LITERATURE SURVEY

Article 1

Fertilizers Recommendation System For Disease Prediction In Tree Leave

R. Neela, P. Nithya

Abstract: Agriculture is the main aspect of country development. Plant disease on leaves is one of the major factors of reductions in both quality and quantity of the food crops. Finding the leaf disease is an important role of agriculture preservation. After preprocessing using a median filter, segmentation is done by Guided Active Contour method and finally, the leaf disease is identified by using Support Vector Machine. The disease-based similarity measure is used for fertilizer recommendation.

INTRODUCTION:

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. Different symptoms and diseases of leaves are predicted by different methods in image processing. These different methods include different fundamental processes

- segmentation
- feature extraction
- classification

Mostly, the prediction and diagnosis of leaf diseases are dependent on the segmentation such as segmenting the healthy tissues from diseased tissues of leaves.

MATERIAL AND METHODS:

A digital camera or similar devices are used to take images of different types, and then those are used to identify the affected area in leaves.

Image Classification Steps :

- Image acquisition:
  To get the image of a leaf to evaluate in the direction of a class.
- Preprocessing:
  The purpose of image preprocessing is improving image statistics. The preprocessing receives an image as input and generates an output image as a grayscale,an invert and a smoothed one.
- Segmentation:

Implements Guided active contour method. Unconstrained active contours applied to the difficult natural images. Dealing with unsatisfying contours, which would try and make their way through every possible grab cut in the border of the leaf.

- Disease Prediction:
  Leaves are affected by bacteria, fungi, virus, and other insects. Support Vector Machine (SVM) algorithm classifies the leaf image as normal or affected based on leaf features such as color, shape, textures. Then a hyperplane was constructed to categorize the pre-processed leaves and also implement a multiclass classifier, to predict diseases in leaf image with improved accuracy.
- Fertilizer Recommendation:
  Recommend the fertilizer for affected leaves based on severity level. Fertilizers may be organic or inorganic. Admin can store the fertilizers based on disease categorization with severity levels. The measurements of fertilizers suggested based on disease severity.

Article 2
Plant Disease Detection and Fertilizer Suggestion
Authors: Apurva Save, Aksham Gupta, Sarthak Pruthi, Divyanjana Nikam, Prof. Dr. Shilpa Paygude

Plant disease diagnosis is the foundation for efficient and precise plant disease prevention in today\'s complicated environment. Plant disease identification has become digitized and data-driven as smart farming has grown, allowing for advanced decision support, smart analysis, and planning. This work provides a deep learning-based mathematical model for detecting and recognising plant diseases, which improves accuracy, generality, and training efficiency. The prevention and control of plant disease have consistently been broadly talked about in light of the fact that plants are presented to the external climate and are profoundly inclined to diseases. Typically, the precise and quick diagnosis of disease assumes a significant part in controlling plant disease, since helpful protection measures are frequently carried out after right diagnosis Identification of the plant diseases is the way to prevent the misfortunes in the yield and amount of the rural item. Early Detection of Plant Leaf Disease is a significant need in a developing horticultural economy like India. Without legitimate recognizable proof of the disease, disease control measures can be an exercise

in futility and cash and can prompt further plant misfortunes. Our task proposes a profound learning-based model which will be trained utilizing a dataset containing pictures of healthy and diseased crop leaves. The model will serve its target by ordering pictures of leaves into diseased classes dependent on the example of imperfection. The framework effectively recognizes various sorts of disease found in Tomato Crop.

SYSTEM DESIGN

The basic methodology of our project is that the image is input into our model using a website which we have integrated using Flask with our model where the user will upload the leaf image with a uniform background. The image will be then preprocessed. Features are extracted by the model itself so as to classify the correct disease. Once the disease is classified, it is mapped with the correct remedy or the fertilizer which would be required to eradicate the problem and to fight off the disease in the future too.

