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Rose Leaf Disease Detection and Classification Using Image Processing

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ABSTRACT: Image culture research of automatic leaf disease detection an essential research topic as it may prove benefits in monitoring large fields of crops, and thus automatically detects symptoms of the disease as soon as they appear on plant leaves. The term disease is usually used only for the destruction of live plants. This paper provides various methods used to study of leaf disease detection using image processing. The methods studies are for increasing throughput and reduction subjects arising from human experts in detecting the leaf disease. digital image processing is a technique used for enhancement of the image. To improve agricultural products automatic detection of symptoms is beneficial. In this paper the identification of the rose plant diseases is the key for preventing the losses in the yield and quantity of the agricultural product. Diseases decrease the productivity of plant and it also restricts the growth of plant, and both quality and quantity of plant gets reduced. Disease detection on plant is very critical for sustainable Agriculture. It is very hard to monitor the plant diseases done with the hands. It has need of very great amount of work, expert knowledge in the plant diseases, and also have need of the more than enough processing time. Hence, digital image processing is used for the detection of rose plant diseases. Disease detection involves the steps like image acquisition, image pre-processing, image segmentation, feature extraction and its classification. In this study it has been going to explore how save the rose plant from many diseases.

KEYWORDS: RGB Image, Image acquisition, Pre-processing, Feature extraction, Segmentation, neural network., experimental results etc.

I.INTRODUCTION

India is the fast-Developing country and Agricultural is the back bone for the country's development in the early stages. Diseases in plants cause major production and economic losses in Agricultural industry worldwide. Early information on crop health and disease detection can facilitate the control of diseases. The Farmers suffer economic loss due to the increase of leaf disease. The classification and recognition of rose plant diseases is the technical and economic importance in the plant's species. Because Rose is an ornamental plant of choice for home gardening, landscaping & commercial growing. Due to admiration of delightful properties on roses from throughout the world, roses have been classified as the King of flowers. Unfortunately, this plant is prone to infection by several plant pathogens which cause diseases and gradually destroy its health, aesthetic value and marketability. The rose plant is also no exception. It also suffers from a numerous disease that can cause it a stunned and a hampered growth. Huge numbers of disease are seen on leaves of rose plant like chatters, bacterial diseases, viruses etc.It is not possible for farmers to identify the leaf disease manually, so image processing techniques are best to use for the automated detection of leaf diseases that requires less time, money and effort as compared to manual methods.

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II.TECHNIQUES ON IMAGE PROCESSING

