



Detection of Diseased Section in Leaves Using Image Processing

S.Sadiq Vali^A, R.Ramu^B, C.Surendra^B, S.Sai Tharun^B, S.Iliyaz^B

[1] ASST.PROFESSOR, Sanskriti School of Engineering, Puttaparthi, Andhra Pradesh, India

[2] Department of Electronics and Communication Engineering, Sanskriti School of Engineering, Puttaparthi, Andhra Pradesh

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A B S T R A C T

This project mainly deals and works with the Agricultural help centers and farmers use different techniques to intensify the agriculture production. Farmers experiences great difficulties in controlling various types of diseases. In this project we propose an automatic detection of plant diseases using image processing technique. Image processing is the best approach for detecting and diagnosis the diseases in which initially infected region is found, then different features are extracted such as color, texture and shape. These feature extraction uses different techniques like grey level co-occurrence matrix (GLCM), Gabor filter etc..

Keywords: MATLAB, DEEP LEARNING

1. Introduction

Identification of the plant diseases is the key to preventing the losses in the yield and quantity of the agricultural product. The studies of the plant diseases mean the studies of visually observable patterns seen on the plant. Health monitoring and disease detection on plant is very critical for sustainable agriculture. It is very difficult to monitor the plant diseases manually. It requires tremendous amount of work, expertise in the plant diseases, and also require the excessive processing time. Hence, image processing and Machine learning techniques are used for the detection of plant diseases. Disease detection involves the steps like image acquisition, image pre-processing, image segmentation, feature extraction and classification.

2. Literature Review

1. Yashpal Sen, Chandra Shekar Mithlesh, Dr. Vivek Baghel describes an approach for disease detection of crop for economic growth of rural area. This paper discussed about an automated system for identifying and classifying different diseases of the contaminated plants is an emerging research area in precision agriculture. This paper describes the approach to prevent the crop from heavy loss by careful detection of diseases. The region of interest is leaf because most of the diseases occur in leaf only. Histogram equalization is used to pre-process the input image to increase the contrast in low contrast image, K-mean clustering algorithm which classifies objects. Disease in crop leaf are detected accurately using image processing technique it is used to analyse the disease which will be useful to farmers.

2. **K. Elangoran, S. Nalini** presented a concept of plant disease classification using image segmentation and SVM techniques. This paper describes an image processing technique that identifies the visual symptoms of plant diseases using an analysis of colored images, work of software program that recognizes the color and shape of the leaf image. LABVIEW software was used to capture the image of plant RGB color model and MATLAB software is used to enable a recognition process to determine the plant disease through the leaf images. The color model respectively was used to reduce effect of illumination and distinguish between leaf colors efficiently and the resulting color pixels are clustered to obtain groups of color in.

3. Sandesh Raut, Karthik Ingale proposed fast and accurate method for detection and classification of plant diseases. The proposed algorithm is tested on main five diseases on the plant they are Early Scorch, Cottony mold, Ashen Mold, Late scorch, Tiny Whiteness. Initially the RGB image is acquired then a color transformation structure for the acquired RGB leaf image is created. After that color value in RGB converted to the space specified in the color transformation structure. In the next step, the segmentation is done by using K-means clustering technique after that mostly green pixels are masked. Finally, the feature extracted was recognized through a pre-trained neural network. The result show that the proposed system can successfully detect and classify the diseases with a precision between 83% and 94%.

3. Idea and Methodology:

India is an agricultural country, where most of the population depends on agricultural products. So the cultivation can be improved by technological support. Diseases may cause by pathogen in plant at any environmental condition. In most of the cases diseases. are seen on the leaves of the plants, so the detection of disease plays an important role in successful cultivation of crops. There are lots of techniques to detect the different types of diseases in plants in its early stages. Conventional methods of plant disease detection in naked eye observation methods and it is non-effective for large crops. Using digital image processing and machine learning the disease detection in plant is efficient, less time consuming and accurate. This technique saves time, efforts, labours and use of pesticides. Hope this approach will becomes a little contribution for agriculture fields. In the proposed system at first the images are acquired from the farmer. The images are received from the farmer via the Android Application developed exclusively for the service of the farmer. The images are uploaded by the farmer by choosing the appropriate image of the leaf or the stem preferably from the Choose File option. On uploading a image the farmer receives a ID which has to be used later by him to check the pesticides for the affected disease. The image uploaded by the farmer is processed by the MATLAB. Then image-processing techniques are applied to the acquired images to extract useful features that are necessary for further analysis. After that, several analytical techniques are used to classify the images according to the specific problem at hand. The disease type is detected and displayed by the MATLAB. The affected area is also displayed to identify the severity of the disease.