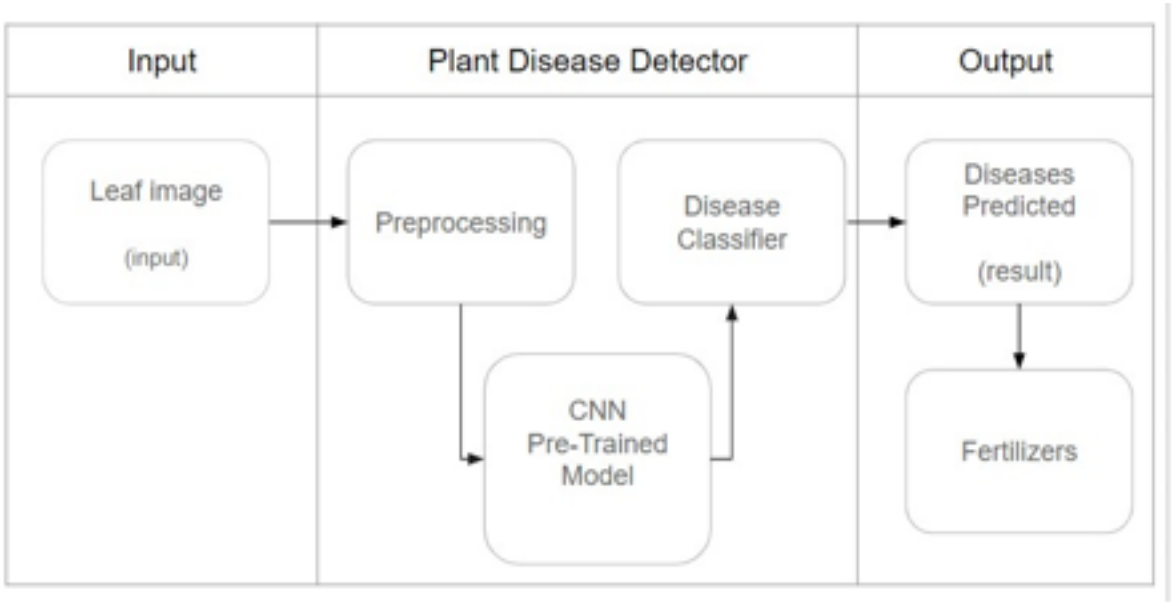

Fig. 1. System Architecture

IMPLEMENTATION

A. Dataset

The diseases in the dataset are classified into various categories.

B. Data Preprocessing

Created up data generators to read photos from our source files, transform them to Float32 tensors, and distribute them to our network. For our test cases, we

have one generator, and for our validation cases, we have another.Batches of 224x224 photos will be generated using our generator. Data entering the neural network should be standardized in some way to make it easier for the neural networks to process. In our situation, we'll preprocess our dataset images by converting the pixel values to the [0,1] range (typically, the pixel values range from 0 to 255)