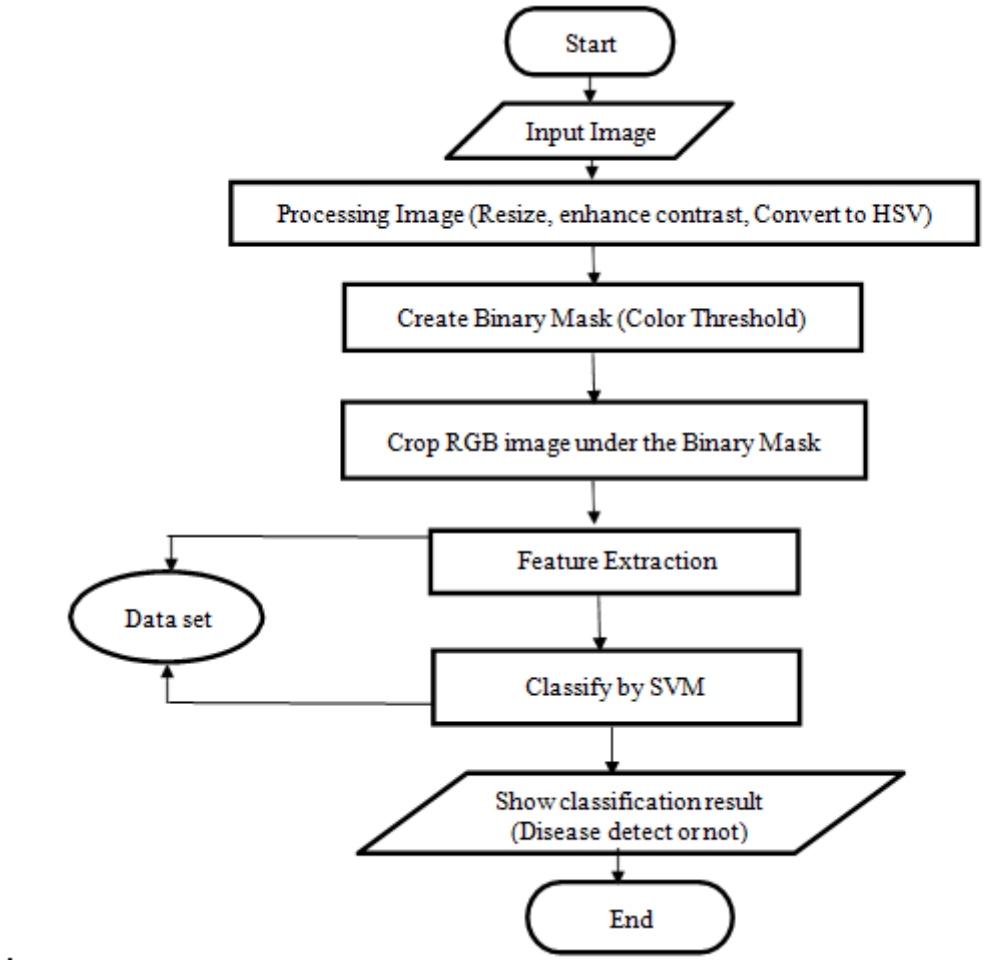

Fig. 1. System Flowchart

Image Processing consists of:

Image Acquisition: In Image acquisition step, images of plant leaves are acquired to perform some operations on image in Image processing system

Image Pre-Processing: The pre-processing techniques are accomplished to make the image applicable for further processing.

Image Segmentation: In Image Segmentation the image is segmented into various part based on the similarity between various features.

Feature Extraction: Feature extraction step retain the various image features that are passed to classifier as its input. is performed and on that suggestions, thresholding is applied. The authors tested two types of threshold first is native entropy

Classification

SVM: For creating database, image is acquired and passed through pre-processing, segmentation, features extraction then disease name is selected for given leaf or fruit and lastly data is stored in database.

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Algorithm:
Step 1: Load leaf image as RGB format

Step 2: Contrast image gives accuracy of
affected image Step 3: pre-processing

Step 4: segmentation of Otsu is considered as binary image from grey image Otsu process: Separate pixels into two clusters

i) Then find the mean of each cluster.

ii) Square the difference between the means.

iii) Multiply the number of pixels in one cluster times the number in the other

Step 5: Feature extraction is identifying the disease and morphological method provide better result Step 6: SVM classify is built in method that can provide classified result.

Image Dataset

Gray scale: In the first place, the picture will be changed over for the gray scale picture.

Filtering: In Image processing there is a variety of filters available to de-noise the digital image such as, Mean Filter, Median Filter, Gaussian Filter

Threshold: The idea is to separate the image into two parts; the background and foreground.

SOFTWARE

- MATLAB −. It is a high-level language for numerical computation, visualization and application development. It also provides an interactive environment for iterative exploration, design and problem solving

- The MATLAB image processing starts with capturing of digital high-resolution images. Healthy and unhealthy images are captured and stored for experiment. Then images are applied for pre-processing for image enhancement. Captured leaf images are segmented using k-means clustering method to form clusters. Features are extracted before applying K-means and SVM algorithm for training and classification. Finally, diseases are recognized by this system.

- The MATLAB software is ideal for digital image processing. K-means clustering and SVM algorithm provides high accuracy and consumes very less time for entire processing.

