

# Detecting Diseases In Crops Using ImageProcessing

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**Abstract:** - The diseases detection in crop is a very important factor to prevent serious losses. Automatic detection of crop is essential research topic. Most crop are infected due to many reasons like fungi, bacteria etc. The Farmers are not much educated. They does not have the knowledge about all type of diseases and the pesticides which are used to prevent the crops from infectious disease, because of that they have to face many losses. To reduce such kind of losses we are going to implement the android application software in which the user should have to take pictures captured by the mobile phones are uploaded in the server and proper solutions are provided to the client or farmer at same instance of time. There are different kind of techniques which we are going to use in this project like edge detection technique, image segmentation, k-clustering techniques etc. Disease detection in crops involve the process like image acquisition, image pre-processing, etc. All the information of diseases with their solutions is stored into the Database which will connected with our android mobile application. The goal of our project is to provide the faster solution to the farmers to reduce the losses which is indirectly related to our Indian economy.

**Keywords**— ‘XML’, ‘Open CV’, ‘Image segmentation’, ‘ image Classification’, ‘ Feature Extraction’.

## I. INTRODUCTION

A Agriculture is an important source for people to survive in today’s economical world. 2/3th part of the India depends on the agriculture for their meal. The changes in environmental conditions such as rain fall, temperature soil fertility the crops can get infected by fungi, bacteria and viruses. The diseases on crops can reduce the growth of the crops and It is also affects the quantity of the crops. The simple way to detect crop diseases is by giving the solution from agricultural expert having knowledge of crop diseases. This is and manual detection of crop diseases and takes lot

of time. So that there is a need for machine leaning technique to identify the diseases in crops. Computer can play important and big role to develop the detection and classification of crop diseases. Different crops bear different Kind of diseases. Automatic detection of crop disease with the help of image processing technique provide more correct result. Manually finding the diseases in crops is less accurate and time consuming. The main disadvantage of this project is that it is can’t able to find the internal diseases of the crops. The image processing techniques will be done on the infectious image of the crops by using the methods like K-means clustering, image segmentation technique, RGB color detection technique, edge detection technique etc. All this process is done into the server database. For the user or farmer the front end is in the form of android application by which the farmer should have to take picture captured by the mobile phone and upload it. After completion of database process on uploaded image the user will get the solutions at the same instance of time. By implementing this time consuming system the farms of the farmers are prevented by the heavy losses.

## II. LITERATURE SURVEY

[1]We designated the previous research has been done on wheat leaf diseases but the implemented architecture is very complex and hyper-parameter of M- bCNN for other challenging Fine-grained classification tasks. It is time consuming model. The author which describes the problem of wheat leaf diseases Zhongqi lin. [2] there is system implemented for the image segmentation by using the techniques of thresholding which is published by author Xinhua cao. The purpose of this techniques are, It is parameter free that is it generate consistent result of image segmentation. The method Otsu is used in this system which is sensitive to class size consideration. [3] However papers that is belongs to the area of image categorization. Fruit diseases recognize can be seen as illustration of Image Processing. Shruti and Nidhi Seth publish the paper on 2-July 2014. Assortment-based techniques point out on split pixels into different classes using different assortment method. [4] Assortment is the most used technique by

researches Shiv Ram Dubey and Anand Singh Jalal published paper on NOV 2013. In which pixels are weigh with a pre-calculated model and classified as defected or healthy. [5] The system based on Detecting Jute Plant Diseases Using Image Processing and Machine Learning author of this is Zarreen Naowal and Faiza Nuzhar they are used this system to deduce stem oriented diseases for jute plants using image processing and machine learning techniques. The system is not useful for identifying the stem and leave diseases of jute plant or any other plants.

### III. FRONT END SYSTEM FLOW

This system will develop in a way that the client does not require much technical knowledge to operate it. The commands are straight forward and will lead the user to the specific solution within less time. This application will have simple captured image of crops and upload that image into the database server. Farmers or users will take image of infected crop using mobile phones and upload it to server by android mobile application. In server, the image will be measure based on visual and textural properties using different image processing algorithms and the system will find the disease name which will be send to the client by mobile application on the client’s end.

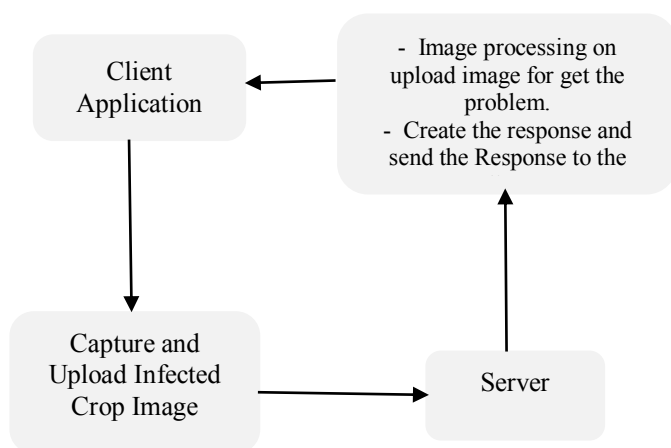


Fig: - application flow diagram

XML programming will used in creating and implementing the functionalities, this application supports all versions of android operating systems. This mobile application will have four big functionalities as given below –

- 1) **Image Capture:** - First of all, after clicking the icon, the application shows a one page having one image view feature and two buttons. One button is for uploading the image to the server and the second button is for downloading the result from the server. The user can also upload the images from gallery.

