Tomato Leaf Disease Detection - Project Documentation

# 1. Introduction

This project is a web-based Tomato Leaf Disease Detection System developed using a Convolutional Neural Network (CNN) model integrated into a Flask web application. The user uploads an image of a tomato leaf, and the system predicts the disease present in the leaf.

# 2. Project Structure

The following is the folder structure of the project:

Tomato-Leaf-Project/  
│  
├── app.py # Main Flask backend  
├── requirements.txt # Required Python libraries  
├── README.md # Project documentation  
│  
├── Training/ # Contains the trained CNN model  
│ └── tomato\_leaf\_disease\_model.h5  
│  
├── static/ # Static files  
│ ├── uploads/ # Uploaded images  
│ └── style.css # CSS styling  
│  
├── templates/ # HTML templates  
│ ├── index.html # Home page (upload form)  
│ └── result.html # Result page (shows prediction)

# 3. Description of Project Files

## app.py

Main application file for Flask. Loads the CNN model, processes uploaded images, predicts disease, and renders HTML templates.

## Training/tomato\_leaf\_disease\_model.h5

Pre-trained CNN model saved using Keras. Used for inference (prediction) in the Flask app.

## templates/index.html

Homepage that provides an upload form for users to submit tomato leaf images.

## templates/result.html

Displays the prediction result along with the uploaded image.

## static/uploads/

Stores uploaded images temporarily to be displayed back to the user.

## static/style.css

Contains CSS styles for HTML pages. Optional but improves UI presentation.

## requirements.txt

Lists all Python libraries required to run the project. Can be installed using pip.

## README.md

Contains project overview, setup instructions, model classes, and usage details.

# 4. Supported Disease Classes

The model is trained to detect the following tomato leaf conditions:

* Tomato\_\_\_Bacterial\_spot
* Tomato\_\_\_Early\_blight
* Tomato\_\_\_Late\_blight
* Tomato\_\_\_Leaf\_Mold
* Tomato\_\_\_Septoria\_leaf\_spot
* Tomato\_\_\_Spider\_mites
* Tomato\_\_\_Target\_Spot
* Tomato\_\_\_Tomato\_YellowLeaf\_Curl\_Virus
* Tomato\_\_\_Tomato\_mosaic\_virus
* Tomato\_\_\_healthy

# 5. How to Run the Project

1. Clone the project folder.

2. Create and activate a virtual environment (optional but recommended).

3. Install dependencies using: pip install -r requirements.txt

4. Run the Flask application using: python app.py

5. Open a browser and navigate to: http://localhost:7000