

A Survey Disease Detection Mechanism for Cotton Leaf: Training & Precaution Based Approach

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ABSTRACT: The large number of people depends on cotton crop. The recognition of cotton leaf disease are of the major important as they have a cogent and momentous impact on quality and production of cotton. Cotton disease identification is an art and science. The start with collecting the images. We will consider two diseases they are Foliar, and Alternaria of cotton leaves. We have extracted the features and compare those features with the features that are extracted from the input test image they can like grey scaling, thresholding, cropping for detecting the boundary of image. Colour feature like HSV features are extracted from the output of segmentation and (ANN) artificial neural network is trained by choosing the feature value that could distinguish the healthy and disease sample. Experimental result showed that classification performance by ANN taking feature set is better with an accuracy of 80%. The present work proposes a methodology for detecting cotton leaf disease early, using image processing techniques and artificial neural network (ANN). We are also work with the current and future precaution for the cotton tree to protects it from future disease & maintain it to improve its good production as well as life.

KEYWORDS: -Artificial Neural Network, Cotton leaf diseases, Feature extraction, Segmentation.

I. INTRODUCTION

Cotton is an important cash crop in India. Disease on cotton is the main problem that decreases the productivity of the cotton. The main source for the disease is the leaf of the cotton plant. Without knowing about the diseases affected in the plant, the farmers are using excessive pesticides for the plant disease treatment. To overcome this, the detected spot disease in leaf are classified based on disease leaf types using artificial neural network [5], by this approach we can detect the leaf disease. The images required for this work are captured from the fields at Central Institute of Cotton Research Nagpur and other websites. We will take an input image of defected plant leaf and extract the features of leaf. With the help of this feature we will compare our defected plant leaf with data set. We will use Artificial Neural Network as our classifier for comparison of cotton leaf. An (ANN) artificial neural network also call (NN) neural network. We have created a database of cotton.

Leaf disease considering two diseases they are Alter aria, foliar of cotton. We have extracted the separate H, S and V feature and compared those feature with the feature that are extracted from the input test image. I have perform various pre-processing step on the input test image like grey scaling, cropping, thresholding for detecting the boundary of the image. I have compared features with feature of image in the database.

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II. RELATED WORK

The author explained a system in paper for detection of diseases taking into reference various diseases in rice plant. Image growing and segmentation techniques were used to detect disease portions in the plant. In this features of the images were extracted using Zooming algorithm. Self-organize map (SOM) neural network is utilized for classifying of the disease rice leaves. The disadvantage of this technique is that when the image gets zoomed, the output is very blurry sometimes. Also the result can be improved visually as well as quantitatively [3].

The paper defined a work on the identification on Antagonistic Actinomyceters disease in soil. This work is defined to identify the problem analyse the soil components to identify the fungus disease. In this defined to capture the fungus activity analysis so identify the abnormal feature quality so that the disease prediction will be performed under atmospheric conditions and culture conditions with bacterial stain [4]. The author presented a hybrid mechanism to identify the plant disease based on leaf feature analysis. Author considered the various shape and colour adaptive features for wheat plants. Author identify the rust, stripe and leaf based disease feature based disease identification and prediction. Author presented the shape and color feature adaptive model to perform the recognition at the early stage. Author defined the predictive model to perform the early detection of disease. Author used the PCA as the feature and distance adaptation approach and used the neural network as the recognition model to perform disease classification [5].

In the paper defined a work to provide the study on the bacterial impact on various crops and plants with atmospheric condition analysis. Author analyses the excess sludge with wastewater treatment so that the morphological cell properties with colony based optimization will be obtained. Author defined the analysis based on the various chemical vectors and relative component mixture to identify the relative problem [6].

The author proposed automatic system for detection and classification of plant disease. They used K-means clustering technique for segmentation and back propagation algorithm for classification to get the efficiency of 94.67% [7]. The author proposed the maize disease image recognition system for corn. It uses YCbCr color space technology to segment disease spot and use the co-occurrence matrix spatial grey level layer to extract disease spot texture feature and use BP neural network for classification. The accuracy was as high as 98% [8].

