Final Project Proposal

The project will be a mobile application, developed using Flutter to help users identify diseases in commonly grown crops like tomatoes, potatoes, and peppers. Users will be able to upload a photo of a plant leaf to receive an instant diagnosis of any detected disease. The app will save a history of past diagnoses, allowing users to keep track of plant health over time. For each diagnosis, the app will also provide links to additional information on the disease, including suggested treatments and prevention tips.

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Working Title of the Application: **Dr. Plantastic** - Disease Detection and Treatment Guide for Common Crops

Type of Application: Mobile application

Dataset:

- **Type of Data**: Images of plant leaves, specifically covering common crops like tomatoes, potatoes, and peppers, with various disease labels (e.g., blight, bacterial spot).

- **Modification**: The data will be used to fine-tune a pre-trained model, customizing it to recognize diseases specific to the available crops.

- **Source**: The primary dataset will be **PlantVillage**, which offers labeled images of diseased and healthy plant leaves, easily available on open-source platforms like Kaggle. Additionally, user-provided images can be collected over time, allowing us to expand the model's capabilities as more data becomes available.

Prediction:

- The app will predict the disease type affecting the leaves of specific crops (tomato, potato, pepper). It will offer a probability score and provide the disease name, symptoms, and suggested care.

Justification for the Application's Functionality:

- This app will be particularly useful for farmers, gardeners, and agricultural workers who regularly grow common crops like tomatoes, potatoes, and peppers. Early detection of plant diseases can help prevent significant crop damage by enabling timely intervention. By uploading an image of a diseased leaf, users can quickly receive a diagnosis, which is especially valuable in remote areas where access to agricultural experts may be limited.

  Since the app will focus on widely cultivated crops, it has the potential to reach a broad user base. For each disease detected, the app will link to information on treatments and organic care practices, promoting sustainable farming practices. Future updates could expand coverage to more plant species, either through additional data collection or by allowing users to contribute labeled images.

Applied Machine Learning Model:

- **Model Type**: Convolutional Neural Network (CNN) using transfer learning with pre-trained models.

- **Training**: We will utilize a pre-trained model, such as MobileNet or ResNet, which are freely available and open-source. These models will be fine-tuned on the PlantVillage dataset specifically for the purpose of detecting diseases in the selected crops. Transfer learning allows us to use the existing capabilities of these models while training them to focus on plant disease classification. As users contribute their own labeled images over time, we will incorporate these images into the training dataset for periodic model updates.

The End

They say, some people wander the world in search of inspiration, while I found mine sitting quietly in the corners of my living room.