IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Ai-Powered Plant Disease Scanning And Solutions

[1]Manish, [2]Thanish, [3]Shreedhyan, [4]Tanzil

[1]Student, [2]Student, [3]Student, [4]Student

[1]Information Science and Engineering,

[1]Yenepoya Institute of Technology, Mangalore, India

Abstract:

Plant diseases pose a serious threat to agricultural productivity, often leading to significant crop losses. This paper is designed to provide an AI-powered system that utilizes computer vision and deep learning to analyze plant images, accurately detect diseases, and provide both organic and inorganic treatment solutions. By enabling real-time disease diagnosis, the system empowers farmers with timely and effective interventions, promoting sustainable farming practices, reducing dependency on manual inspections, and improving overall crop health and yield.

I. INTRODUCTION

Plant diseases are a critical challenge in agriculture, affecting crop health, reducing yields, and causing significant economic losses worldwide. Traditional methods of disease detection rely on manual inspection by experts, laboratory testing, or trial-and-error approaches, which are often slow, expensive, and impractical for large-scale farming. Delayed or inaccurate diagnosis can lead to severe crop damage, increased use of chemical treatments, and unsustainable farming practices. To address these issues, AI-Powered Plant Disease Scanning & Solutions leverages artificial intelligence, machine learning, and computer vision to provide an efficient, accurate, and user-friendly solution for plant disease detection. By simply capturing an image of an affected plant, users can instantly receive real-time diagnostic results along with tailored organic and inorganic treatment recommendations. This system not only enables early intervention but also helps farmers adopt data-driven and sustainable farming practices**,** reducing unnecessary pesticide usage and promoting eco-friendly solutions whenever possible. Designed to support farmers, agronomists, and agricultural professionals, this AI-powered tool enhances efficiency, minimizes losses, and contributes to a more resilient and technology-driven agricultural ecosystem**.** With its accessibility and ease of use, the system empowers even small-scale farmers with advanced disease detection capabilities, ensuring healthier crops, higher productivity, and long-term agricultural sustainability.

II. RELATED WORKS

From our research we found that the current existing “plant disease detection software’s ” contains limited amount of data and the quality of data are also not up to the mark. The current software may also struggle with real-time disease detection in uncontrolled environments due to complex backgrounds and varying lighting conditions. AI models are computationally expensive and cannot run efficiently on some of the devices. Some Currently existing “plant diseases detection software’s” have complex user interface which makes farmers difficult to understand the features and them may also find it difficult to use them since they lack in technical knowledge. The effectiveness of disease detection heavily relies on the accuracy of the system .AI model still lack in identifying key factors of plants such as color of leaf’s ,type of plant etc. Improving this will automatically increase the accuracy of software and can provide better organic and

inorganic solutions to prevent the diseases. Many AI software's are designed for English-speaking users, which limits adoption by local.

III. Conclusion

In the future, this project will focus on developing a more accurate, efficient, and user-friendly plant disease detection system. The aim is to build a comprehensive dataset that includes various plant species, disease stages, and environmental conditions to improve the model's learning and accuracy. The system will be optimized to run smoothly on low-resource devices, ensuring accessibility for a wider range of users. Special attention will be given to creating a simple and intuitive interface, possibly with support for local languages, to make it more usable for farmers. The detection model will be designed to function reliably in real-time and under different environmental conditions. By improving the identification of key plant features and providing both organic and inorganic treatmen suggestions, the project aims to deliver a practical tool that supports farmers in managing plant health more effectively.

References

[1] A. Bhargava, A. Shukla, O. P. Goswami, M. H. Alsharif, P. Uthansakul and M. Uthansakul, "Plant Leaf Disease Detection, Classification, and Diagnosis Using Computer Vision and Artificial Intelligence: A Review," in *IEEE Access*, vol. 12, pp. 37443-37469, 2024.

[2] R. Praveen, U. Hemavathi, R. Sathya, A. Abubakkar Siddiq, M. Gokul Sanjay and S. Gowdish, "AI Powered Plant Identification and Plant Disease Classification System," *2024 4th International Conference on Sustainable Expert Systems (ICSES)*, Kaski, Nepal, 2024.

[3] A. Oad *et al*., "Plant Leaf Disease Detection Using Ensemble Learning and Explainable AI," in *IEEE Access*, vol. 12, pp. 156038-156049, 2024.

[4] M. Z. Elsayed, A. Hasoon, M. K. Zidan and S. M. Ayyad, "Role of AI for Plant Disease Detection and Pest Detection," *2024 International Telecommunications Conference (ITC-Egypt)*, Cairo, Egypt, 2024.