Parshvanath Charitable Trust's
A. P. SHAH INSTITUTE OF TECHNOLOGY
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(Religious Jain Minority)

Plant Disease Prediction using Deep Learning

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Project Guide
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Outline

- Introduction
- Literature Survey of the Existing Systems
- Limitations of the Existing Systems
- Problem Statement
- System Design
- Technologies and Methodologies
- Implementation Screenshots(Partial)
- Conclusion
- References

Introduction

- **What is Plant Disease Classification?**

1. Identifying diseases in plants through automated methods.
2. Helps in early detection and prevention of crop losses.

- **Why is it Important?**

1. Saves time and reduces dependency on human expertise.
2. Increases agricultural productivity and sustainability.

• Literature Survey of the Existing System

Plant Disease Detection Using Deep Learning
Publisher: IEEE
Ebrahim Hirani; Varun Magotra; Jainam Jain; Pramod Bide
Abstract:

Convolutional Neural Networks (CNNs) have been widely used for plant disease detection, a crucial task in agriculture. While deep learning methods have improved disease identification, they have limitations. Recently, transformer networks have shown great promise in computer vision. This paper compares traditional CNNs with transformers for plant disease detection, achieving a best validation accuracy of 97.98%.[1].

Published in: 2021 6th International Conference for Convergence in Technology (I2CT)

Plant disease classification using deep learning
Publisher: IEEE
Akshai KP; J. Anitha
Abstract:

Agriculture is vital to India's economy, making early plant disease detection essential to prevent crop loss. Traditionally, farmers manually identify diseases, but deep learning offers a faster, more accurate alternative. This project trains a CNN model for plant disease classification, utilizing pre-trained models like VGG, ResNet, and DenseNet. Among them, DenseNet achieves the highest accuracy.[2]

Published in: 2021 3rd International Conference on Signal Processing and Communication (ICPSC)

Problem statement

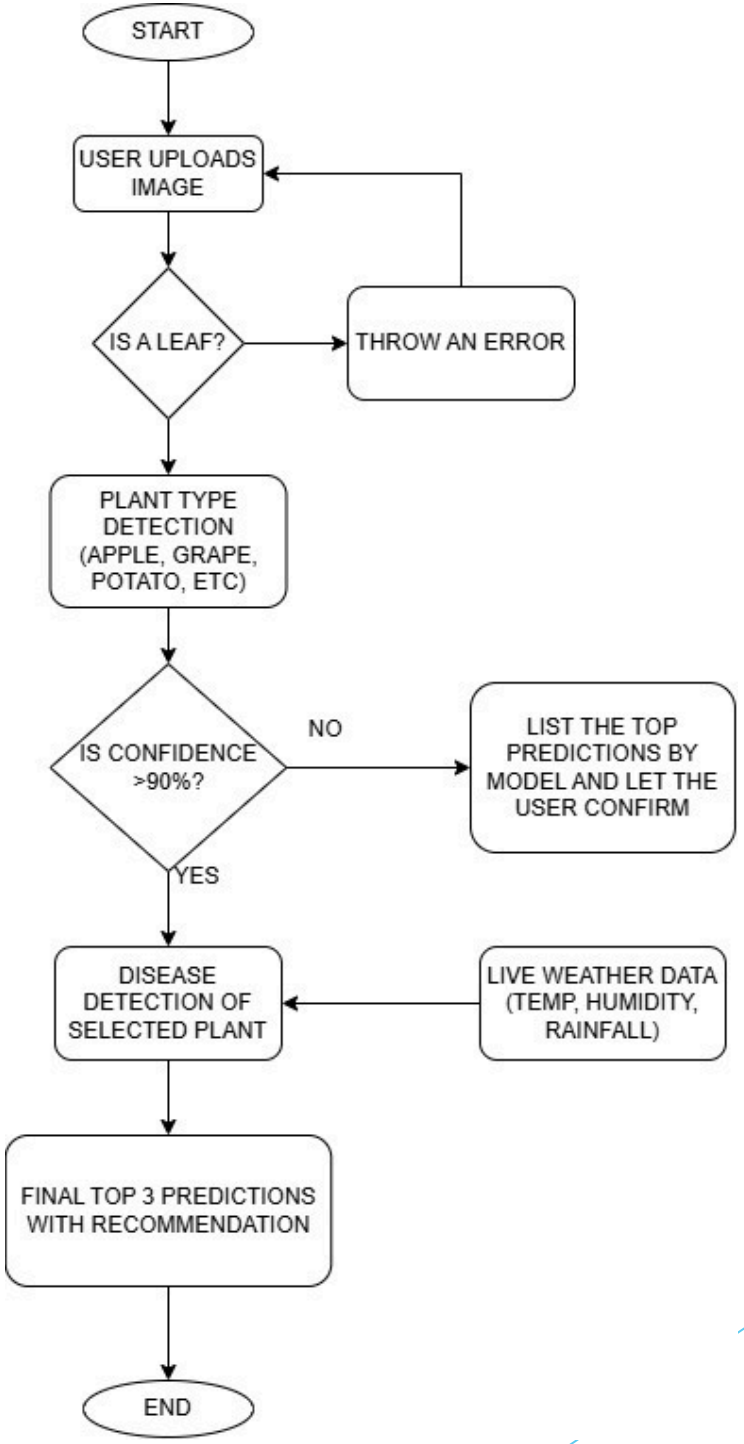
- **The Problem:**

1. Plant diseases cause significant crop losses worldwide.
2. Manual inspection is slow, costly, and inaccessible to many farmers.

- **The Challenge:**

1. Accurately classify plant diseases using image-based methods.
2. Ensure the solution is scalable, affordable, and user-friendly.

