Proposal Description

Project Description:

This project aims to develop an classification system for the diagnosis of pneumonia using chest X-ray images. Leveraging Deep learning techniques, the proposed system will analyze X-ray images to distinguish between normal cases and those indicating pneumonia.

Why It Is Important:

Pneumonia remains a significant health concern, especially among pediatric patients. Timely and accurate diagnosis is crucial for effective treatment and improved patient outcomes. The automation of pneumonia diagnosis using Deep Learning can faster the process, enabling healthcare professionals to make informed decisions promptly and faster.

How It Will Be Done:

The project will utilize a deep learning approach to train a convolutional neural network (CNN) on a comprehensive dataset of chest X-ray images. The dataset, sourced from Kaggle, includes 5,863 X-ray images categorized into pneumonia and normal cases. The model will be trained to recognize distinct patterns associated with pneumonia, such as lobar consolidations for bacterial pneumonia and diffuse interstitial patterns for viral pneumonia.

Data Utilization:

The dataset consists of chest X-ray images acquired from pediatric patients aged one to five years old. The images are organized into three sets: training, testing, and validation. This diverse dataset will enable the model to learn and generalize patterns indicative of pneumonia across different patient cases.

Evaluation of System Performance:

The system's performance will be evaluated using metrics such as accuracy, precision, recall, and F1 score on the validation set. Additionally, the model will be tested on the separate test set to assess its generalization capability.