Krushimitra Robot

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Abstract- Plant disease detection is the key to preventing losses in agricultural product yield and quantity. Plant disease studies mean the study of visually observed patterns seen on the plant. Health monitoring and identification of disease on plants is very important for sustainable farming. Manual control of plant diseases is very difficult. This needs a tremendous amount of work, plant disease experience, and unnecessary processing time as well. As a consequence, photo processing is used for plant disease detection. Detection of disease includes steps such as collection of images, pre-processing of images, segmentation of images, extraction of features and identification. This paper used photographs of their leaves to explain the techniques used to identify plant diseases. This paper also addressed some algorithm used in plant disease detection for segmentation and extraction of features.

Keywords- Acquisition of objects, segmentation, extraction of features, CNN Algorithm classification.

I. INTRODUCTION

India's entry is an agricultural nation and relies on agriculture for about 70 percent of the population.
Farmers have a wide range of options to pick various suitable crops and find the appropriate plant pesticides. Plant disease contributes to a significant reduction in both agricultural product quality and quantity. Plant disease studies lead to visual studies observable patterns on the plants. Monitoring of Plant health and disease plays a major role in the productive farming of crops. In the early days, plant disease monitoring and analysis was done manually by the expert in the field. This requires a great deal of work and excessive processing time as well.
The techniques of image processing can be used to detect plant disease. Symptoms of infection are seen on the leaves, stem and fruit in most cases. The disease detection crop leaf is called displaying the symptoms of the disease. This paper introduces the image processing technique used for the detection of plant disease.

II. PROPOSED METHOD

The proposed method consists of the following steps:
Step 1: image output.

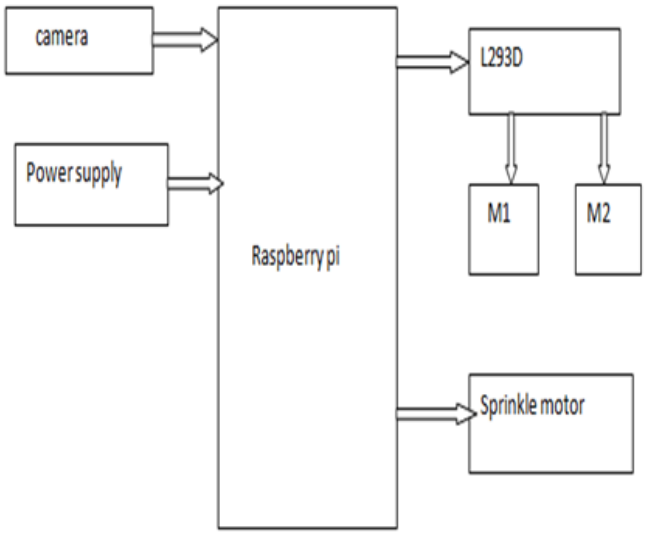
Step2: Image preprocessing which removes the noisy data from the image.

Step3: Segmentation of the image that separates the object into the small segments is performed.

Step4: Remove the characteristics from the object sections.

Step5: Use Deep Learning system, pick the optimal features by optimizing the operation.

Step6: Features learned by the classifier Step7: Find the affected Step8 leaf: reliability evaluation, precision, and recall.



a. ALGORITHM

The algorithms used in the proposed study will follow. The Grey Wolf Optimization is used to customize CNN's functionality.

b. CNN ALGORITHM

Neural Network and Deep Learning The key issue in object identification and pattern recognition is how to find effective apps. Humans have an amazing ability to extract useful features, and many research projects have been conducted over the past several decades to create an FE system as smart as human. Deep learning is a newly developed, artificial intelligence-oriented methodology. Deep methods of learning create a multi-layered network, usually deeper than three layers.

