AI Assistant for Plant Disease Diagnosis

(Project Proposal)

Project Code

FYP2226G

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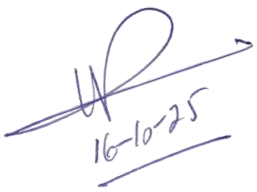

Project Manager's Signature

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Abstract

This project proposes the development of an AI powered Farmer Assistant application designed to support farmers in making smarter and more informed decisions. Farmers often face challenges such as unpredictable weather conditions, crop diseases, and limited access to timely expert guidance. The proposed system addresses these issues by providing personalized recommendations based on crop type, geographical location, and real time weather data. Key features of the application include plant disease detection using image analysis, real-time weather updates, and an AI based chatbot that allows farmers to communicate through text. This project is valuable for both academic research and real-world applications, as it contributes to the advancement of artificial intelligence in agriculture while promoting sustainable farming practices. By reducing crop losses and improving productivity, the system aims to make farming more efficient, intelligent, and accessible.

Background and Justification

Agriculture is essential for food security and the economy, but many farmers still face problems like unpredictable weather, crop diseases, and limited access to expert advice. Most rely on traditional methods, which often lead to low productivity and financial losses. Although AI-based tools for farming, such as plant disease detection and weather prediction, already exist, they are usually limited to specific functions and are not always easy for farmers to use [1], [3].

This project aims to improve and expand on those existing solutions by developing a **user-friendly interface of an AI-powered Farmer Assistant App**. The app will combine features like plant disease detection, real-time weather updates, and an AI chatbot that provides simple, personalized farming advice [1], [2].

The goal is to make advanced agricultural technology accessible to all farmers, especially those with little technical knowledge. By offering accurate, real-time insights in one platform, this system will help farmers make better decisions, boost productivity, and adapt more effectively to changing environmental conditions [3], [4].

Project Methodology

The first step is **data collection**, which plays a vital role in building accurate and reliable AI models. The project will begin by gathering a wide range of agricultural data from trusted public and government sources. This includes information about soil types, crop varieties, and climate conditions, as well as recommended agricultural practices. Such data will help the system understand the unique needs of different crops and environments.

For the **disease detection** feature, a large dataset of plant disease images will be collected. These images will be sourced from agricultural research institutions and open-access datasets to ensure diversity and accuracy. The data will then be used to train image recognition models capable of identifying diseases from pictures of leaves or plants uploaded by farmers.

In addition, **weather data** will be integrated through APIs that provide real-time updates based on the farmer's specific location. This will help the system deliver accurate weather forecasts, such as rainfall predictions, temperature changes, and humidity levels. Farmers will be able to use this information to plan their activities, such as irrigation or harvesting, more effectively.

Once all data sources are integrated, the AI models will be trained and tested to ensure they provide accurate predictions and useful recommendations. The application will then combine all these features into a user-friendly interface, allowing farmers to easily access information, receive advice, and interact with the AI chatbot through text .

Project Scope

Included Features:

- Farmers can easily upload pictures of their plants to detect any diseases using AI technology.
- The system quickly analyzes the image and identifies possible issues affecting the crop.
- Once a disease is detected, it recommends suitable products and treatments to fix the problem.
- The app also provides real-time weather updates to help farmers plan watering, harvesting, and spraying schedules.
- Farmers can track weather conditions like rainfall, temperature, and humidity directly in the app.
- A smart chatbot is available for farmers to ask questions or get instant farming advice.
- The system aims to make farming smarter, faster, and more efficient.
- Overall, it helps farmers protect their crops, save time, and increase productivity.

Not Included:

- The system won't include advanced tools like drones for field monitoring.
- Automated systems for irrigation, pest control, or fertilizer spraying are not part of this phase.
- These features may be added in future updates as the project grows.

High level Project Plan

Task Name	Duration	Start	Finish	Description
Proposal Writing & Submission	7 days	01-Oct-2025	07-Oct-2025	Prepare and finalize the project proposal for approval.

Data Collection(Part 1)	7 days	08-Oct-2025	14-Oct-2025	Gather initial dataset from primary and secondary sources.
Data Collection (Part 2 & Preparation)	7 days	15-Oct-2025	21-Oct-2025	Continue data collection, clean and preprocess data for analysis.
Prepare SRC Document	14 days	22-Oct-2025	04-Nov-2025	Prepare the Student Research Committee (SRC) documentation.
SRC Submission (Milestone)	2 days	05-Nov-2025	06-Nov-2025	Submit SRC documentation for review and approval.
Requirement Gathering	14 days	07-Nov-2025	20-Nov-2025	Identify functional and non-functional requirements from stakeholders.
System Architecture Design	14 days	21-Nov-2025	04-Dec-2025	Design the overall system structure including modules and workflows.
Frontend Navigation	7 days	05-Dec-2025	11-Dec-2025	Develop and implement navigation components for the frontend interface.
Frontend Design	7 days	12-Dec-2025	18-Dec-2025	Create and integrate user interface layouts and visual design elements.
Design Document Finalization	6 days	19-Dec-2025	24-Dec-2025	Finalize and review design documentation before development.
Model Training	15 days	25-Dec-2025	08-Jan-2026	Train the initial version of the predictive or analytical model.

References

[1] P. S. Venkata Reddy, K. S. Nandini Prasad, and C. Puttamadappa, “Farmer’s Friend: Conversational AI Bot for Smart Agriculture,” *Journal of Positive School Psychology*, vol. 6, no. 2, pp. 2541–2549, 2022. Available: https://journalppw.com/index.php/jpsp/article/view/1833

[2] V. Nayak, N. H. Sowmya, *et al*., “AgroXpert: Farmer Assistant,” *Global Transitions Proceedings*, vol. 2, no. 2, pp. 506–512, 2021. Available: https://www.scribd.com/document/716551511/Agroxpert-Farmer-assistant-2021-Global-Transitions-Proceedings

[3] A. Jafar, N. Bibi, R. A. Naqvi, A. Sadeghi-Niaraki, and D. Jeong, “Revolutionising Agriculture with Artificial Intelligence: Plant Disease Detection Methods, Applications, and Their Limitations,” *Frontiers in Plant Science*, vol. 15, Article 1356260, 2024. Available: https://www.frontiersin.org/journals/plant-science/articles/10.3389/fpls.2024.1356260/full

[4] T. Yadav, P. Sable, and D. Kalbande, “Smart Kisan: A Mobile App for Farmers’ Assistance in Agricultural Activities,” in *Proceedings of the 2023 International Conference on Smart Systems for Applications in Electrical Sciences (ICSSES)*, 2023, pp. 1–6.