Module : Deep Learning Project

Project Title: COVID 19 Lung Damage Detection using Convolutional Neural Networks and Data Augmentation

The aim of this study is to give knowledge about the COVID-19 lungs damage problem by Convolutional Neural Network (CNN) and Data Augmentation. Here we are going to classify the X-ray images of lungs whether there infected by Covid-19 or not by using Convolutional Neural Networks.

- To understand the symptoms, treatment, and precautions of COVID-19.

- To identify the lungs damage problem where we are going to recognize the damage on the lungs.

- To collect the X-ray images of Lungs which are positive and negative cases.

- To review and understand the technique of Convolution Neural Network, we can go with whole training or I can use pretrained models.

- To describe the scope of data augmentation, where we can increase the images to enhance the accuracy and robustness of our model.

- To classify the new class with just one X-ray images of lung. Then we can identify that person has Covid-19 or not.

Tasks to be performed:

1. Data Preprocessing
    - Data Reading
    - Data Visulaization
    - Feature Extraction
    - Standardisation / Normalization
2. Data Augmentation.
    - Rotation
    - Flipping
    - Zooming
    - Horizontal/vertical shift
3. DataFrame Creation
4. Train Test Split
5. Model Building
    - CNN Model
    - Use Callbacks(ReduceLROnPlateau)
    - Model Fitting

6. Model Evaluation
    - Confision Matrix
    - Accuarcy and Loss Visauliazation
7. Testing / Predicting on new images

Download the dataset from the below link:
Chest X-Ray Images (Pneumonia) | Kaggle

Challenges to be done:

1.Apply transfer learning models

a) VGG16
B) VGG19
C) Resnet 50
D)Resnet 101
e)Resnet 152

Note : Apply any three models atleast and find the best model

Note: For any doubts clarifications,Join the mentor session from 2:00 pm to 6:00 pm

Thanks and Regards,
Innomatics.