**Project proposal**

**Title: Covid-19 Detection**

**PyTorch Capstone Project**

* **Project description:**

The capstone project aims to develop a deep learning model for the detection of COVID-19 from chest X-ray images. With the COVID-19 pandemic continuing to significant global health challenges. This project focuses on leveraging deep learning techniques, specifically using PyTorch, to classify chest X-ray images into two classes: COVID-19 positive and COVID-19 negative.

The dataset comprises near to 400 chest X-ray images, divided into two classes: COVID-19 positive and COVID-19 negative. These images are sourced from publicly available repositories and have been labeled by medical professionals for accurate classification.

The deep learning model architecture will be designed using PyTorch, consisting of convolutional neural network (CNN) layers for feature extraction and classification. Transfer learning techniques may also be explored to leverage pre-trained models for improved performance, considering the limited dataset size.

* **why it is it good?**

This project on COVID-19 detection from chest X-ray images using PyTorch is a compelling topic due to its immediate relevance and potential impact on public health. By leveraging deep learning techniques, it aims to automate the diagnosis process, aiding healthcare professionals in efficiently identifying COVID-19 cases. Additionally, the interdisciplinary collaboration between computer scientists and medical professionals ensures that the developed solution meets practical healthcare needs.

* **Dataset:**

<https://www.kaggle.com/datasets/mohammedali11/xray-image-dataset-for-covid19-detection-a/download?datasetVersionNumber=1>

* **How do you think you will do it?**

To embark on a COVID-19 image classification project, start by acquiring a dataset comprising chest X-ray images categorized as COVID-19 positive and negative. Afterward, preprocess the images to ensure consistent resizing and normalization procedures are applied. Select an appropriate deep learning framework such as PyTorch and craft a tailored convolutional neural network (CNN) architecture geared specifically towards image classification tasks. Subsequently, partition the dataset into training and testing subsets, then proceed to train the model utilizing the training data.

* **Evaluation Method:**

Evaluate the model's efficacy utilizing key metrics such as accuracy, precision, confusion matrix, recall, and F1-score on the testing subset. Should the need arise, iteratively refine the model architecture and hyperparameters to bolster its performance. Ultimately, deploy the trained model for real-world applications, maintaining continuous validation and monitoring practices to uphold its accuracy and reliability over time.