PRESIDENCY UNIVERSITY
Private University Estd. in Karnataka State by Act No. 41 of 2013
Itgalpura, Rajankunte, Yelahanka, Bengaluru – 560064

AI-Driven Crop Disease Prediction and Management System

A PROJECT REPORT

Submitted by

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BACHELOR OF TECHNOLOGY

IN

INFORMATION SCIENCE AND ENGINEERING

PRESIDENCY UNIVERSITY

BENGALURU

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PRESIDENCY SCHOOL OF COMPUTER SCIENCE AND ENGINEERING

BONAFIDE CERTIFICATE

Certified that this report "**AI-Driven Crop Disease Prediction and Management System**" is a Bonafide work of "HARSHITHA V (20221ISE0077), TAANYA SUBBAIAH B (20221ISE0082), M ASWIN (20221ISE0065)", who have successfully carried out the project work and submitted the report for partial fulfilment of the requirements for the award of the degree of BACHELOR OF TECHNOLOGY in INFORMATION SCIENCE AND ENGINEERING during 2025-26.

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DECLARATION

We the students of final year B.Tech in INFORMATION SCIENCE AND ENGINEERING at Presidency University, Bengaluru, named HARSHITHA V, TAANYA SUBBAIAH B, M ASWIN, hereby declare that the project work titled **"AI-Driven Crop Disease Prediction and Management System"** has been independently carried out by us and submitted in partial fulfilment for the award of the degree of B.Tech in INFORMATION SCIENCE AND ENGINEERING during the academic year of 2025-26. Further, the matter embodied in the project has not been submitted previously by anybody for the award of any Degree or Diploma to any other institution.

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ABSTRACT

Agriculture is among the most significant industries that guarantees of world's food supply and economic sustainability. Crop diseases are a major problem, with about 40 percent of the total crop yield lost annually. Conventional methods of detecting these diseases like manual inspection by skilled personnel is time consuming and expensive as well as inaccurate in detection when applied on vast agricultural areas.

The emergence of Artificial Intelligence (AI) and especially, Machine Leaming (ML) and Deep Leaming (DL) has provided a new course in the direction of contemporary agriculture. The technologies offer quicker, dependable, and economical ways of detecting and monitoring disease in its early stages. In this work, we examine Convolutional Neural Networks (CNNs) and Vision Transformers (ViTs), for identifying and classifying crop diseases based on leaf images using automated image analysis. We also address the general workflow of the system -- beginning with the collection of data through remote sensing and IoT-based sensors; continuing with the data preprocessing step, the training and the deployment of models on cloud and edge computing.

Agricultural datasets that are publicly available are explored to analyse various aspects of their problems, including data imbalance, bias, and limited real-world generalization. Evaluation of the key performance measures of AI models including accuracy, precision, recall, and F1 score are performed, giving us values of 99.0%, 98.7%, 98.9%, and 98.8% respectively. This work can be extended by developing hybrid models combining various AI methods, optimization of multi-modal data integration based on satellite, soil, and weather data, and the application of Federated Leaming to preserve the privacy of farmer data and increase scalability.