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# Plant Disease Detection and its Treatment using Image Processing

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**ABSTRACT**: India is farming nation, Approx. 20 % of harvest yield is missing universal due to pest attack every year which is valued around Rs. 90,000 million. Saving 5 Rs. is like earning 5 Rs. farmers have been using a pesticide, which in-creases the crop yield to avoid loss. Remains problems in environment due to large use of pesticides harms to soil, sharp toxicity to humans and natural world, change in insect type in agro ecosystems, high cost of control practices etc. Fungus are very known dangerous insects there on grass of plant, send out steamy honeydew, reason loss of leaves and harm the harvest surrender. The visual judgment of farmersis counting of whiteflies has been mostly relied. The illustration decision by farmers for bulk of whiteflies has been less accurate Because of the identification skills has different levels. In laboratory also detection of present whiteflies on leaves, it takes extended time for detection of whiteflies at early on stages has become important because off inimical importance of harvests and strong impacts of damage levels. In proposed solution, using web application, whiteflies on leaves of plant at early stages we are calculating no. of eggs also. farmers to use pesticide as early as possible It will give correct idea . They can avoid damage and control whiteflies, By this technique, farmers are capable of improve 80 % of lost that will cause due to pest occurrence.

**KEYWORDS:** Image Acquisition, Plant Diseases, Pre-processing, Segmentation, Feature Extraction, Support Vector Machine**.**

## I.INTRODUCTION

Major role in economic development of India Agriculture is the largest economic sector . The manual classification and identification methods which are being used to distinguish between different types of leaf diseases that are trusting on human resource. They are subjected to some kind of errors since these techniques are focused by human involvement. Since humans are subjected to tiredness and the automated system also helps to reduce the time consumed by manual techniques. The deficiency of labors, automatic system needs to be incorporated to minimize the work and Many new farming computerization tools are being established by university investigators that pose questions about the effectiveness and effectiveness with which we succeed current farming practices.

The agronomic requirements though in radically different ways to those currently used this has given rise to many new chances to service. So they should be tested via non-destructive techniques Leaves are delicate part of plant, The evaluation of agricultural harvest Classification is dynamic. The most important visual property is leafs texture and colour. Hence, classification of leaf disease is necessary in evaluating agricultural produce, increasing market value and meeting quality standards. Identifying and taking further dealings for further diffusion of the diseases it is also helpful. The process will be too slow, If the identification and categorization is done through physical techniques, we need the experts help sometimes it will be error prone and who are less available. The labours classify based on colour, size etc. if these quality methods are recorded into automatic system by using appropriate program design language then the effort will be error free and faster.

## II.SYSTEM MODEL AND ASSUMPTIONS

The system model includes two parties: the user and the system server. In this module, user are the images of the plant leaf are captured through the camera. After Image Pre-processing ,Image Segmentation ,Feature efficient communication in CR-Networks. The CR technology allows Secondary Users (SUs) to seek and utilize

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Extraction ,classification and treatment the image. he will perform next operations. Here, user upload image then this analysis image and processing image. Then system server is check the User upload image is disease oriented or not disease and its classification and also provide treatment.

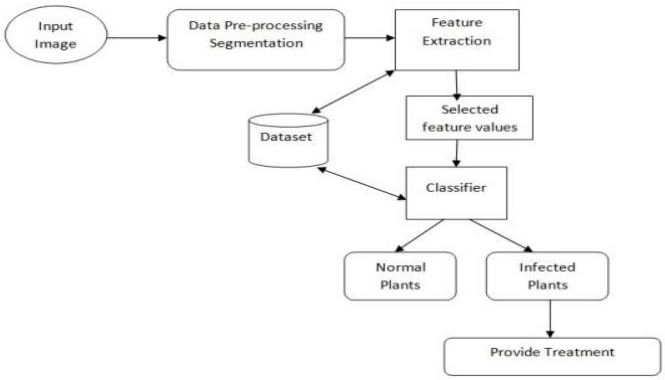


**Fig1:Block Diagram**

### A. Image Acquisition:

In Acquisition Process Diseases images of the plants are capture through the High Resolution camera. This image is in RGB(Red, Green and Blue) form. Color conversion structure for the RGB leaf image is created, and then, a device-independent color space conversion for the color variation manufacture is applied such as HIS model.

