MACHINE LEARNING BASED DISEASE IDENTIFICATION OF RICE PLANT

Ms. A. Ramya, N. Sai Saran, Mrinalini Banik, J.Ram Prudhvi Raju

Assistant Professor , Department of Electronics and Communication Engineering ,SRMIST,

Kattankulathur, Chennai

[1]ECE & SRMIST
[2]ECE &SRMIST
[3]ECE &SRMIST

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Abstract -.The identification and detection of diseases of plants is one of the most points which determines the loss of yield of crop production and agriculture. The studies of diseases are the study of any visible points of a part of the plant which helps us differentiate between the plants, i.e. any spots or color shades. The sustainability of the plant is one among the key points that's for agricultural development. The identification of plant diseases is extremely difficult. In early days, the monitoring and analyzing of plant diseases were done manually by the expertise person in the field. This requires tremendous amount of work and also requires more processing time. The image processing techniques are used in the plant disease detection. In majority of the cases disease symptoms are seen on the leaves, stem and fruit. The leaf plant for the detection of disease is considered which shows the disease symptoms. The Detection of diseases follows the methods of image acquisition, image pre processing, image segmentation, and image classification.

In this paper we'll show the identification of diseases of plants by getting their images of leaves and stems .

Key Words:feature extraction, image pre processing, image segmentation, image classification

I.INTRODUCTION

The problem of efficient disease protection is closely associated with the issues of sustainable agriculture and global climate change In India, Farmers have an excellent diversity of crops. Various pathogens are present within the environment which severely affects the crops and therefore the soil during which the plant is planted, thereby affecting the assembly of crops.Various disease are observed on the crops and plants. The major identification of the affected plantor crop are its leaves. The varied colored spots andpatterns on the leaf are very useful in detecting the disease.

The past scenario for disease detection involved direct eye observation, remembering the actual set of disease as per the climate, season etc. These methods were indeed in accurate and really time consuming. Thepresent methods of disease detection involved various laboratory tests, skilled people, well equipped laboratories etc. So, by using Machine Learning, we will be identifying the diseases which mainly effect the rice plant.

These are not available everywhere especially in remote areas. Identification of disease through some automatic technique is useful because it reduces the work of watching in huge farms of crops, and at terribly early stage itself it detects the symptoms of diseases means after they appear on plant leaves.

So, by using Machine Learning, we will be identifying the diseases i.e. Rice blast, Leaf curl and Anthracnose. which mainly effect the rice plant. We will be justifying the diseases by involving the 11 extraction features.

II. LITERATURE SURVEY

1.Shima Ramesh, Mr. Ramachandra Hebbar, Niveditha M, Pooja R, Prasad Bhat N, Shashank N and Mr. P V Vinod.Plant Disease Detection Using Machine Learning which mainly works on whether the leaf is diseased or healthy, certain steps must be followed. i.e., Preprocessing, Feature extraction, Training of classifier and Classification. Then comes extracting features of a preprocessed image which is done with the help of HOG . [The model could classify with approximate 70 percent accuracy].

2. K. Narsimha Reddy , B.Polaiah , N. Madhu " Plant Leaf Diseases Detection Using Image Processing Techniques.The application of texture statistics for detecting the plant leaf disease has been explained Firstly by color transformation structure RGB is converted into HSV space because HSV is a good color descriptor. Masking and removing of green pixels with pre-computed threshold level. [All the disease cannot be identified using single method.]

3.H. Al-Hiary, S. Bani-Ahmad, M. Reyalat, M. Braik and Z. ALRahamneh "Fast and Accurate Detection and Classification of Plant Diseases "The experimental results demonstrate that the proposed technique is a robust technique for the detection of plant leaves diseases. [proposed approach is a valuable approach, which can significantly support an accurate detection of leaf diseases in a little computational effort.]

4.Jobin Francis, Anto Sahaya Dhas D " PADDY LEAF DISEASE DETECTION USING SVM CLASSIFIER. This shows visual symptoms of a disease. These diseased regions were identified and segmented using k-means segmentation. Color texture features were extracted from each segmented region and used as inputs to a SVM and ANN classifiers.[They can extend this project to classify disease symptoms affected on fruits, vegetables, commercial crops etc.]

5. Vijai Singh, A.K. Misra, Detection of plant leaf diseases using image segmentation and soft computing techniques, information Processing in Agriculture.[To improve recognition rate in classification process Artificial Neural Network, Bayes classifier, Fuzzy Logic and hybrid algorithms can also be used.]

