SEMESTER PROJECT

GROUP MEMBERS:

DAUD AHMAD (FA-2020/BSSE/192)

TALHA NAWAZ (FA-2020/BSSE/213)

SUBJECT:

DEEP LEARNING

SECTION:

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SUBMITTED TO:

GULSHAN SALEEM

Potato Leaf Disease Detector

1. Introduction

Potato leaf diseases pose significant challenges to agricultural productivity. Early and accurate detection of these diseases can help farmers take timely actions to mitigate crop loss. This project utilizes a convolutional neural network (CNN) to detect and classify diseases in potato leaves from images.

2. Objective

The primary objective of this project is to develop a deep learning-based model that can accurately classify images of potato leaves into multiple disease categories, as well as identify healthy leaves.

3. Dataset

The dataset used for this project consists of labeled images of potato leaves. The images are categorized into three classes:

- Healthy leaves
- Leaves affected by Early Blight
- Leaves affected by Late Blight

4. Methodology

A convolutional neural network (CNN) model is constructed with the following layers:

- **Convolutional Layers**: Multiple Conv2D layers with ReLU activation to extract features.
- **Pooling Layers**: MaxPooling2D layers to reduce spatial dimensions.
- **Dense Layers**: Fully connected layers to classify features.
- **Output Layer**: Softmax activation to produce probability distributions over classes.

5. Results

The model's performance is evaluated on a validation dataset. Metrics such as accuracy and loss are used to assess the model's effectiveness in classifying potato leaf diseases.

6. Conclusion

The CNN-based potato leaf disease detector demonstrates the potential of deep learning in agricultural applications. Future work could involve improving the model's accuracy by using more advanced architectures and a larger dataset, as well as deploying the model in a mobile application for real-time disease detection.