

A Review on Rice Plant Leaf Diseases

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Abstract- The rice is most widely cultivated and economical crop in the world. The early detection of disease in the rice plant is more essential. Rice plant is frequently affected with the leaf diseases such as rice bacterial blight, rice blast, rice brown spot, rice sheath rot. Methods such as pattern recognition using software prototype system, automated systems by using support vector machine, image processing using K nearest classifier and minimum distance classifier, data mining techniques have been developed to identify the diseases and provided necessary remedial actions for the respective diseases. In this paper provides the review of detecting the various rice plant diseases.

Index Terms- Software prototype system, support vector machine, K nearest classifier, minimum distance classifier

INTRODUCTION

India is one of the world's largest producers of rice and brown rice, accounting for 20% of all world rice production. Rice is India's pre-eminent crop, and is the staple food of the people of the eastern and southern parts of the country. Rice is life for thousands of millions of people. In Asia alone, more than 2,000 million people obtain 60 to 70 per cent of their calories from rice and its products. India is the second largest producer and consumer of rice in the world after China and accounts for 21 per cent of the world's total rice production. Hence prevention of disease in rice is more important in the forthcoming century.

DISEASE DETECTION TECHNIQUES

PATTERN RECOGNITION TECHNIQUE

Pattern recognition method involves two major processes: first is the feature extraction and the zooming algorithm. In feature extraction method, segmentation of the leaf is done which is followed by the boundary detection and spot detection where the defected part is identified clearly. Zooming algorithm extracts features of the images using simple computationally

effective technique called self-organizing map (SOM).

DETECTION USING IMAGE PROCESSING TECHNIQUES

In this technique, diagnosis of diseased leaves can be done in the following ways: the following steps are followed: Image Enhancement, Image pre-process, Image segmentation, Transformation to Histogram, Paddy Disease Detection. Image enhancement is the process of adjusting digital images. Image pre-processing can significantly increase the reliability of an optical inspection. Several filter operations which intensify or reduce certain image details enable an easier or faster evaluation. The segmentation of image states to represent an image into another meaningful format that is easier to analyze. Color Feature Extraction. The color of the diseased part of the leaf is one of the important indications for detecting the different diseases. The color of the affected part is different for every disease and also varies for different varieties of the rice plant. The color of the diseased part for the same disease is also different. RGB color image converted to a gray scale image by algorithm and it is transferred to histogram and the detection of the leaf sample is taken place. The proposed method is implemented using MATLAB R2012a version, with image processing toolbox and tested on the personal computer with Windows 10 operating system.

DETECTION BASED ON MORPHOLOGICAL CHANGES

In the work, an automated system has been developed to classify the leaf brown spot and the leaf blast diseases of rice plant based on the morphological changes of the plants caused by the diseases. The detection involves the following procedure: Acquire the images of the rice leaf of infected diseased plants from the field. Preprocessing the images to remove noise from the infected portion of the leaf image. For

a diseased leaf, extract the infected portion of the image by segmentation. Compute radial hue distribution vectors of the segmented regions, which are used as feature vectors.

CONTENT BASED PADDY LEAF DISEASE RECOGNITION

An automated system is proposed for diagnosis three common paddy leaf diseases (Brown spot, Leaf blast, and Bacterial blight) and pesticides and/or fertilizers are advised according to the severity of the diseases. K-means clustering technique is used to choose the disease affected segment. To analyze the paddy leaf disease color, texture, and shape features are extracted from the disease affected segment. Supervised learning-based classifier SVM is used to classify diseases. The percentage of affected region is computed and pesticides and/or fertilizers are suggested based on the severity of diseases.

DETECTION OF PADDY LEAF DISEASES THROUGH ARTIFICIAL NEURAL NETWORK

Processing of disease leaves involves three process such as image segmentation, feature extraction and classification. Image segmentation technique is used to detect infected parts of leaf by using K-means clustering. The feature extraction phase derives features based on the paddy leaf image. These features are used as input to the classifier for classification purpose. In this experiment, the classifier is used as artificial neural network. Artificial neural network (ANN) has many applications like clustering, pattern recognition, classification. Back propagation neural network (BPNN) was used to classify diseases. The BPNN classifier consist of three layers: as input layer, hidden layer and output layer. The number of input to neural network is equal to number of texture features. The numbers of hidden layers are 40. The number of output is 3 such as paddy blast, brown spot paddy and normal paddy leaf. Load training and testing data file in Matlab and train the classifier using train files and use test file to perform the classification.

CONCLUSION

Rice has become most important thing in our daily life . early detection and prevention of disease in rice plant is more essential . the paper has provided with

the means of detection various disease in rice plant leaf.

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