

## **A Region Based Crop and Plant Disease Detection Using Content Based Image Retrieval (CBIR)**

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**Abstract :** *This project is based on the concept of "Region-based Crop and Plant disease detection System". It has a social aspect as the resultant project will be used as a utility for the Farmers. Technical aspects include the processing of the image of an object placed in front of camera. Many of the image processing measures will be utilized during the implementation of the project like image capturing, pre-processing, storing in database, comparison from database etc. On a successful match, the Voice processing feature will activate and a word corresponding to the object will be heard. Also the designed system will provide additional information regarding the objects. The project will also utilize the internet facility to retrieve the object information. Implementation on detecting and recognizing an object and its voice display is the main focus of the project.*

**Keywords** -Edge detection, Image processing, CBIR, Color histogram

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### **1. INTRODUCTION**

Plant diseases are turn into dilemma where it can cause of significant reduction of the quality and quantity of the agriculture products. Our research focuses on the detection of plants diseases based on color, edge detection and matching histogram technique. We need two very significance characteristic that is mainly concern with the accuracy of detection and speed to recognize the image diseases. Based on the color space, histogram, and edge detection techniques, we can able to find the disease of plant.

#### **1.1 Problem of Agricultural Plant Disease**

This project is based on the concept of "Region-based Crop and Plant disease detection System". Many of the image processing measures will be utilized during the implementation of the project like image capturing, pre-processing, storing in database, comparison from database etc. On a successful match, Also the designed system will provide additional information regarding the objects. The project will also utilize the internet facility to retrieve the object information. The project is based on the implementation of the detection and recognition of an object. This is method for identify plant disease based on color, edge detection and histogram matching. Farmers are suffering from the problem rising from various types of plant traits/diseases. Sometimes plant's doctors are also unable to recognize the disease that results in lack of identification of right type of disease and this leads to crop spoil if not taken care of at right time. The most significant part of research on plant disease to identify the disease based on CBIR (content based image retrieval) that is mainly concerned with the accurate detection of diseased plant. It has significant perspective in field of agriculture. This research describes effective; sample technique for identify plant disease.

#### **1.2 Overview of Content Based Image Retrieval (CBIR)**

Content based image retrieval (CBIR) offers efficient search and retrieval of images based on their content. With the abundance and increasing number of images in digital libraries and the Internet in the last decades, CBIR has become an active research area. The retrieval may involve the relatively simpler problem of finding images with low level characteristics (e.g. finding images of sunset) or high level concepts (e.g. finding pictures containing bicycles). With the development of the Internet, and the availability of image capturing devices such as digital cameras, image scanners, the size of digital image collection is increasing rapidly. Efficient image searching, browsing and retrieval tools are required by users from various domains, including remote sensing, fashion, crime prevention, publishing, medicine, architecture, etc. For this purpose, many general purpose image retrieval systems have been developed.

#### **1.3 Useful Application of Image Processing for Detecting Disease**

Image processing is the enhancement of image that is processing an image so that the results are more suitable for a particular application. Processing an image means sharpening or de-blurring an out of focus

image, highlighting edges, improving image contrast, or brightening an image, removing noise. The image processing has some useful applications for detecting the various types of plant diseases such as:

- To detect edges of diseased leaf and stem
  - To find shape of affected area
  - To determine color of affected area
  - To separate the layers of image
- For Image segmentation

## 2. PROPOSED APPROACH STEP BY STEP DETAIL

In this system, we are going to detect the diseases of plants, type of soil, fertilizer doses. The type of plant can be determined, how to put crop, then what is the treatment to plant should be given. Online chatting is also provided for expert advice. The weather can be determined for specific crop to put through sensors. Market updates are also provided. Also getting information on various plants and getting appropriate suggestion on diseases of crop plant has become very easy. Many farmers can get the registration easily. This system is very user friendly for farmers and can be easily operated. Many of the difficulties have been removed; also it gives more information about the crops and their diseases. The discussion forum is also introduced in our system. In discussion forum many farmers can discuss about crops, diseases and their remedies. The systems contain all the information regarding different crop plants and display it in the short time. It has two phases.

### 2.1 Step by step detail

Step1: In the initial step of phase-I of disease image detection, the RGB images of healthy and infected plants are picked up. For this purpose, we need two sample one for the healthy image and second for the diseased image. In the healthy image sample we choose a normal or uninfected image of leaf. And on the other hand, we choose infected images of disease.



Fig.1 Healthy Image & Diseased Image

Step2: The second step of detection of plant diseases start with the training process. In the training process, first I separate the layers of RGB image into Red, Green and Blue layers and then apply the CANNY's edge detection technique to detect the edges of layered images. This technique is applied on both the samples such that healthy sample as well as the diseased sample of same plant. The edge detection technique can not apply directly on the RGB image. First, we need to convert it into grayscale image then the CANNY's edge detection technique is applied.

Step3: In the second phase, choose the test sample of plant. When the testing sample is selected, the training process is started again on the testing image.

Step4: In the training process, first I separate the layers of tested image into Red, Green and Blue layers and again apply CANNY's edge detection technique to detect the edges of layer's images

Step5: Once the training process of first phase samples is finished the histogram is generated for both healthy leaf sample and diseased leaf sample and saves in the memory, these histogram are displayed, when we generate the histogram for the testing image. In the second phase, after the training process the histogram for testing sample is created or generated suddenly. Once the histograms are generated for both samples and the testing image, immediately we will applied the comparison technique based on the histogram and edge detection technique. The comparison is firstly with the testing sample and the healthy sample if the testing sample is diseased, it compare testing sample with the diseased sample and these steps take few minute to display the comparison result that is the testing sample is diseased or not. The GUI (graphical user interface) is used to show the overall process. When the comparison is applied the waiting bar is display on our display and results are also shown through the GUI. This is beneficial for us because we are easily understood the processing of implementation phase.

### **3. CONCLUSION**

The proposed system is build with the help of database management system, "MySQL". The computerized systems contain all the information regarding different crop plants and display it in the short time. Also getting information on various plants and getting appropriate suggestion on diseases of crop plant has become very easy. Many farmers can get the registration easily. This system is very user friendly for farmers and can be easily operated. Also it gives more information about the crops and their diseases.

In this research, plant diseased is detected by using histogram matching. The histogram matching is based on the color feature and the edge detection technique. The color features extraction are applied on samples that are contained the healthy leaf of plant and the diseased leaf of the plant. The training process includes the training of these samples by using layers separation technique which separate the layers of RGB image into red, green, and blue layers and edge detection technique which detecting edges of the layered images.

Once the histograms are generated for both samples and the testing image, immediately we applied the comparison technique based on the histogram. The comparison is done with the database image and the input image and this take few minute to display the comparison result that is the input image is diseased or not. The GUI (graphical user interface) is used to show the overall process. When the comparison is applied the waiting bar is display on our display and results are also shown through the GUI. This is beneficial for us because we are easily understood the processing of implementation phase.

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