

Project Interim Report

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➤ **Objectives of the Study:**

- To develop a machine learning-based system for detecting plant diseases.
- To enhance agricultural productivity by providing early disease diagnosis.
- To assist farmers in taking preventive measures to reduce crop loss.
- To classify different types of plant diseases based on leaf images.

➤ **Scope of the Study:**

- The system will analyze images of plant leaves to detect diseases.
- It will use machine learning algorithms for accurate classification.
- The study focuses on common plant diseases affecting major crops.
- The project aims to create a user-friendly interface for farmers.

➤ **Methodology:**

- **Data Collection:** Gathering a data set of plant leaf images with disease labels.
- **Preprocessing:** Image enhancement and noise reduction.
- **Model Training:** Using ML algorithms like CNN (Convolutional Neural Networks).
- **Testing & Evaluation:** Checking model accuracy using test datasets.
- **Deployment:** Creating a web or mobile application for farmers to upload leaf images.

➤ **Research Design:**

- **Experimental Research Design:** The project involves training and testing machine learning models.
- **Comparative Study:** Performance evaluation of different ML algorithms.

➤ **Data Collection Method:**

- Image datasets are collected from public repositories (e.g., PlantVillage).
- Images are manually labeled and categorized based on disease types.

➤ **Sampling Method:**

- **Random Sampling:** Selecting a diverse set of plant images from different species.
- **Stratified Sampling:** Ensuring a balanced dataset of healthy and diseased plants.

➤ **Data Analysis Tools:**

- **Python Libraries:** OpenCV, TensorFlow, Keras, NumPy, Pandas, Matplotlib.
- **Machine Learning Models:** CNN, Transfer Learning (e.g., VGG16, ResNet).
- **Evaluation Metrics:** Accuracy, Precision, Recall, F1-score.