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PADDY LEAF DISEASE DETECTION USING SVM CLASSIFIER

S.Pavithra[1], A.Priyadharshini[2], V.Praveena[3] and T.Monika[4]

1,2,3,4.Electronics & Communication Engineering,

VSB Engineering College, Karur.

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Abstract

Disease damage to rice can greatly reduce yield, rice assessing the health condition of rice plant through its leaves .In this paper an automated rice leaf disease detection using image processing techniques is proposed here. An image segmentation and feature extraction technique is used for analysis the disease. Paddy blast and brown spot disease mainly analyzed here. Shape and colour features are extracted using SIFT .After the feature extraction SVM classifier analysis the results. (The overall accuracy of the system should improve for 95.00 percentages).

Keywords — Rice Blast, SVM Classifier, Paddy Blast, Brown Spot

I. INTRODUCTION

India is a cultured country and about 70% of the residents depend on agriculture. Farmers have large range of variety for select various suitable crops and finding the suitable pesticide for plant. It can be improved by the aid of technological support. Damage to leaves are mainly from Weather, Chemicals, Mechanical, Nutritional problems and Cultural problems. Pathogens are Fungi, Bacteria, Viruses, Viroids, Phytoplasmas, Nematodes and Insects and mites. Disease on plant leads to the significant reduction in both the quality and quantity of agricultural products. This paper mainly analysis paddy system. This requires tremendous amount of work and also requires excessive processing time. The image processing techniques can be used in the leaf disease recognition In most of the cases disease symptoms are seen on the leaf .The plant leaf for the detection of disease is considered which shows the disease symptoms.

This paper gives the introduction to image giving out technique used for plant disease detection. Image analysis can be applied for the following purposes:

1. To detect diseased leaf,
2. To measure affected area by disease.
3. To find the boundary of the affected area

Disease symptoms and management is challenging task. In this paper, paddy blast and brown spot disease are studied. Blast is caused by the fungus Magnaporthe oryzae. Initial symptoms appear as white to gray-green lesions or spots, with dark green borders. Older lesions on the leaves are elliptical or spindle-shaped and whitish to gray centers with red to brownish border. Some resemble diamond shape, wide in the center and pointed toward either end. Leaf blast lesions are usually elongated and pointed at each end. Management strategies such as use diseased-free seeds, use resistant cultivars, proper plant spacing, transplanting is advisable rather than broad casting, split applications of nitrogenous fertilizer.

II. EXISTING SYSTEM

Disease detection part uses Haar-like feature and AdaBoost (Adaptive Boosting) classifier to locate the disease affected portion of the paddy plant. Disease recognition part uses SIFT. A basic rectangular Haar like component can be characterized as the distinctions of the aggregate of pixels of zones inside the rectangle, which can be at any

position and scale inside of the first picture. This altered list of capabilities is called 2-rectangle highlight. The system can analyze or diagnosis plant leaf disease without maintain any expertise once the system is trained. Grape leaf color segmentation, Grape leaf disease segmentation has been used for analysis the disease in the system. SVM are a set of related supervised learning method used for the process of classification and regression. The detection accuracy is enhanced by SVM classifier. The two class problem is then expanded to multi class problem where the detected leave diseases are then organized into various groups. The plant diseases can be detected at initial stage itself and the pest control techniques can be used to resolve pest problems while minimizing risks to people and the environment by using the SVM classifier technique.

III. LITERATURE SURVEY

The vegetation indices from hyper spectral data have been shown for indirect monitoring of plant diseases. But they cannot distinguish different diseases on crop.

Investigating on Image Processing Techniques for Diagnosing Paddy Disease

A study conducted by Nunik Noviana Kurniawati, Siti Norul Huda Sheikh Abdullah, Salwani Abdullah, Saad Abdullah from Universiti Kebangsaan Malaysia (2012) aims to a prototype system to automatically and correctly detect and classify the paddy diseases with Blast Disease (BD), Brown Spot Disease (BSD), and Narrow Brown Spot Disease (NBSD) using image processing technique as an option or supplemental to the conventional manual method. In this method Disease detection part uses Haar-like feature and AdaBoost (Adaptive Boosting) classifier to locate the disease affected portion of the paddy plant. Disease recognition part uses SIFT. A basic rectangular Haar like component can be characterized as the distinctions of the aggregate of pixels of zones inside the rectangle, which can be at any position and scale inside of the first picture. This altered list of capabilities is called 2-rectangle highlight. The value indicates certain characteristics of a particular area of the image

Grape Leaf Disease Detection from Color Imagery using Hybrid Intelligent System

A. Meunkaewjinda, P. Kumasawat, K. Attakitmong col and A. Srikew on Grape Leaf Disease Detection (2014) from Color Imagery using Hybrid Intelligent System Vegetable and fruits are the most important export agricultural products of Thailand. In direct to obtain more value added produce a product quality control is essentially mandatory This system shows an automatic plant infection analysis using multiple non-natural intelligent techniques. leaf feature inspection mainly used for infection of disease. The system can analyze or diagnosis plant leaf disease without maintain any expertise once the system is trained. Grape leaf color segmentation, Grape leaf disease segmentation has been used for analysis the disease in the system.

