

# **Plant Disease Detection Using Deep Learning & Machine Learning**

**A PROJECT REPORT**

*Submitted by,*

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*Under the guidance of,*

**Ms. Sandhya L**

*in partial fulfillment for the award of the degree of*

**BACHELOR OF TECHNOLOGY**

**IN**

**COMPUTER SCIENCE AND ENGINEERING WITH DATA SCIENCE**

**At**



**PRESIDENCY UNIVERSITY**

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## ABSTRACT

The field of automation has been revolutionized by recent progress in machine learning, especially deep learning, impacting various sectors including agriculture. Plant disease detection, a crucial element affecting crop production and economic stability, has emerged as a key application of this technology. In the past, identifying plant diseases relied on time-consuming, expensive, and error-prone manual inspections by agricultural specialists. This project aims to tackle these issues by creating an automated system for plant disease detection using deep learning methods, specifically Convolutional Neural Networks (CNNs). The system is implemented as a user-friendly, interactive web application built with StreamLit, an open-source framework for creating dynamic, data-driven applications. The primary objective of this project is to leverage deep learning to accurately identify and classify plant diseases based on leaf imagery. By analysing visual disease indicators, the system categorizes images into specific disease classes. The system's development encompassed several key stages: data collection, preprocessing, model training, and deployment. A comprehensive, labelled dataset of plant leaf images from diverse species was used to train the model. Preprocessing techniques were applied to enhance image quality, reduce noise, and emphasize important features, significantly improving the model's accuracy and efficiency. A CNN-based deep learning model was then trained and fine-tuned to achieve accurate results. Once the model demonstrated high accuracy, it was implemented as a real-time interactive platform. Through the StreamLit interface, users can easily upload plant leaf images, and the system will detect the disease, predict its category, and provide relevant information, including potential treatments. The study's results indicate that the CNN model can detect and classify plant diseases with remarkable accuracy. This solution is particularly valuable for users in rural or remote areas, where expert agricultural services are often limited. By delivering real-time predictions through an intuitive platform, this project offers a scalable, efficient, and cost-effective alternative to traditional methods. In summary, this system bridges the gap between advanced deep learning technologies and practical agricultural needs. By combining state-of-the-art machine learning with a user-friendly interface, it empowers farmers and agricultural professionals to make informed decisions, safeguard crop health, and enhance agricultural productivity.

*Index Terms* — Deep learning, CNN, Plant Diseases, Classification, Machine Learning

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**DECLARATION**


We hereby declare that the work, which is being presented in the project report entitled **Plant Disease Detection Using Deep Learning and Machine Learning** in partial fulfillment for the award of Degree of **Bachelor of Technology in Computer Science and Engineering with Data Science**, is a record of our own investigations carried under the guidance of **SANDHYA. L**, Assistant Professor, School of Computer Science Engineering & Information Science, Presidency University, Bengaluru.

We have not submitted the matter presented in this report anywhere for the award of any other Degree.


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**CERTIFICATE**


This is to certify that the Project report **“Plant Disease Prediction Using Deep Learning & Machine Learning”** being submitted by GANGADHAR V GUDIMATH, NAVEEN KUMAR M, MOHAMMED ISMAIL J bearing roll number: 20211CSD0120, 20211CSD0121, 20211CSD0176 in partial fulfillment of the requirement for the award of the degree of Bachelor of Technology in Computer Science and Engineering with Data Science is a bonafide work carried out under my supervision.

  
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