### B. Image Pre-processing:

To remove noise in image or other object removal. Image clipping i.e. cropping of the leaf image to get the interested image region. Image smoothing is done using the smoothing filter. Image enhancement is carried out for increasing the Contrast.

### C. Image Segmentation:

Segmentation means partition of image into diverse part of same skin tone or having some likeness dissection means parcelling of picture into different part of same elements or having some likeness. The division should be possible utilizing different Algorithms like otsu' strategy, k-means bunching, varying over RGB picture into HIS model.

### D. Feature Extraction:

The input image is enhanced to protect information of the pretentious pixels before extracting chili folio color from the background. The color space equally is used to reduce effect of illumination and distinguish between disease and non-disease leaf color inventively the resulting color pixels are clustered to acquire groups of colors in the image is shown in Fig. 2.

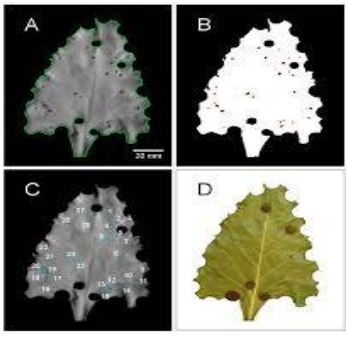


**Fig.2: The Result of color clustering**

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**E. Classification:**
In plant leaf categorization leaf is classified based on its different morphological facial exterior. Some of the classification techniques used are Neural Network, Genetic Algorithm, Support Vector Machine, and Principal Component Analysis, k-Nearest national Classifier. Plant leaf infection classification has wide application in cultivation.

**F. Treatment:**
When the ailment is identify the Treatment will be Provided Using SVM (Support Vector Machine) and arrangement Algorithm, Otsu Threshold Algorithm.

## III. RESULT AND DISCUSSION

In this move toward, the network is qualified on 140 samples from which 6 samples are Phyllosticta, 21 sample be Tar Spot and 86 sample are Linden Leaf Blotch are damaged for guidance and trying.

| Diseases | Recognized Samples | Misclassified Samples | Recognition Rate (%) |
|---|---|---|---|
| Phyllosticta | 6 | 2 | 75 |
| Tar Spot | 21 | 5 | 80.76 |
| Linden Leaf Blotch | 86 | 3 | 96 |

Table1: Recognition rate of the diseases with uniform background.

The under table shows the credit rate From the above conducted examination the table clearly shows that the performance of neural network is not only depending ahead the number features; number of unseen neurons and the loss mistake rate but also depends on the quality of trial picture. therefore an optimization have to be innocent with number of characteristic values, number of concealed neurons and the killing error rate in various dissimilar input conditions in order to properly classify sample to their equivalent module.


**Fig 3:The Result of after Detecting Disease Description.**

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**Fig 3:The Result of after Detecting Disease with Treatment Description.**

The system was tested with image of 800x536 pixels. The total samples are 60 with different plants. The graphical user interface (GUI) result of disease plant is shown in Fig 3. All the plants samples are tested. Table 1 illustrated the samples result of plant disease that was Implemented in this paper. The method implemented in this research paper is effective and fastest method in detection of plants disease. The overall result was satisfying (94.2%) and is considered as a successful project. This paper has introduce a number of technique in image processing for image and color recognition of an image photo. As a conclusion, this research strongly recommends to be use for early detection of plants diseases through leaf inspection. Plants images captured are processed to determine the robustness of each plant.

## IV.CONCLUSION

Thus, is important to correctly diagnose a disease before proffering management options. Diagnosis, being the process of determining the cause of a problem requires the attention of an expert. extract the features of infected leaf and the classification of plant diseases From these methods, we can accurately identify and classify various plant diseases and provide suitable treatment using image processing techniques.

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