CropCure Pro – Final Project Report

INTRODUCTION

CropCure Pro is an AI-powered tool designed to help farmers and researchers identify plant leaf diseases just by uploading an image. With plant diseases becoming a major challenge in agriculture, especially for small-scale farmers, early diagnosis is essential. This project aims to simplify disease detection through deep learning and computer vision, making technology more accessible to those who need it most.

ABSTRACT

The project focuses on building an intelligent web-based application that can detect diseases in plant leaves using a convolutional neural network (CNN). Users simply upload an image of a plant leaf, and the app predicts the disease along with its confidence score, displays useful information, and even suggests a cure tip. The model was trained on a publicly available dataset of labeled plant images and integrated into a Streamlit-based frontend for ease of use. Additionally, a multi-language toggle, prediction explanation, and visual enhancements were included to improve user experience.

TOOLS USED

- Programming Language: Python
- Libraries & Frameworks: TensorFlow, Keras, Streamlit, NumPy, Matplotlib
- UI Enhancements: HTML, CSS, Emojis for visual feedback
- Model Training: Google Colab
- Dataset: PlantVillage Dataset
- IDE: VS Code

STEPS INVOLVED IN BUILDING THE PROJECT

1. Understanding the Problem Statement – I began by researching common plant diseases and why they are a major concern for farmers. I explored existing AI solutions and their limitations.
2. Data Collection & Preprocessing – I used the PlantVillage dataset, cleaned the data, resized the images, and normalized the pixel values for training.
3. Model Building – A CNN was built using TensorFlow and Keras. I experimented with multiple architectures and hyperparameters to improve accuracy while preventing overfitting.
4. UI/UX Design with Streamlit – I developed a clean, mobile-friendly web app using Streamlit. I added features like a file uploader, prediction results with confidence, disease info, cure tips, and even a wow combo: top-3 predictions, emoji cues, and a stylish diagnosis card.
5. Multilingual Feature – To make the app inclusive, I added support for translating disease names into Tamil and Hindi.
6. Testing & Deployment – I tested the model with various images and tweaked the app for performance and UI polish.

CONCLUSION

Through this project, I gained hands-on experience in building a complete AI solution — from data preprocessing to UI deployment. It allowed me to explore both technical and design aspects of machine learning applications. I also learned the importance of user-friendly design when working on real-world problems. Overall, CropCure Pro has been a meaningful and rewarding project, and I'm proud of how far it has come.