Intelligent Crop Disease Detection using Multimodal Integration

develop this kind of project by taking above mentioned requirements.

Abstract:

Crop production is critical for the agricultural industry and farmers' economic well-being, with plant diseases posing a significant threat to yield. This paper reviews the use of various Deep Convolutional Neural Network (CNN) architectures for plant disease detection through leaf photographs, providing a comparative analysis of trained models. Additionally, it introduces CROPCARE, a sustainable real-time crop disease detection and prevention system that integrates mobile vision, Internet of Things (IoT), and Google Cloud services. Utilizing the superresolution convolution network (SRCNN) and MobileNet-V2, CROPCARE offers recommendations on soil and weather conditions, disease prevention methods, supporting both Hindi and English languages. Furthermore, the paper presents an automated system for early crop disease detection, emphasizing the model's adaptability for diverse crops in smart farming. The system achieves high accuracy (97.09%) in classifying crops and disease types, demonstrating its potential for widespread application.

Introduction:

Agriculture, serving as a backbone to economic development, relies heavily on efficient crop production and growth. The success of the agricultural industry is pivotal not only for economic prosperity but also for the well-being of individual farmers and societies at large. However, this success is frequently hampered by various challenges, and one of the significant contributors to crop failure is the prevalence of plant diseases. These diseases manifest through various signs, such as infections, color changes, damaged leaves or stems, abnormal growth patterns in different plant parts, and other discernible indicators. Recognizing and addressing these diseases at an early stage is crucial for mitigating their impact on crop quality and yield.

In recent years, advancements in technology, particularly in the fields of deep learning, Internet of Things (IoT), and computer vision, have offered innovative solutions to tackle the challenges faced by the agricultural sector. This research paper aims to explore and analyze the utilization of Deep Convolutional Neural Network (CNN) architectures for the detection of plant diseases. The focus is on leveraging these technologies to develop intelligent systems capable of early and accurate identification of crop diseases through the analysis of leaf photographs.

The first section of our exploration delves into the various causes of crop failure, emphasizing the role of plant diseases in this context. Understanding the signs and symptoms of plant diseases is essential for effective disease detection. These signs include infections, color changes, damaged leaves or stems, abnormal growth patterns in different plant parts, and other visible indicators. The impact of crop failure is profound, affecting not only the economic aspects of farming but also the social fabric of farming communities. Farmers face numerous challenges, and addressing the issue of plant diseases becomes paramount for sustainable agricultural practices.