2.2. Cotton Leaf Disease:

1. Alternaria:

It appears in form of circular spot and having colour which can vary from circular brown. The disease is more prominent on lower leaves of the plants as compare to the upper part leaves.



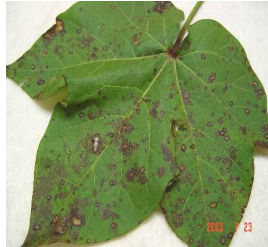
2. Foliar :

Foliar leaf disease such as Fusarium and verticillium with are the main disease to watch for cotton. He leaf spot dark brown to black in colour.

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III. PROPOSED SYSTEM

A. Proposed Architecture:

Fig.1. shows the proposed architecture of experiment which is performed on Matlab. In this fig.1 there are steps that we are going to use for cotton leaves disease detection. Firstly, image acquisition than image processing, image segmentation, feature extraction, and then finally detection and classification of plant disease.

Image Acquisition: the images of the plant leaf are gathering from CICR Nagpur. This image is in RGB form. 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 [6].

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 [9]. Image enhancement is carried out for increasing the contrast.

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 [3]. 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 [3].

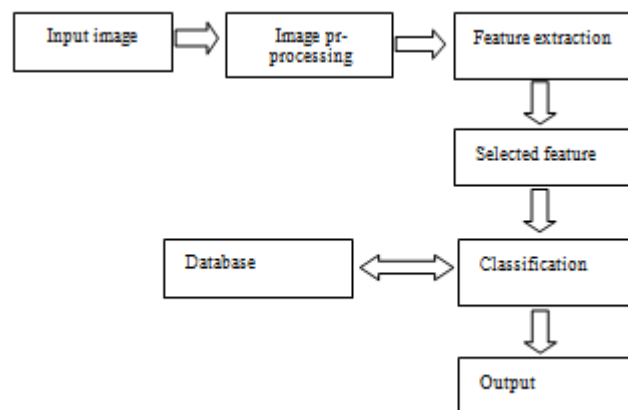


Fig: Proposed Architecture

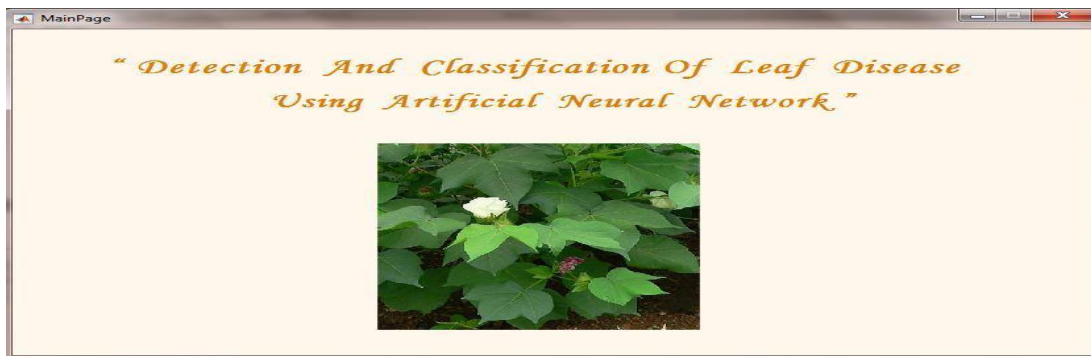
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IV. RESULTS

The Dataset creation is first module of the project in that we collect the images for sites which is suggest by some cotton research center. The following Screenshot shows the front page of cotton leaf disease dictation



Now we will select an image from a dataset then we perform Segmentation on that Image. It is shown in the following Screenshot