III.EXPERIMENTS AND ANALYSIS

COLOR CONVERSION:

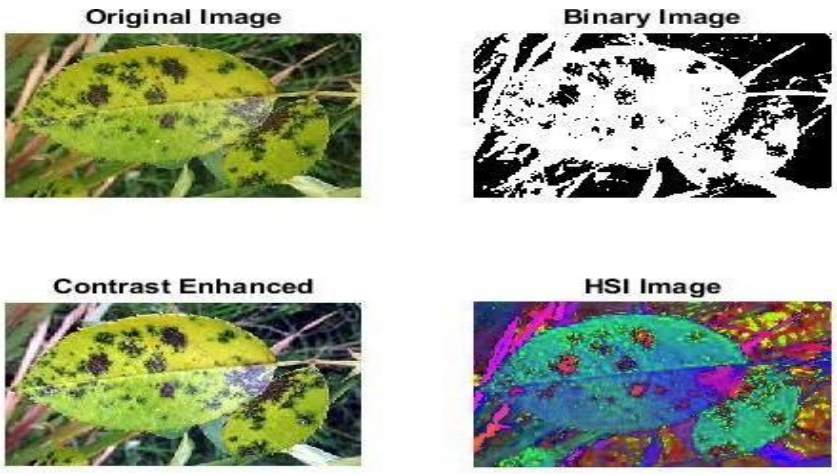

Fig. 2. Color conversion

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Conversion between HSI and RGB.

Any color pixel (R, G, B) is standardized according to r = R/(R+G+B), g = G/(R+G+B) and b = B/(R+G+B) so that+ g + b =1. The HSI chromaticity triangle, for a given intensity, corresponds to a plane through the RGB color cube perpendicular to the line from black to white

CLUSTERING:

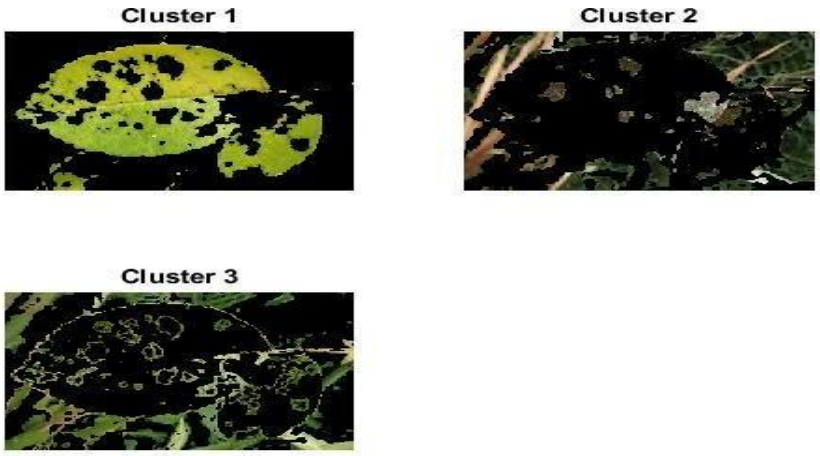

Fig. 3. Clustering

Clustering is important in data analysis and data mining applications. It is the task of grouping a set of objects so that objects in the same group are more similar to each other than to those in other groups (clusters).

IV.EXPERIMENTAL RESULTS

STEP 1:

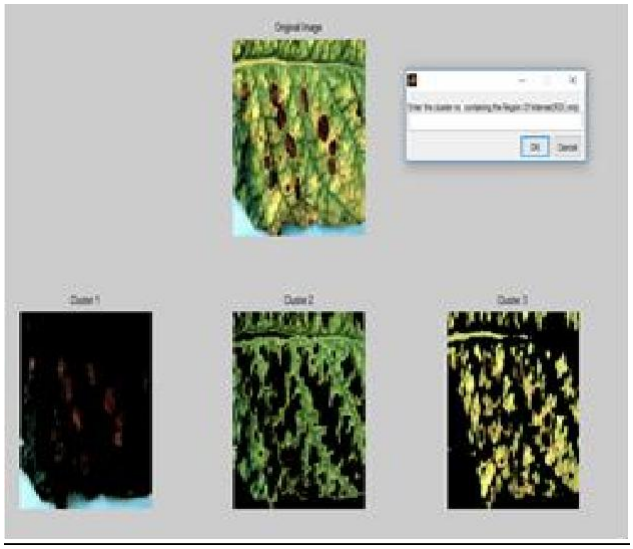

Fig. 4

STEP 2:

