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THE KNOWLEDGE UNIVERSITY

Faculty of Computing

Plant Disease Detection System

Group ID: 2025-Y2-S1-MLB-B8G1-07

Team Members

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Introduction

This project focuses on developing a **deep learning-based system** that can automatically detect plant diseases from leaf images. The goal is to assist farmers and agricultural researchers in identifying plant diseases early, thereby minimizing crop loss and improving yield.
Our system uses Deep trained on a labeled dataset of healthy and diseased plant leaves.

Project Objectives

- To develop an image classification model capable of detecting different plant diseases.
- To build a user-friendly interface for image input and prediction

Dataset Description

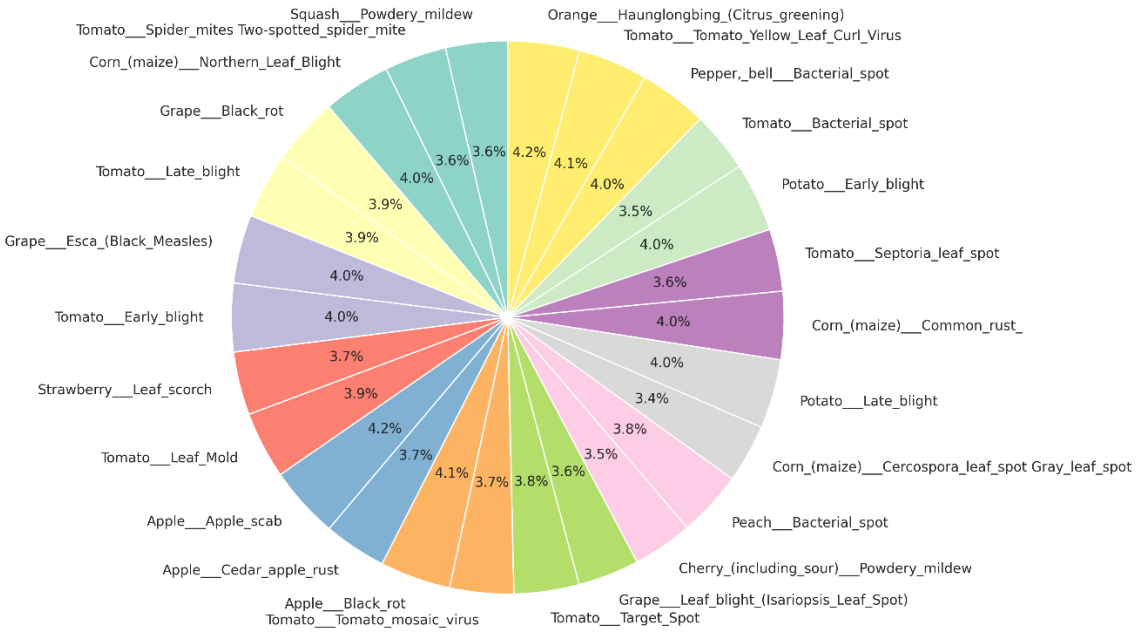
- Dataset Source: New Plant Diseases Dataset
- Number of Images: 87000+ images (60000 used by our model)
- Classes: 32 classes (26 used by our model)
- Data Split:
    - Training data: 48000
    - Validation data: 12000

