Automated COVID-19 Detection Using Machine Learning

Motivation: The COVID-19 pandemic has underscored the need for effective and innovative diagnostic tools. A web-based application that analyzes cough audio to predict COVID-19 infection can offer a convenient and non-invasive screening method, potentially aiding early detection and reducing healthcare burdens.

Goals:

1. Develop a web app that records cough audio and predicts COVID-19 infection.
2. Build and train a Convolutional Neural Network (CNN) from scratch using the provided dataset for audio classification.
3. Integrate the CNN model into the web app for real-time predictions.
4. Display the progression of a patient's condition over different days based on their cough audio predictions.

Objectives:

1. **Create a Web App:** Design a basic interface for audio recording, displaying predictions, and tracking progression over time.
2. **Develop CNN Model:** Design and train a CNN model to classify cough audio.
3. **Integrate and Test:**
    - Merge the CNN model with the web app.
    - Implement a feature to display the progression of the patient's condition.
    - Ensure the app's functionality through testing.
4. **Final Output:** By the end of the project, the web app will be capable of predicting COVID-19 infection from cough audio and will also feature functionality to track and display how a patient's condition evolves over time, thus providing users with a view of their health status changes across various days.

Dataset: https://www.kaggle.com/datasets/andrewmvd/covid19-cough-audio-classification

Learning Objectives:

- Gain experience in developing web applications and integrating machine learning models.
- Learn how to build and train a CNN for audio classification.
- Develop skills in tracking and visualizing data over time.
- Enhance abilities in testing, documenting, and presenting a project effectively.