Plant Disease Detection Using Machine Learning Techniques

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Abstract- *India is a fast-developing country and agriculture is the back bone for the country's development in its early stage. However, agricultural field faces lots of hurdles including huge loss in the crop production. Plant leaf diseases are one of the important reasons for the loss in the production and plant leaf disease identification is also very difficult in agriculture field.Hence, machine learning; a reliable prediction methodology is used for detecting various diseases of plant leaves caused by fungus, bacteria and virus. However, disease prediction using classification algorithms appears to be a difficult task as the accuracy varies for different input data.*

I. INTRODUCTION

Plant leaf diseases are the problem with fungus infections. It leaves traces on the leaves. We need to take care of it because of the big loss. Other places of the world also experience a lot of issues with farmers. Farming is affected. Lesions on watermelons can develop Anthracnose and Alter aria. Excessive pesticide use in plants increases costs. Nature suffered. To solve this problem, the right amount of insecticides must be used. Thus, we can use machine learning. It will help with early sickness detection. It will be used to identify illnesses.

It is getting harder and harder to identify plant diseases from their visible symptoms on plant leaves. Even seasoned agricultural experts and plant pathologists frequently struggle to accurately diagnose specific diseases, which results in them drawing incorrect conclusions and worrying solutions. This is because of the complexity, the wide variety of cultivated crops, and the phytopathological problems they currently face. An automated system designed to assist in the identification of plant diseases by the appearance of the plants and visual signs would be very helpful to amateur farmers. This important tactic will be appreciated by farmers as it will alert them just in time to stop the disease from spreading across a large area

II. LITERATURE SURVEY

Factors influencing the use of deep learning for plant disease recognition

In-deep learning quickly becomes one of the most important tools for image editing. This technology is now beginning to be used in plant disease identification and recognition activities. The positive results obtained using this method hide some issues that are rarely considered in relevant tests. This article introduces an investigation into the key factors affecting the formation and function of deep neural networks used in plant pathology. The database, which contains about 50,000 images, was made available for free for educational purposes.

An optimized dense convolutional neural network model for disease recognition and classification in corn leaf.

An improved convolutional neural network (CNN) (DenseNet) framework for the detection of maize leaf disease is proposed in this paper. Maize is one of the most widely grown cereals in the world. Maize plants are susceptible to certain leaf diseases such as maize rust, corn gray leaf spot, and northern corn leaf blight are more common. Symptoms of these leaf diseases are indistinguishable from the stages of their development. Therefore, current research provides a solution for in-depth study to monitor plant health and, in turn, will lead to increased value and quality of plant production. The proposed DenseNet upgrade model achieved 98.06% accuracy. Besides, it uses very small parameters compared to existing CNN variants such as EfficientNet, VGG19Net, NASNet, and Xception Net.

Real-Time Detection of Apple Leaf Diseases Using Deep Learning Approach Based on Improved Convolutional Neural Networks

Alternaria leaf spot, Brown spot, Mosaic, Gray spot, and Rust are the most common types of apple leaf diseases that greatly affect the apple crop. However, current research does not provide an accurate and fast detector for apple diseases to ensure the healthy development of the apple

industry. This paper proposes an in-depth study approach based on the convolutional neural network (CNNs) for real-time diagnosis of apple leaf diseases. In this paper, the apple leaf (ALDD) data set, composed of laboratory images and complex diagrams under real-world conditions, was first developed by increasing data and image annotation technology. Based on this, the diagnosis of a new apple leaf disease

New perspectives on plant disease characterization based on deep learning

Plant disease control is a major challenge to ensure global food security and sustainable agriculture. Many recent studies have proposed to improve existing methods of diagnosing plant diseases early using modern automated image recognition systems based on in-depth study. In this article, we will study these methods in more detail, especially those based on convolutional neural networks. We first examined whether it was more appropriate to fine-tune a pre-trained model in the field of crop identification than to recognize the normal function. In particular, we demonstrate, by visual cues, that the characteristics studied vary according to the accepted method and that they do not focus on the affected area.

III. EXISTING SYSTEM

Plant pathologists or horticulture specialists typically utilise their empty eyes to detect leaf problems today. This approach to identifying plant leaf infections required a great deal of labour and in-depth expertise in plant disease, and it might be emotionally exhausting, time-consuming, and cost-effective.

IV. PROPOSED SYSTEM

The suggested methodology evaluated the leaf ailments. The proposed system asks for a certain departure image. The illustration will show the leaf to have a number of diseases. The health of the leaf will be displayed, and any specific diseases will be shown if the leaf is unwell. The treatments for the disorders are then provided.

V. SYSTEM IMPLEMENTATION

The process through which a theoretical idea is turned into a practical tool is called implementation. The consumer department is now bearing the brunt of resistance and the impact on existing practises. The most important stage in the creation of a new system, and the user must have faith that the new system will function and be effective, is the implementation process. If this process is not planned and managed, it can cause confusion.

The process of utilising the created system is known as programme implementation. This covers all activities related to using the new programme. Once the planning is finished, the organization's first priority is to make sure that the systems' procedures are functioning properly. Before the implementation process can begin, several requirements must be satisfied.

Fig 2: In this figure show the plant disease identification

VI. CONCLUSION

In this work, specific convolutional neural network designs were used to build specialised deep learning models for the identification of plant diseases utilising plain pictures of healthy or diseased leaves.

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