ELEVATING FARMER WELFARE THROUGH USER FRIENDLY INTERACTION AND PERSONALISED AGRICULTURE SOLUTIONS

A Main project thesis submitted in partial fulfillment of requirements for the award of degree for VIII semester

BACHELOR OF TECHNOLOGY

IN

COMPUTER SCIENCE AND ENGINEERING

by

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Approved by AICTE & Andhra University, Visakhapatnam 2022-23

(Affiliated to JNTUK, Kakinada upto 2021-22)

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CERTIFICATE

This is to certify that the main project entitled "**Elevating Farmer Welfare through User Friendly Interaction and Personalised Agriculture Solutions**" being submitted by

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in partial fulfillment for the award of the degree "Bachelor of Technology" in Computer Science and Engineering to the Jawaharlal Nehru Technological University, Kakinada is a record of bonafide work done under my guidance and supervision during VIII semester of the academic year 2023-2024.

The results embodied in this record have not been submitted to any other university or institution for the award of any Degree or Diploma.

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DECLARATION

We hereby declare that this project entitled **"ELEVATING FARMER WELFARE THROUGH USER FRIENDLY INTERACTION AND PERSONALISED SOLUTIONS**" is a bonafide work done by us and submitted to **Department of Computer Science and Engineering**, **G. V. P College of Engineering (Autonomous) Visakhapatnam**, in partial fulfillment for the award of the degree of B. Tech is of our own and it is not submitted to any other university or has been published anytime before.

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ABSTRACT

Our innovative web application leverages cutting-edge technologies like FastAPI alongside a finely-tuned VGG16 Convolutional Neural Network (CNN) to identify and provide detailed insights into crop diseases affecting commonly cultivated crops such as paddy, tomato, potato, maize, and more. With a user-friendly interface, farmers can seamlessly interact with a chatbot to access personalized information on disease causes, symptoms, and recommended agricultural interventions. The platform's comprehensive solution empowers farmers with the knowledge and tools needed to effectively manage crop health, representing a significant advancement in precision agriculture and the promotion of sustainable farming practices. Additionally, the chatbot employs a carefully crafted dialogue flow, ensuring seamless communication and providing farmers with intuitive guidance throughout their interaction with the application.

Key Words: Web application, FastAPI, VGG16 Convolutional Neural Network (CNN), User-friendly interface, Chatbot

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1. INTRODUCTION

Machine learning (ML) is a subset of AI that focuses on algorithms and statistical models that enable machines to improve their performance on a task through experience. One of the foundational concepts in AI and ML is the artificial neural network (ANN), which is a computational model inspired by the structure and function of the human brain. Our project aims to integrate various illness prediction models into a single web interface, providing users with accurate findings and severity degree based on submitted data. The proposed algorithm for crop disease detection is based on a Convolutional Neural Network (CNN) model, specifically the VGG-based deep learning model. This model is trained on a dataset containing images of healthy and diseased crops for six crop types: Paddy, Tomato, Potato, Wheat, Corn, and Pepper. The VGG architecture is renowned for its effectiveness in image classification tasks, making it ideal for handling complex image features. In addition to the CNN model, our system integrates Dialogflow, a natural language understanding platform, to provide a user-friendly chatbot interface. This integration enhances user interaction and accessibility, allowing users to easily input data and receive accurate predictions and recommendations. By combining the power of CNNs, VGG architecture, and Dialogflow, our project aims to revolutionize crop disease detection and management, providing farmers with a comprehensive and efficient solution.

1.1. OBJECTIVE

➔ **LITERATURE SURVEY[6]:**Ferentinos, K.P. (2018). Deep learning models for plant disease detection and diagnosis. Computers and Electronics in Agriculture, 145, 311-318.

- The paper provides an overview of the existing methodologies for plant disease detection, emphasizing the need for accurate and efficient detection systems in agriculture.
- Ferentinos discusses the application of deep learning models, particularly convolutional neural networks (CNNs), in the field of agriculture for tasks such as plant disease detection. This highlights the growing trend of using advanced technologies in farming practices.
- The paper likely addresses the limitations of current crop disease detection systems, such as their focus on single crops and the lack of comprehensive information provision.