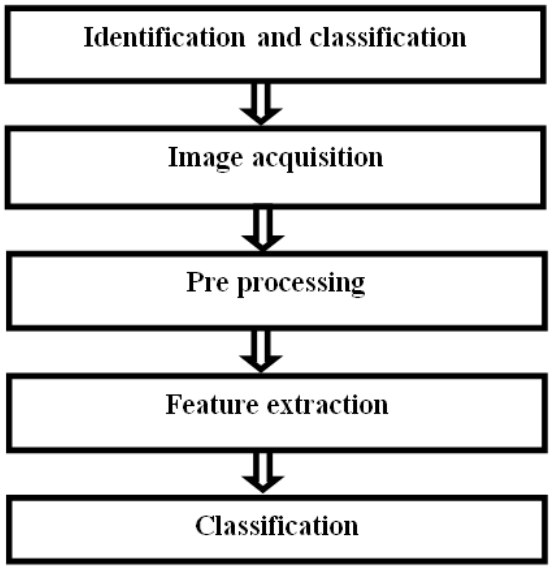
A Framework for Detection and Classification of Plant Leaf and Stem Disease

S. Arivazhagan et al.(2014) has developed four principle steps are first a color transformation structure for the input RGB image is generated, and then the green pixels are marked and eliminated using specific threshold value followed by segmentation process, evaluating the texture features using color co-occurrence technique for the useful segments, finally the extracted features are proceed through the classifier. SVM are a set of related supervised learning method used for the process of classification and regression. The detection accuracy is enhanced by SVM classifier. The two class problem is then

expanded to multi class problem where the detected leave diseases are then organized into various groups. By this technique, the plant diseases can be detected at initial stage itself and the pest control techniques can be used to resolve pest problems while minimizing risks to people and the environment.

IV. METHODOLOGY

The main objective of this process is to improve image data. It consist resizing image and image segmentation. The image resizing operation is required for various purposes such as display, storage and transmission of images. Image segmentation is the process of partitioning a digital image into multiple segments. The goal of segmentation is to simplify and change the representation of an image into something that is more meaningful and easier to analyze. It consist image acquisition, image pre-processing and segmentation, feature extraction and classification.



Flow chart for proposed design

V. FLOWCHART DESCRIPTION

This image is in RGB form. 1. Color transformation structure for the RGB leaf image is created, and then, a device-in dependent color space transformation for the color transformation structure is applied. 2. Image Pre-processing: to remove noise in image or other object removal, different pre-processing techniques is consider. Image clipping i.e. cropping of 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. 3. Image Segmentation: segmentation means partitioning of image into various parts of same features or having some similarity. The segmentation can be done using various methods like Otsu' method, k-means clustering, converting RGB image into HIS model. 4. Feature Extraction: feature extraction plays an important role for identification of an object. In many application of image processing feature extraction is used. Color, texture, morphology, edges etc. is the feature which can be use in plant disease detection. 5. Classification: Using ANN: after feature extraction is done, the learning database images are classified by using neural network. The feature vectors are considered as neural network in ANN . The output of the neural is function of weighted sum of the inputs. The back propagation algorithm modified SOM; Multiclass Support vector machines can be used.

VI. EXPERIMENTAL RESULTS

Image Set

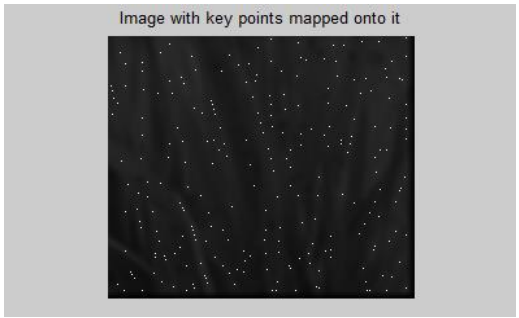
The total number of images trained in the data set paddy at different class. Total number of disease affected images (3 classes) = 120 images Total number of training samples = 90 images (each class contains 30 images) Total number of testing samples = 30 images (each class contains 10 images) The Training Phase, SIFT Oriented Gradient Features Are Extracted To Identify Two

Classes Of Diseases Brown Spot And Leaf Blast Disease Total disease affected images (2 classes)=90 images .Total number of trained images for 2 classes. For testing of images we collected the number of images for analysis the diseases.

Percentage accuracy (%) = Correctly Recognized Image Samples/Total Number of Test Image Samples Correctly Recognized Image Samples *100.

Original Image

Threshold image



Key point matched image

TABLE 1PERFORMANCE OF SVM CLASSIFIERS

Classifier	Average Accuracy	blast	Brow spot
SVM	95.5	30	30
KNN	92.2	30	30

VII. CONCLUSION

The machinery leverage farmers can take up to assess the crop, look at the possibility of diseases at early stages take decision on possible treatment, and the like. The identification of the symptoms affected by paddy disease, by means of a machine vision system may support farmers in proper evaluation of crops. Here we used image samples of images that showed 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. The performance of SVM classifier found to be better than ANN classifier for the work done The work carried out has significance to the real world categorization of crop disease and it involves both image processing and pattern recognition techniques. We can extend this project to classify disease symptoms affected on fruits, vegetables, commercial crops etc

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