Project Report

Identification of Plant Disease Based on Deep Learning Methods

INTRODUCTION :

- Plants are a crucial part of agriculture. The health of plants has a direct impact on crop yields. During the growth stages, leaf often diseases originate from end. It is difficult for farmers to discern their real nature.

- In order to solve this problem, we created a Plant Disease Recognition System using Deep Learning (CNN). It can determine by simply scanning a image of whether a leaf is healthy or sick.

Project objectives

- Developing a model which can automatically identify plant diseases from leaf images.

- Helping farmers get timely and accurate disease diagnosis.

- Reducing crop losses and supporting smart farming technologies.

Problem definition

Farmers cannot often identify just how sick their plants are by observing their leaves or flowers This leads to:

- Late detection of the disease
- Spread of infection
- Quality or quantity loss in crops
- On the basis of plant leaf images, automatic computer diagnosis systems can be used to detect diseases early.

This project utilized the PlantVillage dataset, which has hundreds of thousands of leaf images, covering both:

- Healthy leaves,
- and leaves with each of the diseases, where each image has the disease's name attached to it.

**5. Method:

Step 1: Gather the Data We gathered all of the PlantVillage dataset's leaf photos.

Step 2: Prepare the Data Make sure every image is consistent by resizing the data. Each image in this project is 224 x 224 pixels in size.

In order for the model to accept the data as a legitimate input, normalize the pixel values and transform the data into a numerical array format.

*Step 3: Constructing the CNN model

Here, the Vanilla CNN (Convolutional Neural Network) model is employed. This model picks up on a number of traits and patterns in the pictures, such as:

Spots, color shifts, leaf form distortion,

Instruction

This allows the model to learn from thousands of data photos, which will only improve the model's accuracy.

Step 5: Prediction and Testing

Ultimately, the model is presented with a fresh leaf image and makes an effort to forecast the disease linked to it.The

***6. System Architecture* Image → Preprocessing → CNN Model → Forecast → Illness Name**

***7. Technologies and Tools Employed**

Python is the programming language.

Tensorflow and Keras

OpenCV; NumPy and Pandas; Matplotlib; Jupyter Notebook

***8. Result**

The model can identify a number of plant illnesses.

The quantity of the dataset and the caliber of the training determine the model's accuracy.

Excellent for common ailments like:

- **Leaf Spot**
- **Blight**
- **Rust**

9. Advantages of the System

Easy to use; compatible with mobile and web applications; helps farmers make decisions; reduces crop loss; and enables prompt diagnosis of illnesses

10. Limitations requires a good

11. Future Scope

- **Build a mobile app for farmers**
- **Add new plant species**
- **Improve accuracy with advanced dee p learning models**
- **Create a real-time camera detection system**