C. Pre Trained Models

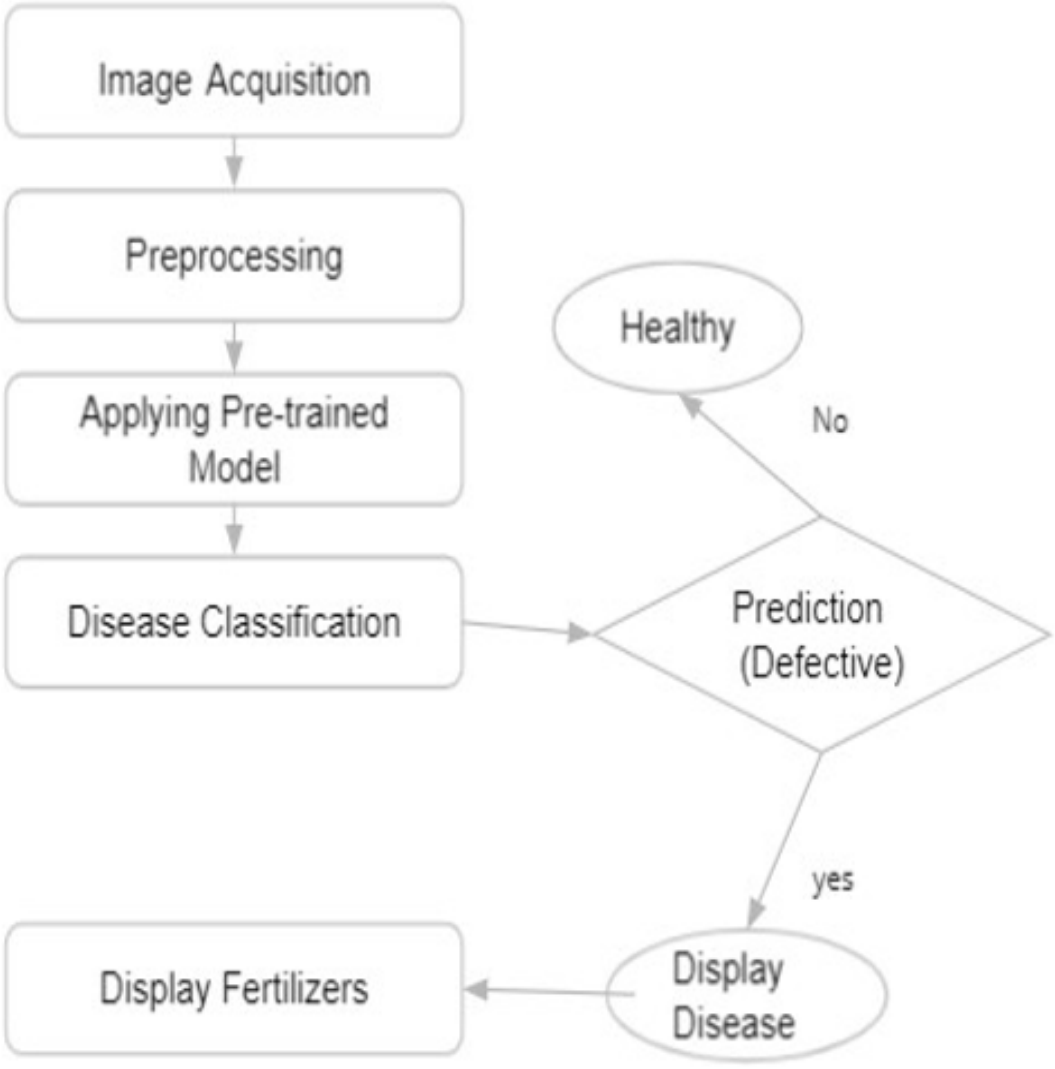

Fig. 2. Flowchart of Training model

Article 3

Soil Based Fertilizer Recommendation System for Crop Disease Prediction System

Dr.P. Pandi Selvi, P. Poornima

ABSTRACT

Agriculture is the main aspect for the economic development of a country. Plant disease, especially on leaves, is one of the major factors that reduce the yield in both quality and quantity of the food crops. Finding the leaf disease is an important role to preserve agriculture. Smart analysis and Comprehensive prediction models in agriculture help the farmer to yield the right crop at the right time. Hence to Detect and recognize the plant diseases and to recommend fertilizer it is necessary to provide symptoms in identifying the disease at its earliest. Hence the authors proposed and implemented new fertilizers Recommendation System for crop disease prediction.

EXISTING METHOD

In most of the existing methods, the process of finding the soil type, identifying the leaf disease and preferring the fertilizer were all carried out manually. The method was prone to various disadvantages. Even when the framework was digitized, it had certain problems such as, predicting a diverse fertilizer for a soil type, certain files regarding the leaf disease or soil type or fertilizer may not be updated. In other situations the system may not provide the needed support. Hence in order to overcome some of these issues, the authors proposed a new approach.

RESULTS AND DISCUSSION

The individual steps involved in the proposed method was organized as follows,

Step 1: Importing the data

The data in this case was linked with the other steps for predicting the content, soil, fertilizer, finance/billing, workflow, etc. Hence, before recording the data, the basic information regarding the soil must be recorded. The user then registers his personal details and the details of the land.

Step 2: Soil Analysis

The soil test report will be analyzed in this step. The nature of the soil, nutrients present in it, will be analyzed. Based on this analysis, fertilizers will be predicted accordingly.

Step 3: Leaf Disease Identification

In this step, the leaf disease present in the corresponding crop will be analyzed and the data will be recorded.

Step 4: Prediction of the fertilizer through comparing and classification
In order to carry out the classification process, the data from the soil report was compared with the data stored in the database using a Long or Short Term Memory algorithm. Finally, the fertilizers are predicted relevant to the soil type.

Article 4

A Recommended System for Crop Disease Detection and Yield Prediction Using Machine Learning Approach

Pooja Akulwar

Agriculture is the mainstay of a rising economy in India. With the advancements in various domains, an intelligent agricultural system is needed for the upliftment of the Indian economy. The collaboration of recommender system with machine learning will lead to Intelligent Agriculture System that helps the farmer community in their decision making of farm management and agribusiness activities such as i) Predicting agriculture commodity market price before cultivation, ii) Determining best cultivars to plant iii) Determine optimum cultivation date v) Evaluate demand and supply risk vi) Investment Prioritizing. It also helps farmers to perform the activities like crop management including applications on yield prediction, disease detection, weed detection, crop quality, and growth prediction etc. This chapter describes the case study on “Crop Disease Detection and Yield prediction”. The study includes identification of crop condition, disease detection, prediction about specific crop and recommendation using machine learning algorithms. It gives an idea about how the recommender system is used in agriculture for disease detection and prediction.