c. KNN ALGORITHM

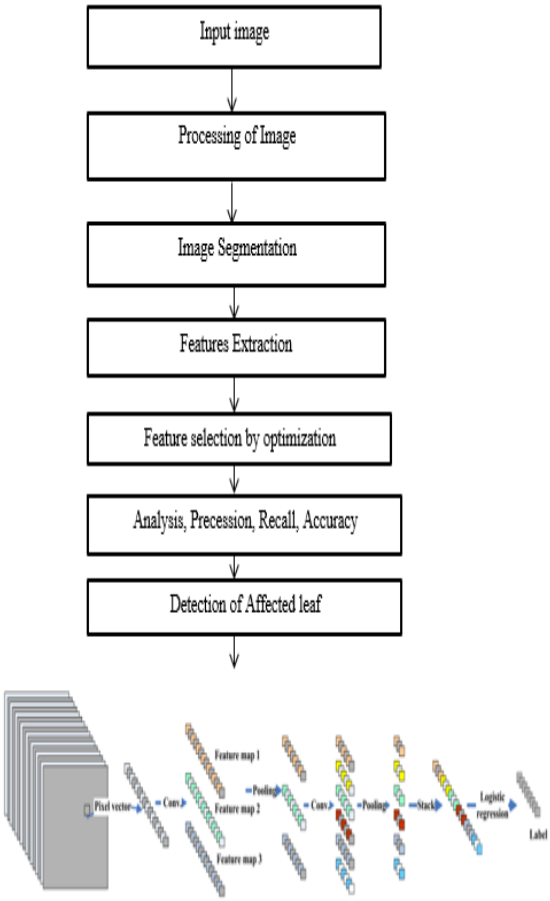
The algorithm KNN
1. Load the number of data
2. Initialize K to your chosen neighborhood number
3. Calculate the distance from the data between the request example and the current example for each instance in the data
3.1. Apply the range and the instance index to the set ordered
4. Order the ordered distance and index set by distances
5 from the smallest to the largest (in ascending order). Choose from the sorted list

6 the first K entries. Get the chosen K entries labels 7. Return the mean of K labels

8 if regression. If marked, return the K tag mode

d. FLOW CHART

The camera is used to capture the image to identify the plant's disease, as shown in the figure above. We can predict the diseases by using image processing. To sprinkle the pesticide, the sprinkler motor is used.



III. IMAGE PROCESSING

A. Image Acquisition

It is the process of creating a visual view or an object's internal structure in a pictorial image. Image restoration can be commonly represented as retrieving an image from some source, usually a hardware-based source that can be processed along with processes that need to appear later. Photo acquisition is consistently the initial condition for the image processing workflow sequence, as processing is only possible with the aid of an image. The picture produced is completely natural and is the product of any hardware used to create it.

B. Feature Extraction

Classification is regulated and not tracked. Training is required in supervised classification where users can select sample pixels to form a category.

Unsupervised classification requires no practice and tests without sample categories are based on code analysis. For the identification of plant disease, classification strategies such as supporting vector machine, neural networks, k-nearest neighbor, fuzzy logic, etc.

Image background

Image segmentation is an important image processing phase where we separate the most needed part of the image. Leaf image segmentation can be challenging if the background contains plants, leaves and some other green elements**.**

Image capture condition

Automatic plant disease detection systems give steady and efficient results, only if all the images are captured under same condition. Capturing images under same condition is possible only inside laboratories. It's a challenge to capture images under same condition in the field because of uncontrollable environment.

Symptom segmentation

Most signs of plant disease do not have well-defined edges and they slowly fade on plants due to which a proper segmentation will not occur, which will affect the final result.

Symptom variations

Symptom depends on seed, disease and climate. Some alteration in these elements can lead to changes in the symptoms. Identifying plant disease with symptom variations is a challenge.

Multiple simultaneous disorders

Many times automated plant disease detection systems may mistakenly assume that extraction of features is the process of deriving from an image a set of values called features that provide image information for further processing. Attributes such as colour, texture, morphological and color coherence vector are widely used in the process of identifying diseases in plants.

1) Color features*:* Color is a basic feature to detect plant change. Most researchers often use the color feature to distinguish plant diseases. There are many methods for extracting color features like color histogram, intersection of histogram, color correlogram, matrix ofcolor co-occurrence, vector of color coherence, etc.

2) Texture features*:* Texture is nothing more than a duplicated information structure or structure arrangement that occurs at uniform intervals. Due to the unique nature of each plant disease, texture characteristics are used to identify and recognize plant diseases.

3)Morphological features: Morphological characteristics apply to an object's shape or form. Since plant and crop diseases come in different ways, morphological characteristics are mostly used for the identification of plant disease. Using these apps, various components of an object can be extracted. Such components are used to remove the boundary that divides different regions in an image, making it easy to recognize plant disease.

[C] Pattern Matching and Classification

It is the technique for examining specified tokens successions for the presence of some pattern elements. The role of matching algorithm is to compare the features of the image present in the database with the index features. Classification is a system in which the observed pattern class is defined. There are only one condition in an object in two major categories. Pests and nutritional deficiencies may occur simultaneously because after infection with some disease, there is a greater likelihood that plants may be affected by other disorders. Different disorders with similar symptoms. Many plant disorders have similar symptoms such as diseases, nutritional deficiencies, pests, phytotoxicity, excessive cold or heat. It's a challenge to differentiate and identify the disorders by automatic plant disease detection techniques.

IV. CONCLUSION

For the effective cultivation of the crop, accurate identification and classification of the plant disease is very important and this can be achieved using image processing. This paper addressed different techniques for segmenting the plant's portion of the disease.

V. REFERENCES

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