Image Preprocessing

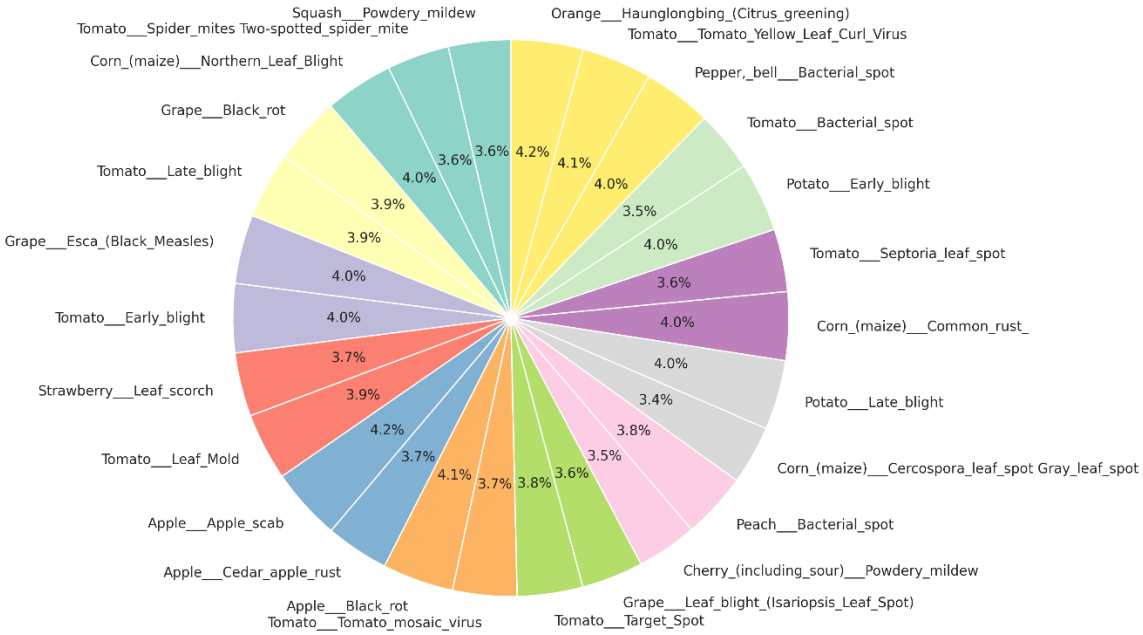
- Resized all images to 224×224 pixels.
- Normalized pixel values to range [0,1].
- Applied data augmentation (rotation, flipping, zoom) to improve generalization.

