**Project Proposal**

**Group Members:**

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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