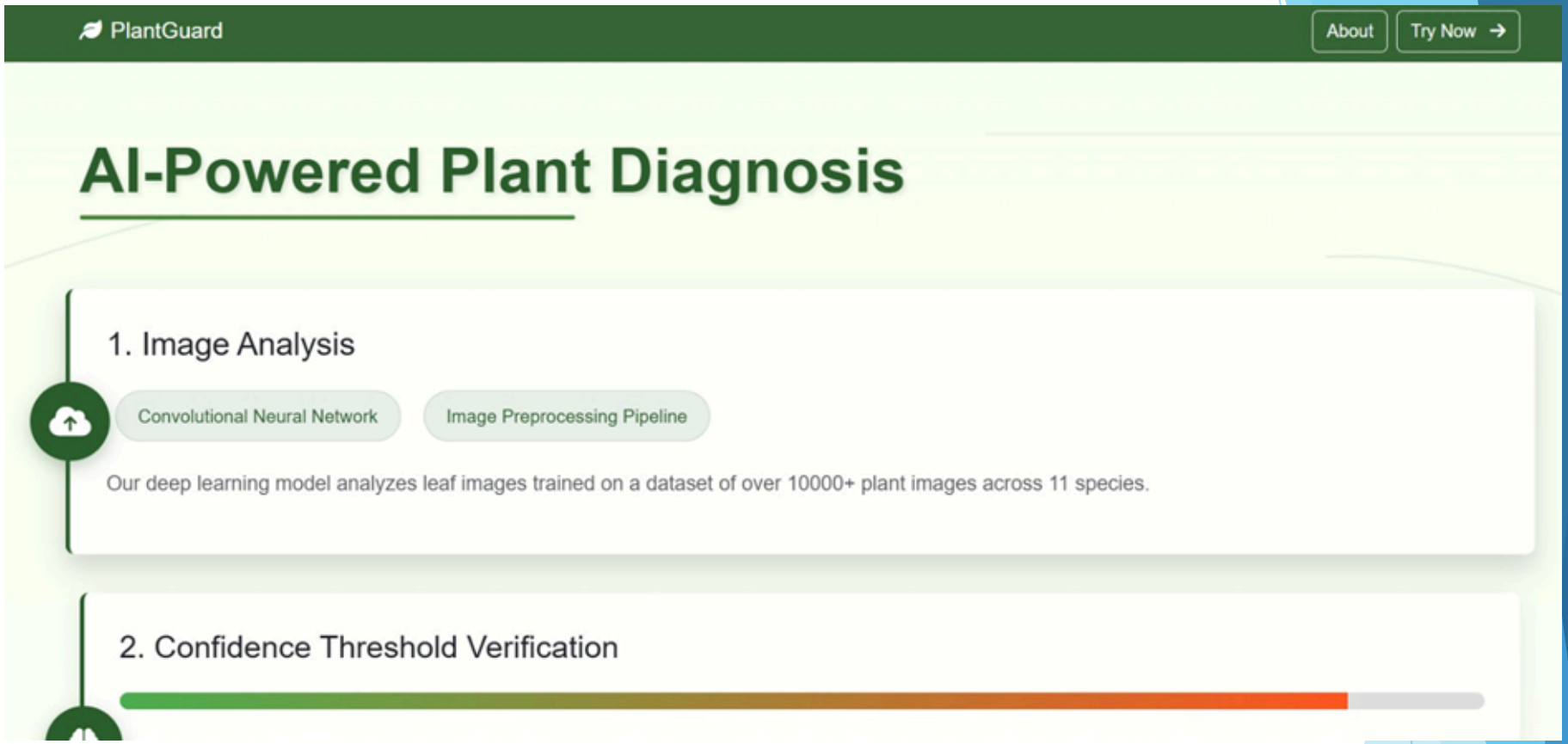
Overview of System Design



Technology Stack

1. **Programming Language:**
- Python
2. **Data Handling:**
- Pandas, NumPy, Image data Generator
3. **Model Development:**
- TensorFlow / Keras (for CNN and transfer learning with models like ResNet)
4. **Model Evaluation:**
- scikit-learn (for accuracy, precision, recall, F1-score, confusion matrix)
5. **Backend:**
- Flask (For Deploying the model)

Implementation(Screenshots of implementation at least 50%)



Disease Analysis Report

Detected Location

unnamed road, Kasarvadavli, Thane, Maharashtra, 400615, India

Back to Home

Apple Apple scab

Apple scab is a common fungal disease affecting apple trees. It causes dark, scabby lesions on leaves and fruit.

Apple Black rot

Black rot is a serious fungal disease of apple trees, leading to fruit decay and leaf damage.

Apple healthy

The apple appears healthy with no visible disease symptoms.

How PlantGuard Works

1. Image Upload

The user uploads an image of a plant leaf. The system first detects if the image contains a leaf before proceeding.

2. Plant Type Detection

The model predicts the plant type. If confidence is high (≥90%), it proceeds. Otherwise, the user selects from top predictions.

3. Weather Data Fetching

Live location is used to fetch weather data (temperature, humidity, rainfall) via the OpenWeatherMap API.

Conclusion

- **Early Detection:** AI-powered plant disease classifiers enable timely disease identification, reducing crop losses.
- **Boosts Productivity:** Enhances agricultural yield and sustainability through effective disease management.
- **Accessible & Scalable:** User-friendly tools for farmers, scalable for all farming levels.
- **Future-Ready:** Continuous advancements in AI promise even greater accuracy and impact.
- **Take Action:** Adopt technology to safeguard crops and ensure global food security.

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Thank You...!!