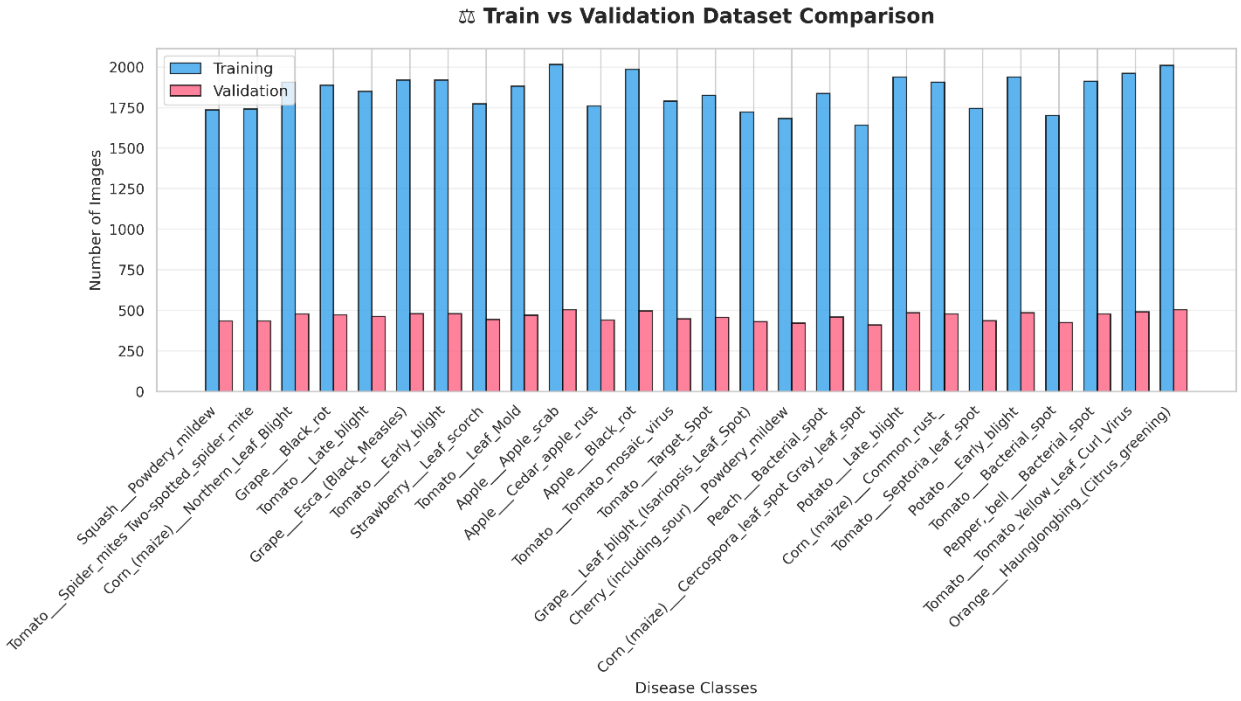
Dataset Analysis

Training Set: Disease Distribution

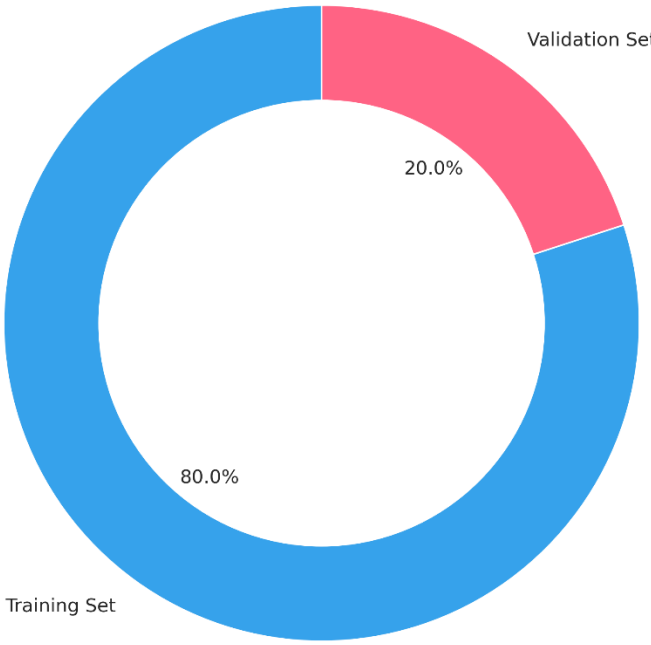


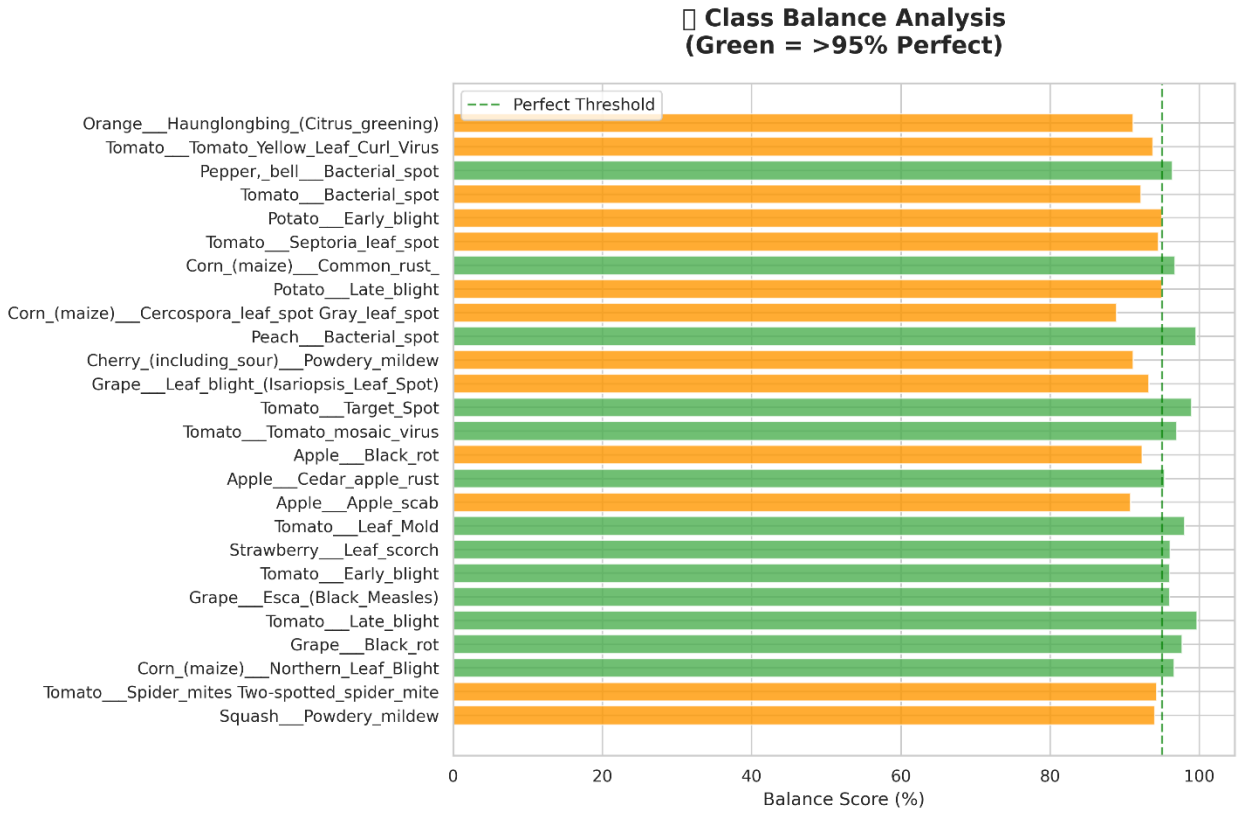
Validation Set: Disease Distribution



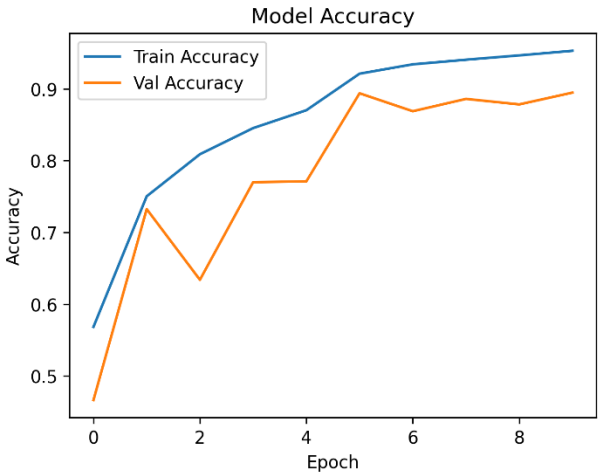


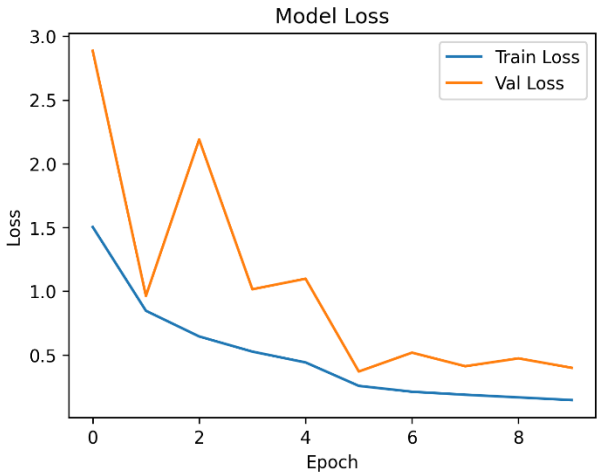
Overall Dataset Split

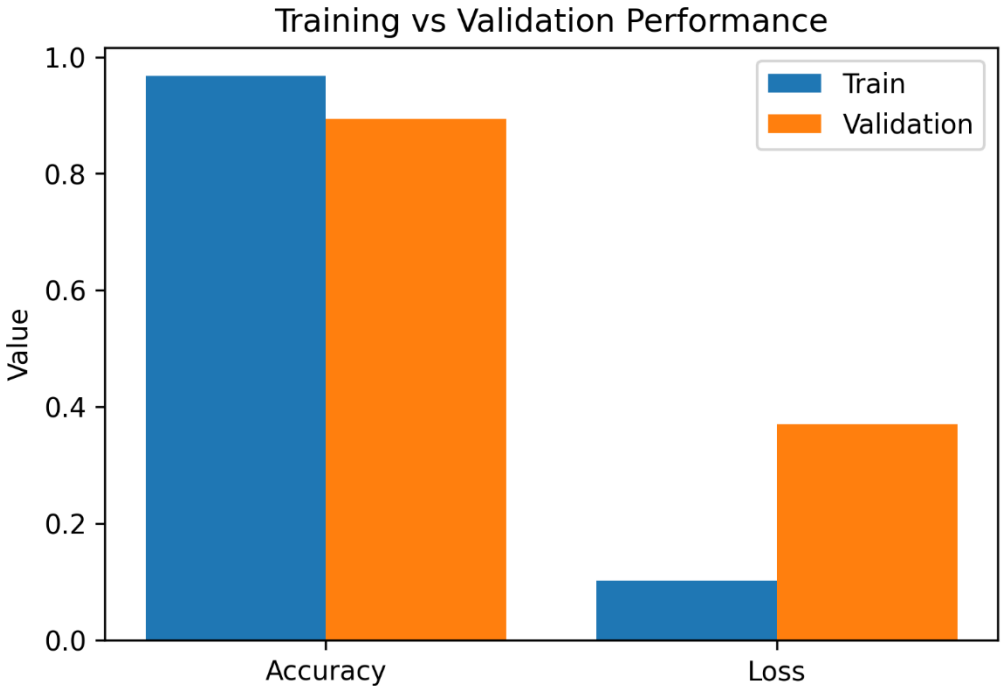


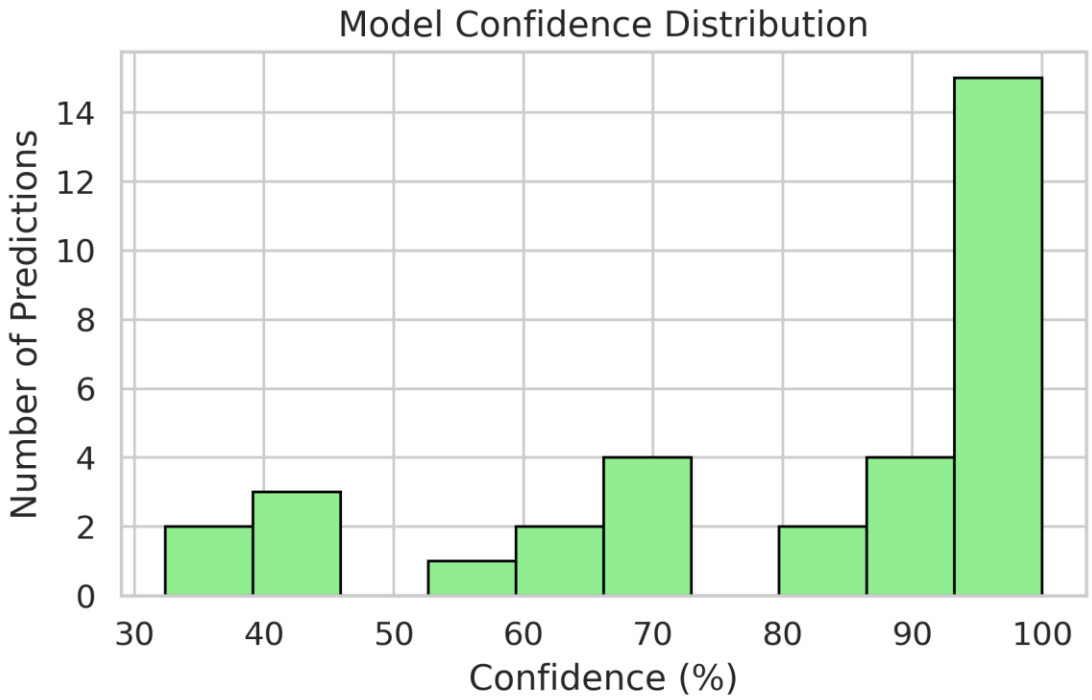

Class Balance Analysis
(Green = >95% Perfect)
