Literature Survey

Fertilizer Recommendation System for Disease Prediction

Introduction:

In today's society, agriculture is the most significant industry. An extensive range of bacterial and fungal diseases harm the majority of plants. Plant diseases severely limited productivity and posed a serious threat to food security. To achieve maximum quantity and optimum quality, early and accurate identification of plant diseases is crucial. The variety of pathogen strains, adjustments to production practises, and insufficient plant protection systems have all contributed to an increase in the number of plant diseases in recent years, as well as the severity of the damage they inflict.

An automated technique is now available to recognise many plant diseases by examining the symptoms seen on the plant's leaves. In order to identify diseases and provide preventative measures, deep learning algorithms are applied.

Literature Review:

[1] Totally 54% of India's land area is deemed arable, making it the world's largest agrarian economy. Soil infertility owing to over fertilization, as well as a lack of access and awareness of contemporary agricultural practices, are the different factors that contribute to low agricultural production. The main purpose of this research work is to develop a machine learning-based recommendation system to increase agricultural productivity. A variety of datasets were used in this study to design and develop advanced models to estimate the crop, recommend fertiliser, and identify plant disease. An algorithm called MobileNet uses an image of a leaf to identify the disease present in a plant. The XGBoost model predicts a suitable crop based on the local soil nutrients and rainfall. Random Forest [RF] model was used to propose fertilizer and develop ideas for improving soil fertility depending on nutrients present in the soil. When compared to other approaches, the proposed model delivers a high level of accuracy.

[2] Detection and recognition of plant diseases using machine learning are very efficient in providing symptoms of identifying diseases at its earliest. Plant pathologists can analyze the digital images using digital image processing for diagnosis of plant diseases. Application of computer vision and image processing strategies simply assist farmers in all of the regions of agriculture. Generally, plant diseases are caused by the abnormal physiological functionalities of plants. Therefore, the characteristic symptoms are generated based on the differentiation between normal physiological functionalities and abnormal physiological functionalities of the plants. Mostly, the plant leaf diseases are caused by Pathogens which are positioned on the stems of the plants. These different symptoms and diseases of leaves are predicted by different methods in image processing. These different methods include different fundamental processes like segmentation, feature extraction and classification and so on. Mostly, the prediction and diagnosis of leaf diseases are dependent on the segmentation such as segmenting the healthy tissues from diseased tissues of leaves.

[3] This method used datasets to find diseased and healthy plant leaves. we introduced a deep convolutional neural network to identify crop series and diseases that may not be present in the plant tissue. The model trained on the test set has an accuracy of 99.35%. This process is enabled by deep learning, machine learning and digital epidemiologyA neural network associate’s images of diseased plants and crops as a pair. A neural network node is a

mathematical function that receives numerical inputs from input edges and provides numerical outputs as output edges. We analyze 54,306 images of plant leaves that have been assigned a variance of 38 class labels. We resize the images to 256x256 pixels and perform both model optimization and prediction on these reduced images.

Advantages: this system identifies the diseases that may not be present in the plant issue.

[4] Data mining is a rising studies area in crop yield analyis Yield predicition is a complete essential problem in agriculture. Any farmer is interested in knowing how muchyield he is about to expect also, it will end-user-helpful to farmers for indicting which fertilizers to be used as well as knowing the crop diseases all at one place. The project comes with a model to be precise and accurate in predicting crop, fertilizers, Crop disease and deliver the end-user with proper recommendations about the required fertilizer ratio based on atmospheric and soil parameters of the land which enhance to increase the crop yield and increase farmer revenue.

[5] In this paper, the disease classification was initially performed by the International Center for Tropical Agriculture (CIAT) with banana images as input, which was transferred to the primary processing technique. A hybrid segmentation called the generalized variation fuzzy mean sum (TGVFCMS) was used to segment the affected leaf area. After segmentation, the data is passed to CNN for final review classification. It has a database of more than 18,000 real photos of bananas in the CIAT image gallery. The dataset includes dry/aged leaves (DOL), HP and 700 balanced images of 5 major diseases such as banana Fusarium wilt of Banana (FWB), Black Sigatoka (BS), Xanthoma wilt or bacterial banana wilt (BBW) , Yellow Sigatoka (YS) and banana pustulosis.

[6] This proposed system explains about the water needs of plants vary from place to place due to changes in soil content, texture, climatic factors, and more. In addition to water requirements, plant diseases can also cause plants not to grow properly. In this article, we proposed a new intelligent irrigation system that can automatically control irrigation using an Android mobile application. In addition, photos of plant leaves are captured and sent to the cloud server. This is further processed and compared with images of diseased plant leaves in the cloud database. Based on the comparison, a list of suspected plant diseases is displayed to the user via an Android mobile application.

[7] India is an agrarian nation. But creating a profitable yield for the farmer in each crop cycle is becoming a major challenge on various factors. Picking the reasonable fertilizer for the land and yield is an important and basic part of agriculture. Deciding the supplement levels in soil utilizing lab hardware can be restrictively costly, particularly in developing nations. The current frameworks on deciding soil nutrient substance and proposal for fertilizer isn't sufficiently proficient efficient enough. This paper introduces a compelling technique for estimation of nutrient dimension in soil and suggestion for appropriate fertilizer. The proposed methodologies comprise of four stages: soil analysis, data pre-processing, data analysis and Recommendation. The soil sample is analyzed using an IoT based device utilizing NPK sensor with two electrodes are set to calculate collect the NPK ratio of the soil nutrient and for pre-processing, the data gathered from sensors are figured into correct dataset and machine learning algorithm is utilized to recognize the reasonable fertilizer. This venture is extremely valuable to farmer to pick the right fertilizer toward the start of product cycle and amplify the yield.

[8] This paper presents a methodology for classifying three major leaf diseases of banana using local textural characteristics. Disease-affected regions are identified using image enhancement and color segmentation. The segmented image is transformed into one transform domain using three Image transforms (DWT, DTCWT, and ranklet transforms). Feature

vectors are extracted from transform-domain images using LBP and its variants (ELBP, MeanELBP, and MedianELBP). Experimental results showed the best classification performance of ELBP features extracted from the DTCWT domain (accuracy 95.4%, accuracy 93.2%, sensitivity 93.0%, Fscore 93.0%, and specificity 96.4%).

References:

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