- 2) **Upload Image to the Server:** - The identification or detect button will be there for uploading the image to server.
- 3) **Download the Result from the Server:-** Once the image processing is finished by applying the various techniques and the disease is detected. The server send back the result as disease name and the solutions regarding to the appropriate disease.
- 4) **Getting Solution:-** After clicking the button, the user will get to solution.xml layout where he or she can see the control or prevention measure by the server.

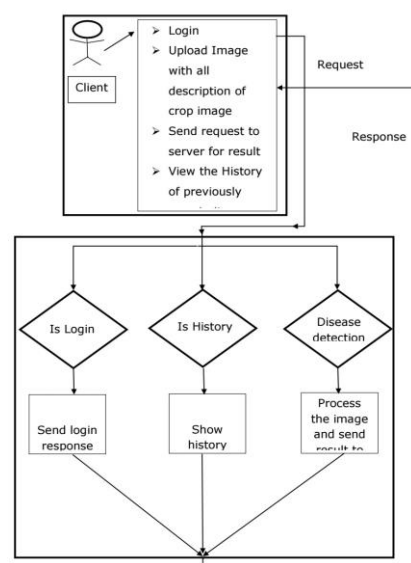


Fig: - client server system architecture

### IV. SERVER SIDE OPERATIONS

We are used Open CV tool for back-end processing of infectious crop. The various techniques are applied on image like Feature extraction, Image segmentation, RGB, Thresholding, Image Pre-processing, etc.

- **Image pre-processing:-** The image will convert to acquiring better result and after that it will forward towards image analysis. Images taken from camera phones contains different factors which alerts the result of the analysis. The image pre-processing is performed by image resizing, image enhancement.
- **Segmentation:-** This technique is used to segment only the affected part of any type of crop image. Segmentation is a process used for the digital image processing techniques.
- **RGB:** - First is RGB technique is apply for colour transformation structure. After that image is divided by K-means assemble technique and

calculate the green pixels value and remove the green pixels and obtain the threshold value of object Otsu's method. The RGB images are sets the zero Value for converting colour co-occurrence technique. The infected clusters was converted into hue saturation value (HSV) after thresholding method.

- **Feature Extraction:-** Feature extraction is the technique used for extracting the result of the infectious images. It is used for texture analysis of the image.
- **K-means clustering:-** It is a easy algorithm which is used for solving assemble problems. It has aims to division a collection of observation into number of clusters (k), resulting in the partitioning of the data into voronoi cells. This algorithm used for dividing the part of image into the different category. This algorithm is very efficient algorithm for image processing.

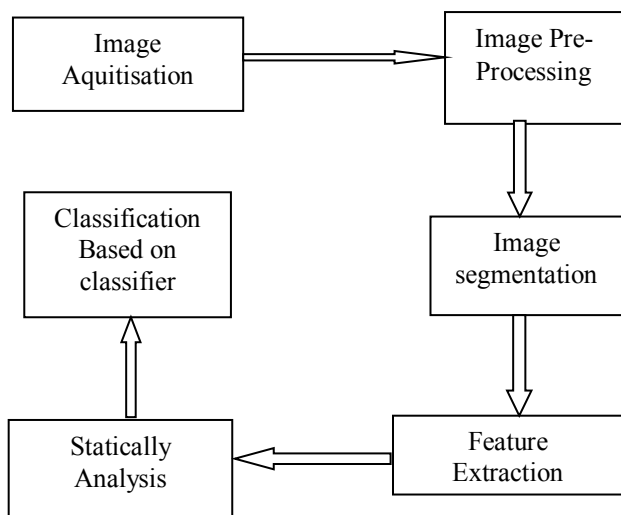


Fig: - algorithm Flow Diagram

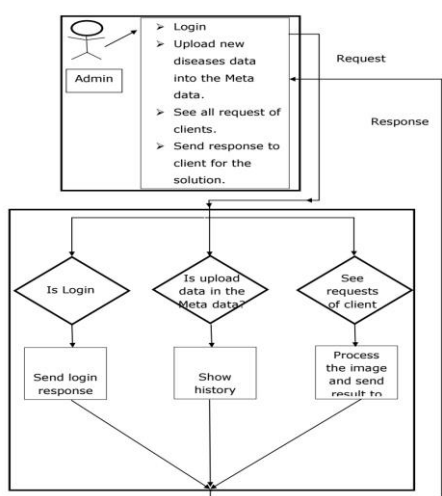


Fig: - Admin server system architecture

**V. CONCLUSION**

Disease Identification is a system which knows the affected portion of crop by using image processing method. This work gives efficient and accurate result of crop disease by using image processing method. K-means and GLCM techniques are used for crop disease detection. This system reduces time of detection of crops disease and labour cost. It can help the farmer to diagnose the disease and take remedial action accordingly. Farmer Will Be Mentally Prepared for the type of loss they will be facing it, in case it's too late for them to opt for the solution.

Queries Related To Agriculture And Disease Are Being Addressed Through These Server. Browsing Of this server Is Possible Through All Part Of The Country. The Solution To The Farmer Query Will Be Immediately Addressed. Sound Agricultural Development. Increase in the Literacy Rate among Farmer

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