Disease Forestalling in oryza sativa using Cloud and Deep Learning

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ABSTRACT :

Oryza sativa became major agriculture crop. Being an addition it is a core food for more than half of the world's population and also rich in nutrient, vitamins and minerals. The quality of this crop is reduced due to various factors such as climatic changes, less nutrients and pathogens like bacteria, virus and fungi. Manual identification for these diseases are time consuming. Time honored image processing, classification and Machine learning techniques have been used for disease diagnosis and analysis. The early signs of the disease can be detected by screening of image, which is an effective method that prevents rice diseases. This work is an attempt of detecting the disease at an earlier stage by automating the process which can prevent the peasants from getting heavy loss. This system is based on image processing and deep learning techniques with the help of cloud. This system helps peasants for crop maintenance from remote location at low cost.

Key words:

Oryza sativa, Image processing, Deep Convolution neural network, Cloud, Disease detection.

1. INTRODUCTION

Agriculture hits a crucial role in our Indian economy. Embryonic for value addition, particularly within the food processing industry. India is expected to envisaged the ambitious goal of doubling farm income by 2022. The agriculture zone in India is expected to generate better momentum in the next few years. Traditionally presence and absence of disease can be predicted manually by experienced people with the help of certain features. By the way to provide a solution to this challenge we are presenting plant disease detection and classification techniques using image processing, deep learning and cloud storage which is used for spontaneous and accurate detection. By automating the process, it will be especially beneficial for peasants and no need of experts advice. To get better yield and to reduce crop failure, various image processing techniques and deep convolutional neural networks is used. In future instead of manual work, Machines integrated with image processing and deep learning will replace it with automation work.

2. RELATED WORK

Different traditional machine learning algorithms have been used for disease diagnosis and analysis. Recently, with the help of image processing and neural network algorithms many researchers have studied plant disease detection and classification. In this existing system, a method to measure and control the various parameters that affect the yield of a rice field was demonstrated. The parameters namely soil moisture, temperature, RH, and water level were uploaded to cloud Raspberry Pi was used as the microprocessor. The cloud could be accessed by the host specific username and password .Incase of any abnormality the farmer is notified via SMS. Deep convolutional neural network is found to be the best in classifying and it acquired a performance as a result of 96% in detecting the plant disease

3. METHODOLOGY

In the proposed system the affected portion of leaf is detected. To

detect the diseased plant techniques like pre-processing, segmentation and classification are proposed and also disease is detected.

A. Extraction of data

Image Acquisition is a process of getting an Input Image form the cloud storage (already the dataset have been stored) for the process of automatic detection of disease in Oryza sativa system using Digital Image Processing. Digital imaging or digital image acquisition is the creation of a digitally encoded representation of the visual characteristics of an object, such as a physical scene or the interior structure of an object.

B. Pre-processing

Image processing is a method to perform some operations on an image, in order to get an enhanced image or to extract some useful information from it. Noise removal and filtering done in this stage. Image resizing is necessary when we need to increase or decrease the total number of pixels, Digital images are prone to various types of noise. Noise is that the results of errors within the image acquisition process that end in pixel values that don't reflect truth intensities of the important scene. The RGB images are converted to gray scale image for easy viewing. Adaptive Histogram Equalization (AHE) is a computer image processing technique used to improve contrast in images. The leaf blade of the image are detected using morphological operation (erosion and dilation).