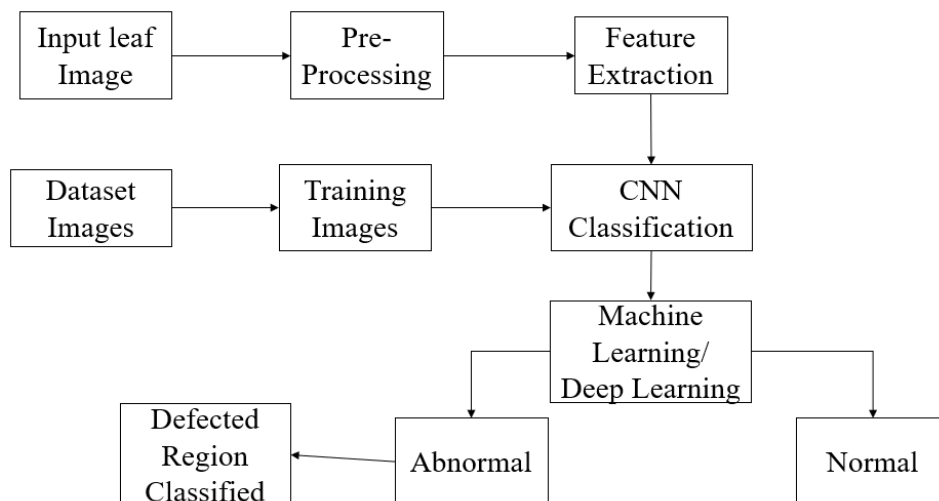
4. Software Used :

MATLAB:

MATLAB was invented by mathematician and computer programme cleve moler. The idea for MATLAB was based on his 1960s PhD thesis. Moler became a math professor at the University of New Mexico and started developing MATLAB for his students as a hobby. He developed MATLAB's initial linear algebra programming in 1967 with his one-time thesis advisor, George Forsythe. This was followed by Fortran code for linear equations in 1971.

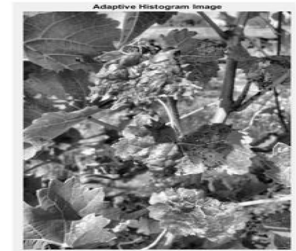
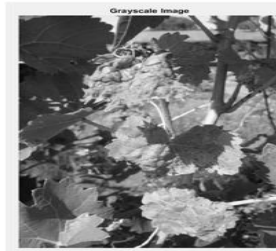
MATLAB is a programming platform designed specifically for engineers and scientists to analyze and design systems and products that transform our world. The heart of MATLAB is the MATLAB language, a matrix-based language allowing the most natural expression of computational mathematics.

OVER ALL DESIGN:



4. Outputs and Results:

Anthracnose Disease



result =

1

The disease detected is Anthracnose, Do not worry farmer, keep the vines off the farm to prevent this disease

Bacterial Disease



result =

2

The disease detected is Bacterial, Do not worry farmer, reduce the pathogen levels by doing crop rotation to prevent this disease

Citrus Canker



result =

3

The disease detected is Citrus Canker, Do not worry farmer, remove the dead limbs well below the infected area to prevent this disease

Powdery Mild Disease

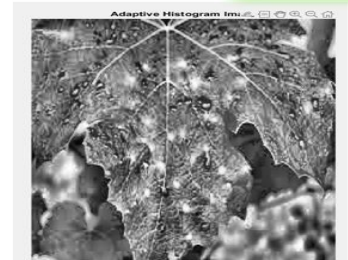
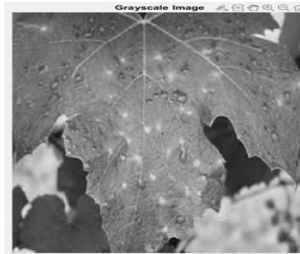


result =

5

The disease detected is powdery mild, Do not worry farmer, prune the plant and remove weeds to prevent this disease

Gray Disease



result =

6

The disease detected is gray mold, DO not worry farmer, use vinegar to kill mold thus prevent the disease

4. Conclusion

In this project, it has been mentioned the leaf diseases problem of grains and vegetables which are harmful aspects for farmers in the agricultural sector. This project has suggested a significant diagnostic approach of Grape plant leaf diseases measures using image processing and CNN. Image processing technique is performed on Kaggle datasets of Grape plant leaves through the operation of data pre-processing, augmentation and data extraction to investigate the symptoms of unhealthy leaf.

Mr.Sadiq Vali, guide of the project has guided us throughout the project in each and every situation.

The team R.RAMU,C.SURENDRA,S.SAI THARUN,S.ILIYAZ(myself) has worked in development of code and various modules.

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