Fig. 5

STEP 3:

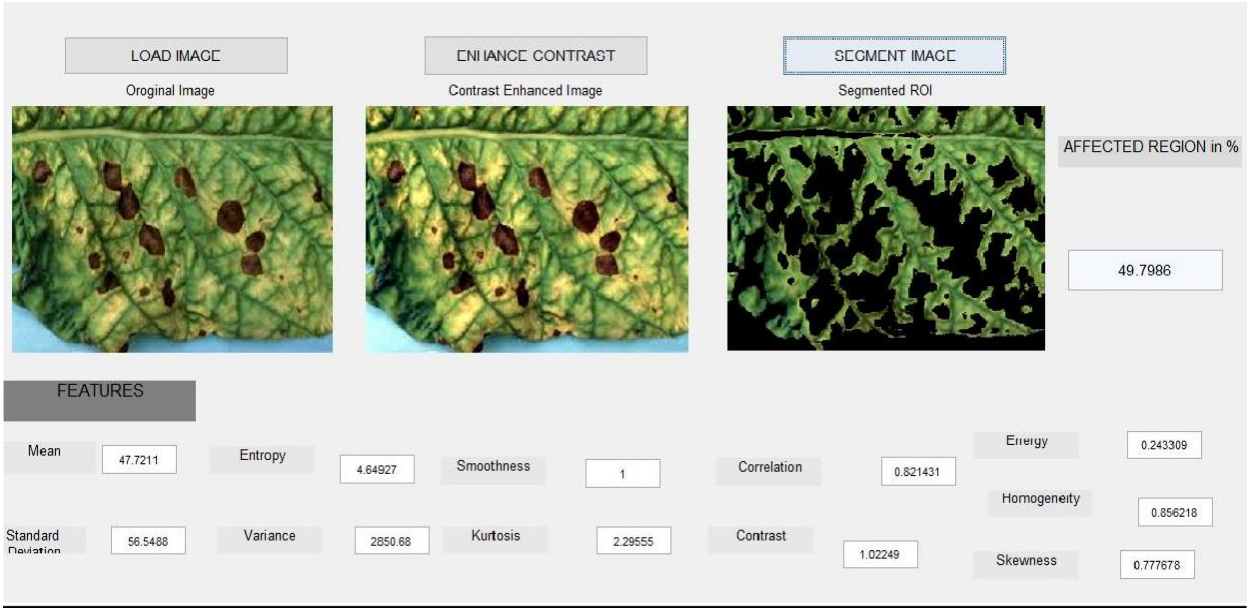

Fig. 6

V.CONCLUSION

We led test utilizing SVM and KNN classifiers a few examples of leaf pictures used to prepare the classifiers and remaining examples are utilized to test the execution of the classifiers, we accomplish sensibly great acknowledgment rate. This paper provides efficient and accurate plant disease detection and classification technique by using MATLAB image processing. The proposed methodology in this paper depends on K-means and Multi SVM techniques which are configured for both leaf & fruit disease detection. The number of diseases in rose is large. To keep its beauty intact, utmost care should be taken. The flower is liked by all and insects & pathogens are also no exception. By carrying out appropriate steps and safety measures the beauty can be easily sealed and made free from the impurities that try to damage it.

The MATLAB software is ideal for digital image processing so K-means clustering and SVM algorithm provides high accuracy and consumes very less time for entire processing. In future work, we will extend our database for more plant disease identification.

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8594-9/10.

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