Perfect Threshold
Orange___Haunglongbing_(Citrus_greening)
Tomato___Tomato_Yellow_Leaf_Curl_Virus
Pepper,_bell___Bacterial_spot
Tomato___Bacterial_spot
Potato___Early_blight
Tomato___Septoria_leaf_spot
Corn_(maize)___Common_rust_
Potato___Late_blight
Corn_(maize)___Cercospora_leaf_spot Gray_leaf_spot
Peach___Bacterial_spot
Cherry_(including_sour)___Powdery_mildew
Grape___Leaf_blight_(Isariopsis_Leaf_Spot)
Tomato___Target_Spot
Tomato___Tomato_mosaic_virus
Apple___Black_rot
Apple___Cedar_apple_rust
Apple___Apple_scab
Tomato___Leaf_Mold
Strawberry___Leaf_scorch
Tomato___Early_blight
Grape___Esca_(Black_Measles)
Tomato___Late_blight
Grape___Black_rot
Corn_(maize)___Northern_Leaf_Blight
Tomato___Spider_mites Two-spotted_spider_mite
Squash___Powdery_mildew
0
20
40
60
80
100
Balance Score (%)

performance analysis








Model Confidence Distribution
Number of Predictions
0
2
4
6
8
10
12
14
30
40
50
60
70
80
90
100
Confidence (%)