III. Body of Paper

To check whether the plant is diseased or not, certain measures must be followed;

A. Data collection

. In the first step, the sample snap shots are accumulated from the datasets, the usage of one kind digital camera with specific resolutions, which are used to educate the device the sample pictures are stored in the form of the JPG. All the pattern pictures are in RGB (Red, Green, Blue) form. The bought picture encompass the healthy pictures and also diseased pictures. Various methods of preprocessing can be applied to the photo to get better results.

B. Image pre processing

It is any form of signal processing for which the input is an image, the output of image processing can be either an image or a set of characteristics or set of parameters related to the image. Most of the image-processing techniques involve treating the image as a dimensional signal and applying standard signal-processing techniques are done to it. Strategies in this are used to eliminate the historical past noise and also to suppress the undesired distortion which is existing in the photo which occurs due to many reasons such as digital cam settings, variants in the light. To overcome these fundamental problems the input RGB (fig 2) photo is to be transformed into a grayscale image to provide accurate results.
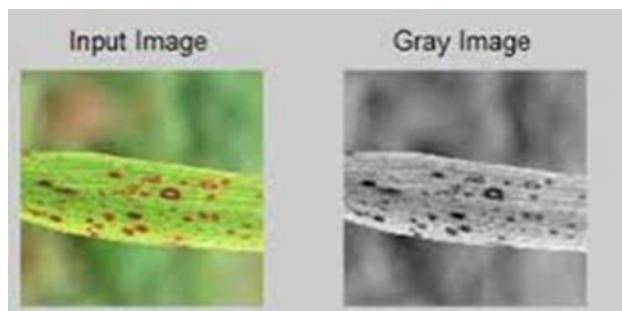

fig.2

C. Image segmentation

Image Segmentation is a technique of partitioning an image into the range of pixels with admire to their depth levels. Assigning a label to every pixel in the image such that pixels with the identical labels will share some characteristics. Masking of the photograph and detect the   path which is used to extend the sharpness of an image.

The threshold is a operation performed with the pixels whose value is greater than the exact threshold value to be assigned within the fashionable value. Edge detection is a primary problem in picture processing and desktop visions. Therefore, the method label edge detection is used in image segmentation. It calculates the gradient of photograph intensities at
each pixel within the image.

D. Image classification

It refers to the labeling of images into one of a number of predefined classes.There are usually *n* number of classes in which a given image can be classified. Manually checking and classification of the images can be a tedious task especially when they are massive in number and therefore it will be very useful if we could automate this entire process using computer vision.

E. Feature extraction

The procedure of extracting the relevant records from the entire photo and transfer the information into a set of elements with their labels is acknowledged as characteristic extraction. In this step, primarily based upon the elements like color, size, shape, texture features are extracted. The features extracted are;
- Mean
- Variance
- Standard deviation
- Skewness
- Co relation
- RMS
- Mean Square Error

BLOCK DIAGRAM
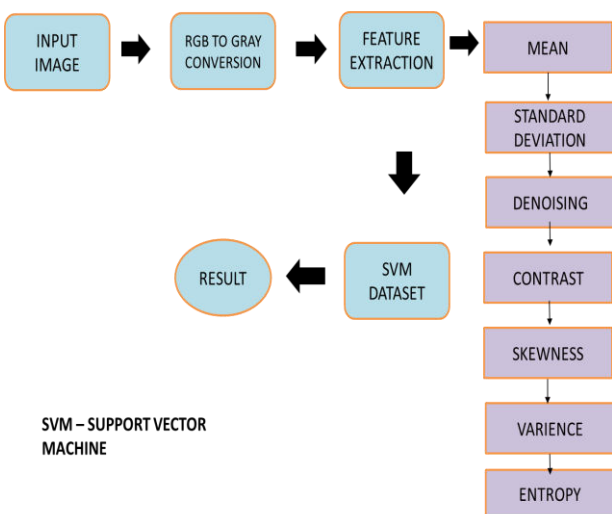
SVM – SUPPORT VECTOR MACHINE

IV. CONCLUSIONS

.. In this paper, to get the accurate result, we have taken SVM classifier and included some of the extraction features for identifying the disease that is infected with rice plant. The methodology has been applied correctly and performance tests on Mat lab software. This rice crop are commonly infected with diseases like rice blast, leaf curl, and anthracnose. Hence, these rice plant disease detection was found by the usage of Machine Learning and the result is send to the customers by the use of Google Cloud Messaging (GCM) through the smart phone. At finally, we conclude that which algorithm works well for which crop based on the accuracy rate.

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V. REFERENCES

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