Article 5

CNN based Leaf Disease Identification and Remedy Recommendation System

V Suma, R Amog Shetty, Rishab F Tated, Sanku Rohan, Triveni S Pujar

Agriculture is one field which has a high impact on life and economic status of human beings. Improper management leads to loss in agricultural products. Farmers lack the knowledge of disease and hence they produce less production. Kisan call centers are available but do not offer service 24*7 and sometimes communication fails too fail. Farmers are unable to explain disease properly on call and need to analyze the image of the affected area of disease. Though, images and videos of crops provide better view and agro scientists can provide a better solution to resolve the issues related to healthy crops yet it has not been

informed to farmers.It is required to note that if the productivity of the crop is not healthy, it has high risk of providing good and healthy nutrition. Due to the improvement and development in technology where devices are smart enough to recognize and detect plant diseases. Recognizing illness can prompt faster treatment in order to lessen the negative impacts on harvest.This paper therefore focus upon plant disease detection using image processing approach This work utilizes an open dataset of 5000 pictures of unhealthy and solid plants, where convolution system and semi supervised techniques are used to characterize crop species and detect the sickness status of 4 distinct classes.

Article 6

KRISHI RAKSHAN - A Machine Learning based New Recommendation System to the Farmer

D. N. V. S. L. S. Indira; M. Sobhana; A. H. L. Swaroop; V Phani Kumar

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 fertilizer, 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. Moreover, this article suggests the farmer to increase the crop yield by entering the input values and local soil conditions, wherein the model suggests recommended crop for that soil with an accuracy of 99%

Article 7

Recommendation System for Agriculture Using Machine Learning and Deep Learning

K. SuriyaKrishnaan, L. Charan Kumar & R. Vignesh

In India, the largest source of subsistence is agriculture and its federated sectors. In rural regions, there are about 82% of small and marginal farmers, and 70% of rural households depend primarily on agriculture only. Also agriculture plays a significant role in the Indian economy, thereby contributing 17% of India's GDP. Picking the right crop for the land, cultivating it and obtaining a prosperous yield with the right fertilizer is a great challenge. The proposed system recommends the suitable crops for the lands with varied soil nutrients. The appropriate fertilizers that are suitable for specific soil nutrients and crop sown are also recommended. Plant physiology can be damaged due to fungal, viral or bacterial diseases. Plants affected from the above pathogens are detected. Random forest classifier gives an accuracy of 98% for recommendation system, and PyTorch neural network gives an accuracy of 99.2% for disease prediction.

Article 8

Plant Disease Detection and Crop Recommendation Using CNN and Machine Learning

Raj Kumar, Neha Shukla

The wide-scale prevalence of diseases in crops and inefficient soil to grow crops highly damage the standard quality and quantity of crop production. So, the disease in the crops needs to be diagnosed early by developing or employing a fast and innovative approach and crop recommendation system will benefit the farmers. Hence, this study proposed a system that has the ability to detect diseases in plants using CNN as well as recommend various crops based on the quality of the soil by performing analysis on its various parameters using ML. The dataset for disease prediction training and test is obtained from the Plant Village Dataset and correctly separated and therefore various species of plants are recognized and re-named to make an accurate database. The next step is to obtain a test database that will consist of different diseases in plants that are used to check the accuracy and confidence level of the proposed module. Then the classifier is trained using training data and after that, the output is going to be detected with the best accuracy. And for the crop recommendation system, the Support vector classifier (SVC) algorithm is used as it outperforms compared to other classifiers like KNN, Logistic Regression, Random Forest, and Decision Trees, in the system to improve the efficiency rate of our model. The developed

model also maps the soil and crop database and suggests suitable crops based on the available nutrients level of the soil and thus allows farmers to make better decisions regarding the type of crops that can be sown-in in the field. This study also compared the performance of various classifiers on the available dataset for study and chose the one with the highest accuracy.