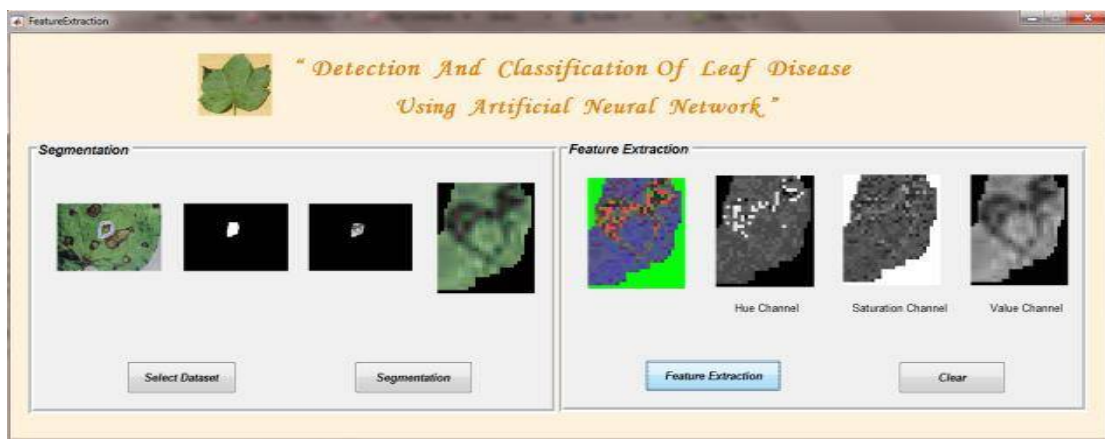
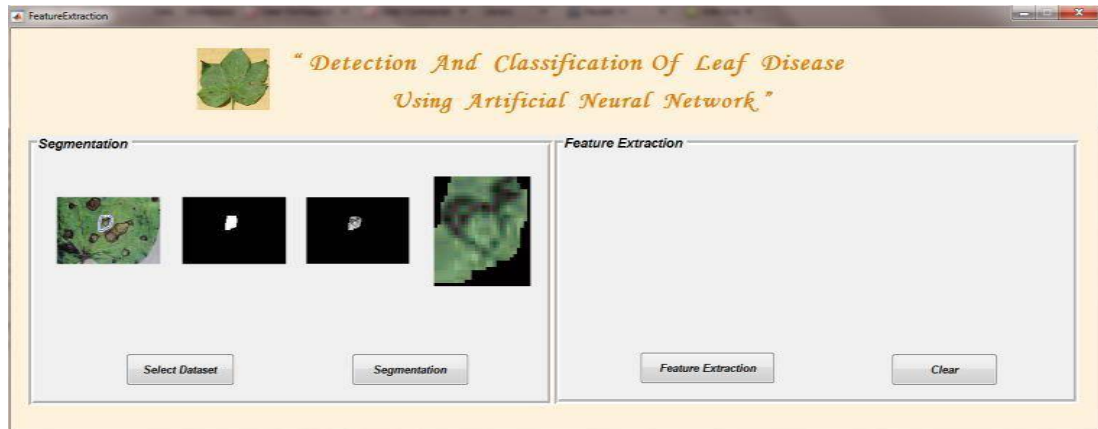


Than next snapshot that show we select the disease spot using freehand and then use active counter for performing segmentation in that first show the segmented image and then converted into binary image. The second binary image is converted into RGB image for the performing next step. And then next step the feature extraction is perform using HSV method in that we separated the H channel, V channel, and S channel. Factor of HSV and binary image is store in our dataset

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V. FUTURE SCOPE

- In future this project can be used for identification of different disease of cotton leaf.
- Same work can be carried out for identification of diseases on other type crops like Orange, Citrus, Wheat, Corn, Maize, etc.

VI. CONCLUSION

Recognizing the disease is the main purpose of the proposed approach which can recognize the leaf diseases with little computational effort. This approach can be used for the agricultural applications like detection & classification of diseases of plant parts like leaf with suitable classifier. This addresses how the disease analysis is possible for the cotton leaf diseases detection, the analysis of the various diseases present on the cotton leaves can be effectively detected in the early stage before it will damage the whole plant. The efficiency of the proposed work is about 80% to 90% and hence the model presented can able to detect the disease more accurately compare to the other classifiers. In this project addresses how the analysis is possible for the cotton leaf disease detection the analysis of Foliar and Alternaria disease present on the cotton leaf.

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BIOGRAPHY

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