Pest And Disease Identification in the Plants

Rupam Jogal(1401003),Divya Patel(1401030)
Charmi Kalani(1401067),Himani Patel(1401111)

***Abstract*—The main goal of the project is to detect the disease and make estimation of stage of the disease.For estimation of stage we will be using images of leaves having diesase and not having disease as training data set.Images can be captured by untrained person under uncontrolled conditions. So we need to preprocess the images and do leaf segmentation.First task is to segment leaf from background and second is to detect disease and it's stage.we will detect Grey Mildew which is mostly seen in cotton plant in the field of north Gujrat.**

I. Introduction

Agriculture has become much more than simply a means to feed ever growing population. Agricultural productivity is something on which economy highly depends. This is one of the reasons that disease detection in the plants plays an important role in agricultural field. Nowadays due to use of artificial fertilizers and chemical fertilizers many diseases are seen in plants. If proper care is not taken in this area then it causes serious effects on plants and due to which respective product quality, quantity or productivity is affected. So diagnosing diseases in the plants in an accurate and timely way is of the utmost importance.

Automated detection is important. Calling an expert and asking them for help would consume a lot of time. Also taking pictures of the plant and sending it for testing is time consuming. Thus,we need a solution to the problem of detecting the disease and finding the stage at which it is. Thus this problem has to be taken further and solved.

This project is for the farmers who want to detect the disease in a leaf. As Nowadays due to use of artificial fertilizers and artificial fertilizers many diseases are seen in plants .The leaf displays most disease symptoms with change in colour, texture, and morphology. The diseases which are mostly seen in plants are fungi, bacteria, and viruses. We have taken a cotton plant.

II. Literature Review

Steps for the proposed image recognition and segmentation processes are as follows:-

1) **Image acquisition** is the very first step that requires capturing an image with the help of a digital camera.

2) **Preprocessing** of input image to improve the quality of image and to remove the undesired distortion from the image. So we will take only the leaf part which is clearly visible for detecting the disease and remove the background. For this Clipping of the leaf image is performed to get the interested image region and then image smoothing is done using the smoothing filter. To increase the contrast Image enhancement is also done.
3) We compute a threshold value for the leaf image. if pixel intensity of the green component of leaf is less than the pre-computed threshold value, then zero value is assigned to the red, green and blue components (RGB) of the this pixel. In this way green pixels are masked:
4) In the infected clusters, inside the boundaries, remove the masked cells.
5) Obtain the useful segments to classify the leaf diseases. Segment the components using **genetic algorithm**

   For doing clustering appropriately, the search capability of GAs can be used, to set of unlabeled points in N-dimension into K clusters. On image data, we have applied the same idea in the proposed scheme. We have taken a color image of size m n and every pixel has Red, Green and Blue components. Every chromosome shows a solution, which is a sequence of K cluster centers

   In the first step of fitness computation the dataset of pixel is clustered according to nearest respective cluster centers such that each pixel xi of color image is put into the respective cluster with cluster center zj for j = 1, 2, . . . , K by the following equations
   if$||X_i - Z_j|| \leq ||X_i - Z_l||$

   $i = 1, 2, 3, ..., mxnandl = 1, 2, 3, ..., k$

   Now the fitness function is computed by calculating Euclidean distance between the pixels and their respective cluster by using following equations.

6) Selection of threshold for each pixel based on the range of intensity values in the local neighbourhood is characterized by the mean of the chrominance and luminance channels in the feature set. The feature set is Mean and standard daviations of Red,Blue and Green channels , contrast, correlation, Energy, Homoginity, Entropy, Gradient of the image etc.

III. REFERENCES:-

[1] A. Parikh, M. S. Raval, C. Parmar, and S. Chaudhary, "Disease Detection and Severity Estimation in Cotton Plant from Unconstrained Images," 2016.
[2] V. A. Gulhane, "Diagnosis of Diseases on Cotton Leaves Using Principal Component Analysis Classifier," 2014.
[3] E. Engineering, "Cotton Leaf Disease Identification using Pattern Recognition Techniques," vol. 0, no. c, 2015.