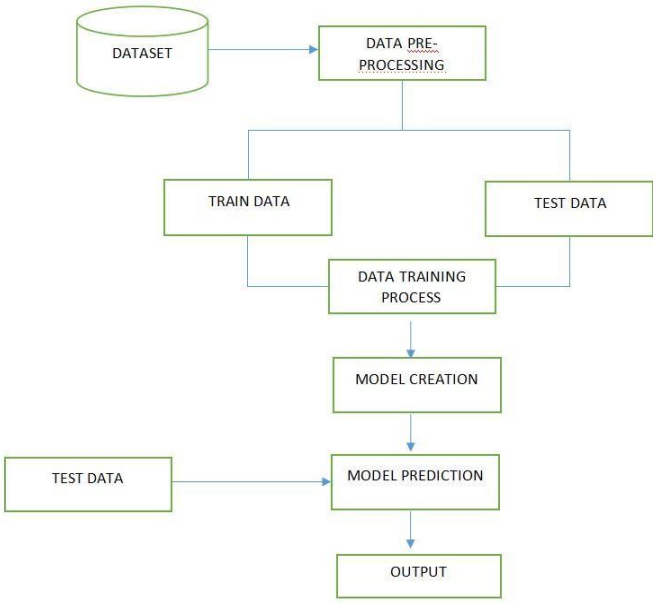


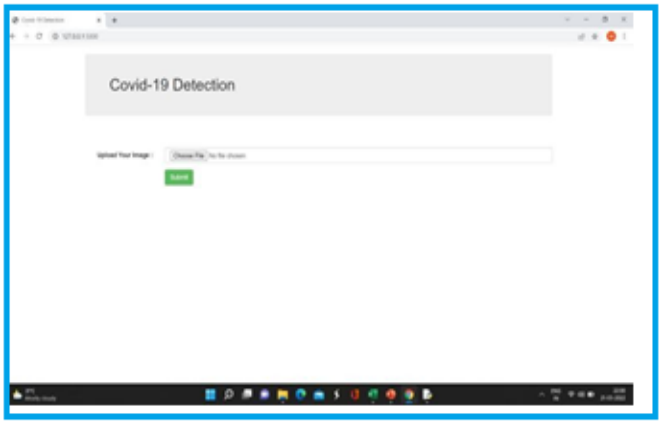
Figure 4 Dense Layer output

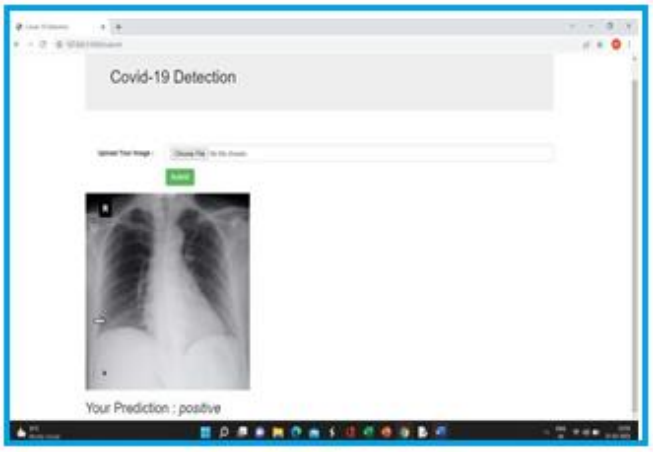
IV. PROPOSED METHODOLOGY



The chest x-ray dataset was subjected to a deep learning algorithm called CNN. The article made use of the Tensor flow and Keras Python libraries. Adam was employed as an optimizer in the four deep learning models, and Relu and softmax were used as activation functions.

V. RESULTS





The above figures show the output. The output shows that input specimen from covid positive patient.

CONCLUSION

Deep learning methods were used to analyze 657 chest X-ray pictures for the diagnosis of COVID-19. The data augmentation technique has boosted this figure. Thefindings of the literature demonstrate that deep learning is critical in fighting the COVID-19 outbreak.

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