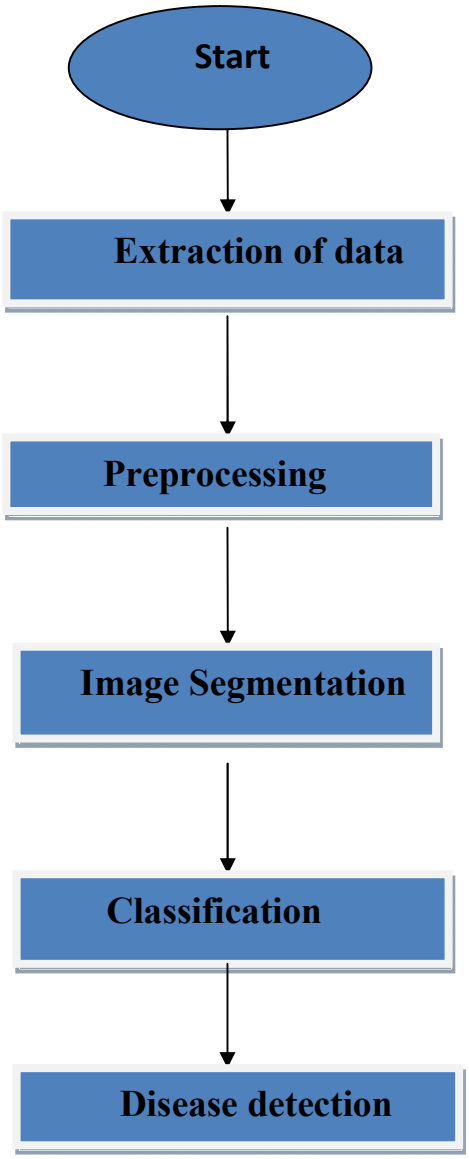
C. Image segmentation

Image segmentation is the process of partitioning a digital image into multiple segments . Several general-purpose algorithms and techniques are developed for image segmentation. As a result, Otsu algorithm attains satisfactory segmentation results when practiced under noisy constraints. Otsu’s method is one among the higher threshold selection methods for real time images with reference to uniformity and shape measures

D. Classification

Classification is the problem of identifying . Features are attributes of the data elements based on which the elements are assigned to various classes. The number of classes, prototype pixels for each class can be identified using prior knowledge. K-nearest neighbor (KNN) algorithm is used for classification with the help of extracted features. Convolutional neural networks are build by deep convolutional neural network and which extracts the macro information about the image. There are convolution layer, pooling layer, activation function and soft max layer in structure. CNN includes optimization stage in that both feed forward and back propagation pass is performed to minimize the error in the training process.

4. FLOW DIAGRAM



5. RESULTS AND DISCUSSION

The main objective of our proposed approach is to enhance agriculture and to implement the modern technology for the betterment of peasants. Usage of cloud makes the remote accessible process .Image processing techniques are faster and cost effective. In addition to that processing of images are more ecological. Deep learning has the ability to execute and identity feature as well as it promotes faster learning. Finally it will accurately predict the status of Oryza sativa by analyzing the condition of healthy and diseased leaf.

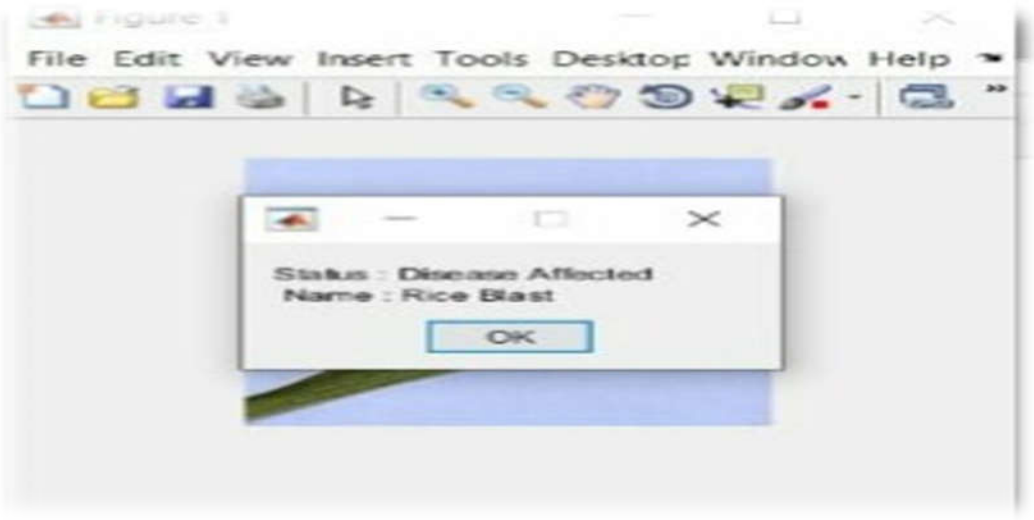


Fig : -Test Picture

6. CONCLUSION

The proposed approach automatically discover the features of leaf disease automatically and it is a conventionally framework to identify the plant leaf disease. This method made easy and economically productive by turning the automating the traditional methods to modern methods of farming . By bringing automation in the field of agriculture by using cloud, image processing and deep learning makes end users to feel satisfaction. By this way the peasants can monitor the crop spontaneously and will get efficient yield. In future, drone will capture images directly from field.

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