Project Proposal

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Introduction and Problem Statement:

Pneumonia is one of the most common diseases of lungs. The diagnosis of pneumonia is usually based on interpretation of chest X-ray of a patient by the expert. The interpretation of chest X-ray is time consuming, varies by expert, and can be error prone.

Project overview and Methodology:

Our group will be using the "Chest X-ray Images (Pneumonia)" dataset from Kaggle to classify whether the X-ray image is of Pneumonia or No Pneumonia using image based deep learning. The aforementioned data set has data on 5856 X-ray images. Chest X-ray Images dataset is a labelled dataset with two categories. Viz. "Pneumonia" and "No Pneumonia".

Using a convolutional neural network deep learning technique, our group will build the transfer learning models to classify whether the given X-ray is normal ("No Pneumonia") or is of Pneumonia ("Pneumonia"). We are planning to implement VGG16, InceptionV3 and ResNet50 models on a training dataset for this image classification project. The model with the best accuracy score will be chosen as the best model and will be used on the test dataset.

Project Plan:
1. We have already downloaded the datasets and its metadata from Kaggle (https://www.kaggle.com/paultimothymooney/chest-xray-pneumonia).
2. The downloaded dataset will be loaded into Jupyter notebook.
3. Exploratory Analysis and Exploratory Visualization will be performed.
4. Balancing the dataset (if required)
5. Building the classifiers / models.
6. Interpret the results of models.
7. Present the findings.

References:
1. Data Source: https://www.kaggle.com/paultimothymooney/chest-xray-pneumonia
2. G. Labhane, R. Pansare, S. Maheshwari, R. Tiwari and A. Shukla, "Detection of Pediatric Pneumonia from Chest X-Ray Images using CNN and Transfer Learning," 2020 3rd International Conference on Emerging Technologies in Computer Engineering: Machine Learning and Internet of Things (ICETCE), Jaipur, India, 2020, pp. 85-92, doi: 10.1109/ICETCE48199.2020.9091755.

3. H. Sharma, J. S. Jain, P. Bansal and S. Gupta, "Feature Extraction and Classification of Chest X-Ray Images Using CNN to Detect Pneumonia," 2020 10th International Conference on Cloud Computing, Data Science & Engineering (Confluence), Noida, India, 2020, pp. 227-231, doi: 10.1109/Confluence47617.2020.9057809.

4. Ambita A.A.E., Boquio E.N.V., Naval P.C. (2020) Locally Adaptive Regression Kernels and Support Vector Machines for the Detection of Pneumonia in Chest X-Ray Images. In: Nguyen N., Jearanaitanakij K., Selamat A., Trawiński B., Chittayasothorn S. (eds) Intelligent Information and Database Systems. ACIIDS 2020. Lecture Notes in Computer Science, vol 12034. Springer, Cham