FERTILIZER RECOMMENDATION SYSTEM FOR DISEASE PREDICTION

INTRODUCTION

Disease prediction in plants is used to detect and recognize the plant diseases. The disease may lead to abnormal functionalities which may lead to the death of the plant. Computer vision and image processing are used to capture and analyze images of the plants and their parts like leaves. By analyzing the images, based on certain symptoms like yellowing of leaves, curling, black spots, etc., the deficit nutrients that lead to the disease are found. Based on the available data on fertilizers, the necessary nutrient rich fertilizers are recommended.

LITERATURE REVIEW

[1]. Plant Infection Detection Using Image Processing

Advantage: This system was capable of identifying the infection and classifies them accordingly with 98.27% of accuracy. This automated system reduces time of detection and labour cost.

Disadvantage: The farmers must afford mobile phones or digital camera to take images of infected leaves of different plants.

Algorithm used: Infections are detected based on K-means clustering and GLCM techniques. GLCM is used for texture analysis, while K-mean segmentation technique uses hue estimation method for dividing and clustering the image.

[2]. Prediction of crop yield and fertilizer recommendation using machine learning algorithms-

Advantage: It recommends fertilizer suitable for every particular crop.

Disadvantage: Requires Third Party applications to display information on weather, temperature, humidity, atmospheric pressure, etc.

Algorithm used: Random Forest and Support Vector Machine algorithms are used for the classification of the soil to classify, display confusion matrix, Precision, Recall, predict crop based on the given inputs, etc.

[3]. Plant Disease Detection Using Image Processing and Machine Learning

Advantage: Accuracy scores were 93% which is nearly equal to f1 scores. It requires less time for prediction than other deep learning-based approaches since it uses statistical machine learning and image processing algorithm.

Disadvantage: The proposed system is able to detect 20 different diseases only.

Algorithm used: Random Forest classifier, a combination of multiple decision trees is used where each tree is trained by using different subsets of the whole dataset to reduce the overfitting and improves the accuracy of the classifier.

[4]. Fertilizers Recommendation System for Disease Prediction in Tree Leaves

Advantages: Recommend the fertilizer for affected leaves and its measurement or quantity are suggested based on severity level of the disease.

Disadvantage: The proposed algorithm cannot be used to identify the disease that affects the other plant organs such as stems and fruits.

Algorithm used: Support Vector Machine (SVM) algorithm classifies the leaf image as normal or affected. And it is used to identify a function Fx which obtain the hyper-plane.

[5]. Farmer's Assistant: A Machine Learning Based Application for Agricultural Solutions

Advantages: It is expected that boosting (Random Forest) and bagging (XG Boost) models will usually perform and generalize better than non-ensemble methods.

Disadvantage: This model performs well only on the images which are from those classes that the model already knows and it will not be able to detect the correct class for any data that is out of the domain.

Algorithm used: XGBoost, which stands for Extreme Gradient Boosting, is a scalable, distributed gradient-boosted decision tree (GBDT) machine learning library. It provides parallel tree boosting and is the leading machine learning library for regression, classification, and ranking problems. Random forest algorithm is also used.

[6]. Cloud Based Automated Irrigation and Plant Leaf Disease Detection System Using an Android Application.

Advantage: It is simple and cost-effective system for plant leaf disease detection.

Disadvantage: Any H/w failures may affect the system performance.

Algorithm used: K-means clustering is used for feature extraction.

[7]. Detection of Leaf Diseases and Classification using Digital Image Processing.

Advantage: The system detects the diseases on citrus leaves with 90% accuracy.

Disadvantage: System only able to detect the disease from citrus leaves.

Algorithm used: K-Means Clustering used for image segmentation and then system extract the GLCM features from disease detected images. The disease classification done through the SVM classifier.

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