

Cotton Leaf Disease Detection Using Pattern Recognition Technique

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ABSTRACT

The large number of individuals depends on cotton crop. The popularity of cotton disease are of the most important as they have a cogent and momentous impact on quality and production of cotton. Cotton disease identification is an art and science. Now a day's image processing technique becoming a key technique for diagnosing the many features of the crop. This paper mainly focuses detection of varied cotton crop diseases and to classify them. There are classification techniques like k-Nearest classifier, k-means clustering. A sensible phone empowers farmer to stay updated with the going conditions of his agricultural land using IOT at any time and any part of the planet. This identification and detection of disease is possible by using pattern recognition techniques on the different parts of cotton crop. IOT technology can reduce the value and enhance the productivity of traditional farming, not every farmer buy smart phone they mainly focuses on the crops growing, there is a lagging thing in most of the farmers

Keyword: Image Processing, k-means Clustering, Pattern Recognition

1. INTRODUCTION

India is agriculture country where in more than 65% population depends on agriculture. Cotton is very important crop in our country and if some disease are affected on that the economic condition of the farmer gets collapsed. Hence the detection of those diseases are very important. The various cotton leaf diseases are Red spot disease (Lalya), white spot disease (Pandhari Mashi), Crumple leaf disease (Kokoda). SVM and Kmeans algorithm are used to detect the cotton leaf disease. K-means is clustering algorithm used for image segmentation and SVM algorithm is used for the Feature extraction and classification of unseen data. The crop losses due to diseases are approximately 10 to 30%. Farmers judge the diseases by their experience but this is not accurate and proper way. Normally if disease is get detected by the farmer he contacts to the experienced person of that area and get solution for the same but if the detection and identification of disease not correct then it badly effect on the cotton plant. In second case farmer contacts to the owner of pesticide shop who suggests some treatment with respect to his experience. Third case is that farmers are just going with nature they think that the diseases will get cleared automatically in some period of span. The main purpose of this is to identify the type of disease and quantify the damage of cotton crop thereby providing the treatment for the respective disease. After the detection of possible disease on cotton leaf as well as possible treatment, precautions, pesticides suggestion, remedies should be provide to the farmer. Farmer himself can provide cotton leaf to our system and get the details about cotton leaf diseases and treatment.

.As the identification of the problem is not only important part of this research but if we are going to provide solution to the cotton disease will help for all farmer.

2. LITERATURE SURVEY

Cotton is a principal cash crop in India and affects India's economy in many ways. Large number of people depends on Cotton crop either by its cultivation or processing. Automatic detection of plant diseases is an essential research topic as it may be advantageous in monitoring huge fields of crops, and detect the symptoms of diseases as soon as they appear on plant leaves

Khirade et al. ^[1], investigated some division and highlighted the measurement of the extraction which can be used to identify plant diseases by using the image of their leave. The physical identification of plant diseases is difficult due to the requirement of excessive time, plant disease learning and a lot of job calculation. The designer has divided the entire method for the location of plant leaf infections into five stages: image securing, preprocessing, segmentation, extraction of features and final disease arrangement. Picture procurement used the RGB leaf image shift framework.

Rothe et al. ^[2], have suggested pattern identification techniques for the discovery and order of Alter Narnia, Myrothecium, and Bacterial Blight cotton leaf diseases. The images of the dataset are taken from the Central Institute of Cotton Research Nagpur region.

Pawar et al. ^[3], Image processing technique for identification and classification of disease. K-means is clustering algorithm used for image segmentation and SVM algorithm is used for the Feature extraction and classification of unseen data. The crop losses due to diseases are approximately 10 to 30%.

G.Rama Mohan Reddy (2020): CNN algorithm is used for leaf disease detection. CNN means convolutional neural network. CNN is used to train the sample dataset leaves and is used to train the model and used to predict whether the leaf is diseased or not and to show the type of the disease

3. SYSTEM ARCHITECTURE

The proposed system consists of processes like preprocessing, segmentation and analysis, feature extraction and classification of images.

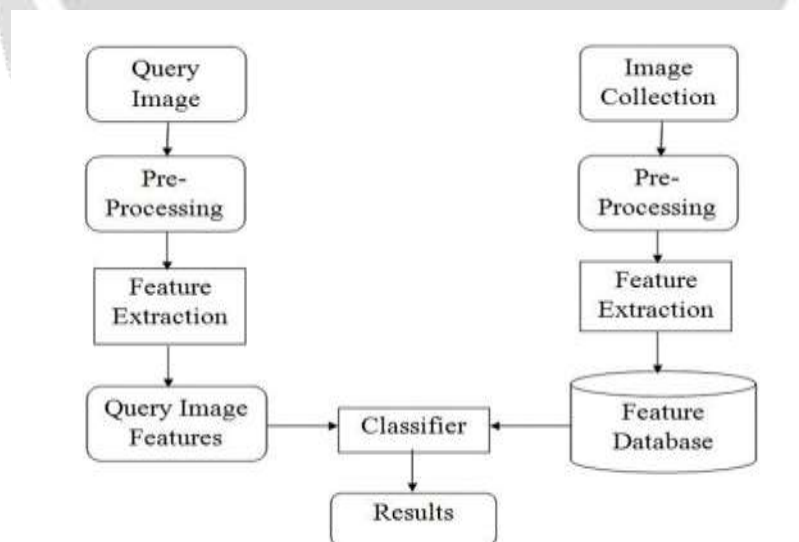


Fig- 1: System Architecture

1.1 Image Acquisition

The images of the plant leaf are gathered 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.

1.2 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.

1.3 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.

1.4 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 used in plant disease detection.

4. CONCLUSIONS

IoT has enables the agriculture crop monitoring easy and efficient to enhance the productivity of the crop and hence profits for the farmer. Wireless sensor network and sensors of different types are used to collect the information of crop conditions and environmental changes and these information is transmitted through network to the farmer/devices that initiates corrective actions. Farmers are connected and aware of the conditions of the agricultural field at anytime and anywhere in the world.

5. REFERENCES

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