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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 grayscaling, 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:*Cotton leaf diseases, Artificial Neural Network, Segmentation, Feature extraction.*

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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 , 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.

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 Alternaria, foliar of cotton. We have extracted the separate H, Sand V feature and compared those feature with the feature that are extracted from the input test image. After that we work for cotton tree precaution according to its features , and also work for its long life by using scientific help.

Hence the Aim and Objectives are:

1. The main aim is to identify disease in cotton leaves; provide strong support for disease forecast and disease control.
2. Our main objective of proposed work is to detect disease in cotton leaves. It is very necessary to detect the disease in cotton leaf.
3. Detection of cotton leaf disease can be done early and accurately using Artificial Neural Network.

II. RELATED WORK

In the [1] author proposed a system for two major grape diseases viz. Downy mildew and Powdery Mildew. The input images are resized to standard size to standard size 300*300 and green pixels are masked. Then the images are enhances by five iteration of Anisotropic Diffusion to preserve the information of affected potion .K-mean clustering is used for segmenting and texture feature are extracted by calculating the gray level co-0ccurrence matrix. Backpropagation neural network is used for classification to obtain training accuracy of 100%.

In the [2] paper proposed the system to identify disease and black spots. The segmentation is performed using thresholding method and the value of threshold is determined using Otsu's algorithm .DCT features and DWT feature are extracted in this experimentation. The use DCT and DWT features with

Support Vector Machine as classifier found to give maximum accuracy of 94.45%.

In the [4] 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.

In the [5] 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 colour 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.

In the [6] paper defined a work to provide the study on the bacterial impact on various crops and plants with atmospheric condition analysis. Author analyzes 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

In the [7] 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%.

In the [8] 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%.

B. 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. FLOWCHART

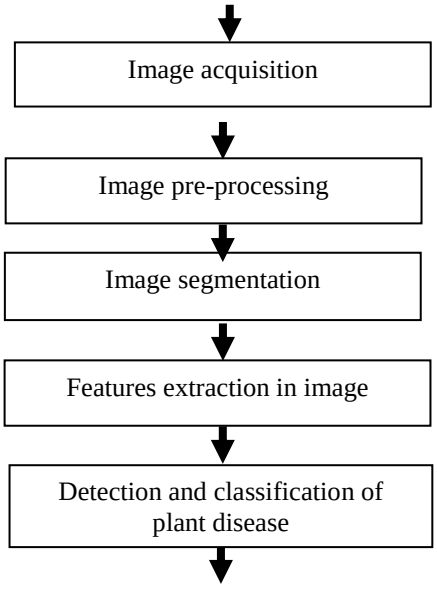

Fig.1: Flowchart of Disease Identification

IV.FLOWCHAT DISCRIPTION

1. 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].

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 [9]. 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].
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].

   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].

V. PROPOSED ALGORITHM

- Back Prapogation Algorithm used .

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