LITRATURE SURVEY

Fertilizers Recommendation System For Disease Prediction

INTRODUCTION

In recent times different techniques have been proposed by various people to overcome this problem. Some survey papers are given below.

LITERATURE PAPERS AND APPROACHES

1. "Identification of Plant-Leaf Diseases Using CNN and Transfer-Learning Approach" – MDPI 2021

Authors: Sk Mahmudul Hassan, Arnab Kumar Maji, Michał Jasiński, Zbigniew Leonowicz and Elżbieta Jasińska

https://doi.org/10.3390/electronics10121388

Description

In this paper, deep convolutional-neural-network (CNN) models are implemented to identify and diagnose diseases in plants from their leaves, since CNNs have achieved impressive results in the field of machine vision. They have replaced standard convolution with depth-separable convolution, which reduces the parameter number and computation cost. The implemented models were trained with an open dataset consisting of 14 different plant species, and 38 different categorical disease classes and healthy plant leaves. The implemented models achieved a disease-classification accuracy rates of 98.42%, 99.11%, 97.02%, and 99.56% using InceptionV3, InceptionResNetV2, MobileNetV2, and EfficientNetB0, respectively, which were greater. In comparison with other deep-learning models, the implemented model achieved better performance in terms of accuracy and it required less training time. The accuracy results in the identification of diseases showed that the deep CNN model is promising and can greatly impact the efficient identification of the diseases, and may have potential in the detection of diseases in real-time agricultural systems.

2. “Plants Diseases Prediction Framework: A Image-Based System Using Deep-Learning” - IEEE 2022

Authors: Madhu Kirola, Kapil Joshi, Sumit Chaudhary, Neha Singh, Harishchander Anandaram, and Ashulekha Gupta.

https://doi.org/10.1109/AIC55036.2022.9848899

Description

In this paper they have detected plant diseases using machine learning techniques. The disease detection method includes image acquisition, image pre-processing, image segmentation, feature extraction, and classification. They suggested an automatic system to diagnose plant diseases and identify its category. The goal of their proposed research is to examine several machine algorithms for plant disease prediction.

The paper proposed a framework for disease and healthiness detection in plants and the classification of diseases based on symptoms appearing on a leaf. The diseases are grouped into three categories in the paper: bacterial, viral, and fungal. To conclude, the research paper investigates all of these factors and uses several machine learning techniques and deep learning techniques. The machine learning techniques used in the research work are SVM, KNN, RF (Random Forest), LR (Logistic Regression), and the deep learning (DL) technique used is-Convolutional Neural Network (CNN) for disease prediction in the plants. Following that, a comparison of machine learning and deep learning methodologies was conducted.

Their conclusions are as follows: RF (Random forest) has the highest accuracy of 97.12% among machine learning classifiers, however, in comparison to the deep learning model mentioned in the study, the CNN classifier has the highest accuracy of 98.43 %

3. “Detection Of Leaf Diseases in Pulses, Fruits and Vegetables” - IEEE 2022

Authors: R. Sowjanya, T. Lakshmi Prasanna, P. Ashwak Khan, P. Ranga Rao, C.S.S. Anupama

https://doi.org/10.1109/ICACCS54159.2022.9785295

Description

In this paper, an automated approach for the prediction and categorization of plant leaf diseases is investigated. Additionally, a look at several methods for diagnosing plant leaf diseases is also covered in-depth. The suggested system would use image processing and segmentation techniques methods to detect leaf diseases in pulses, fruits and vegetable plants. An enhanced CNN model is used for this purpose. The enhanced CNN model is constructed and trained on a dataset of 20,600 photo. In order to increase system prediction accuracy and the categorization of genuine positive samples, optimization is carried out. This model induced 93.18 percent more accurate predictions may be made for 3 different species with twelve distinct illnesses using the approach now under consideration.

4. “Leaf Disease Identification: Enhanced Cotton Leaf Disease Identification Using Deep CNN Models” - IEEE 2021

Authors: P. Sivakumar; N. Sri Ram Mohan; P. Kavya; P. Vinay Sai Teja

https://doi.org/10.1109/ICISSGT52025.2021.00016

Description

In this paper they try to combine a piece of agriculture area with the help of Artificial Intelligence to reduce the loss due to infections of plant leaves. In order to solve this problem, they have used the transfer learning models which were constructed with various CNN architectures like ResNet50, VGG19, InceptionV3, and ResNet152V2. They conducted experiments with these four methods on the standard cotton leaves dataset, to know which method gives the better performance in identifying cotton leaf diseases. The Experimental results show that ResNet50, VGG19, InceptionV3, and ResNet152V2 are giving 75.76%, 87.64%, 96.46%, 98.36% respectively. Among the four models ResNet152V2 with parameters 60,380,648 gave more

accuracy. So, this idea of using transfer learning method called ResNet152V2 for disease detection in plant is very useful and also gives more accuracy.

5. "Recognition of Jute Diseases by Leaf Image Classification using Convolutional Neural Network" - IEEE 2019

Authors: Md. Zahid Hasan; Md. Sazzadur Ahamed; Aniruddha Rakshit; K. M. Zubair Hasan

https://doi.org/10.1109/ICCCNT45670.2019.8944907

Description

In this paper, their research work focuses on the finding prominent accuracy of the jute leaf image diseases using deep learning approach. Acquiring the better performance in disease identification is the main purpose of this paper. Among different types of jute leaf diseases, they have selected Chlorosis and Yellow Mosaic to recognize the diseased leaves from the healthy leaves. They used a dataset of 600 images, proposed model is aimed to classify two common jute leaf diseases. CNN achieves an overall accuracy of 96% without applying any image preprocessing and feature extraction method. The results suggest that proposed deep learning model provides an improved solution in disease control for jute leaf diseases with high accuracy.

CONCLUSION

The related papers chosen for survey gave various insights on different methods available for detecting diseases in plants via image recognition of the plant leaf. The most recommended model for this problem solution is the CNN deep learning model with provides better accuracy then other machine learning techniques. Hence, CNN approach is suitable to detection of plant diseases in plants by examining their leaves.