Project Initialization and Planning Phase

Date	10 November 2024
Team ID	team-739757
Project Title	Tomato Plant Disease Detection From Leaf Images Using Deep Learning
Maximum Marks	3 Marks

Project Proposal (Proposed Solution) template

This project proposal outlines a solution to the problem of identifying diseases in tomato plants using images of leaves and deep learning technology. By leveraging AI-based image recognition, this solution aims to help farmers detect diseases early, reduce crop loss, and improve farm productivity.

Project Overview	
Objective	To develop a deep learning model that can accurately detect and classify diseases in tomato plants from leaf images, allowing for early diagnosis and intervention.
Scope	The project will focus on building and deploying a mobile-compatible application for tomato farmers. It will support image uploads, disease prediction. This tool will be trained on a dataset of tomato leaf images with labeled diseases.
Problem Statement	
Description	Tomato plants are vulnerable to various diseases that often go undetected until they cause significant damage. Early detection is challenging due to the subtle nature of early symptoms, and traditional methods are labor- intensive and require expert knowledge. This project addresses the need for an accessible, automated solution for disease detection.
Impact	By automating disease detection, this solution will enable tomato farmers to identify issues early, reduce crop loss, and save on costs associated with manual inspection or incorrect treatments.
Proposed Solution	

Approach	**Approach:** The solution involves developing a ResNet152V2, a deep convolutional neural network, is used in this project for its high accuracy and ability to capture complex image features.making it ideal for distinguishing tomato plant diseases from leaf images. The model will be integrated into a user-friendly mobile application that allows farmers to upload images and receive real-time disease diagnoses.
Key Features	Image upload and preprocessing for optimal prediction accuracy Real-time disease classification with confidence scores Disease management suggestions based on predicted disease type Mobile compatibility for ease of access in the field

Resource Requirements

Resource Type	Description	Specification/Allocation
Hardware		
Computing Resources	CPU/GPU specifications, number of cores	NVIDIA GPU, 16 GB VRAM
Memory	RAM specifications	8 GB
Storage	Disk space for data, models, and logs	1 TB SSD
Software		
Frameworks	Python frameworks	Flask
Libraries	Additional libraries	TensorFlow, PyTorch or Keras , scikit-learn, Matplotlib
Development Environment	IDE, version control	Jupyter Notebook, Git, Google Colab
Data		
Data	Source, size, format	Kaggle dataset, 11,000 images