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### Agro- escalation android-web architecture

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#### ABSTRACT

The application takes care of certain problems in agriculture and health care by concurrently capturing images, audio and video and sending them to a specified server. Agricultural Scientists or doctors can view or listen to this images/video/audio information and provide proper solutions, accordingly. The Technology used is Content Based Image Processing which matches the histogram of two samples and detect the plant disease at the Server End.

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#### Introduction

Today Farmers not only want two time bread for their Families but also surplus food grains production to sell in the market to gain profits. Plant diseases are turn into dilemma where it can cause of significant reduction of the quality and quantity of the agriculture products. Many new theories and concepts substitute the traditional methods and one of them is to Farmers but these facilities are not present 24/7 and sometimes on call the Farmer is not able to specify the query more precisely. Some other factors like communication failure and network problems also prevent Farmers from consulting the experts. The images and videos captured from Android device can provide a better view to web end to use the Content Based Image Retrieval (CBIR) technique at web end for an optimum solution. This application has a static usage as there is no exchange of information and more serves as the portal rather than as application.

#### Literature Survey

Agriculture is changing social and economic environment. Improper maintenance and disease waste significant amount of agricultural products. Farmers lack the knowledge of correct scientific procedures and hence they produce lesser crops. Kisan call centers are available but do not service 24\*7 and sometimes communication failure. Farmers are not able to explain disease properly on call. Images and videos of crops provide better view and agro scientist can provide a better solution. The experimental results indicate that the proposed approach is a valuable approach, which can significantly support an accurate detection of leaf diseases in a little computational effort. Not involving the advantages of hybrid technique Dedicate the future works on automatically estimating the severity of the detected disease.

#### Proposed Methodology

The methodology gives the identification of medicinal plants based on its edge features. The color image then is converted in to its rescale equivalent image. From this Greyscale image, further the edge histogram can be calculated. The canny edge detection algorithm can be applied for this purpose. Plant diseases cause major production and economic losses in

agriculture and forestry. The bacterial, fungal, and viral infections by insects result in plant diseases and damage. Hence it is necessary to use technology and develop tools for the recognition and use of medicinal plants from their image.

#### System Architecture

The System Architecture of 'Agro Escalation' includes the Web Application (Server), Android based Mobile Application which will be present at Client end i.e. Farmer. The real time assistance ensures flow of information to the remote areas using GPRS or via SMS Mobile Application which can go beyond restricted information flow adding real values to information transferred. Control flow graph shown above shows the flow of control in Agro escalation system. First the authentication of farmer is done, to enter into the system farmer have to login and then system will check for valid user. If the farmer is valid user then he will login to the system and use the services available, if the farmer is a new farmer, he can sign up and then login to the system; else he is an invalid user Secondly, after logging into the system user has to choose his action and decide whether he want weather report As the user of the Android application is concerned the data transmission will take place accordingly. The flow chart depicts information flow of the whole system. As soon as the application starts the user needs to register itself on the application with the necessary details. The information will be send to the server and an account will be created for the specified user both on Android Application as well as the web As the user of the Android application is concerned the data transmission will take place accordingly. The flow chart depicts information flow of the whole system. As soon as the application starts the user needs to register itself on the application with the necessary details. The information will be send to the server and an account will be created for the specified user both on Android Application as well as the Web Application and a Username and Password will be send via a SMS. The Google's Location Based Service (LBS) is used by the Android to automatically detect the user's current physical location and will make it register itself on that service based area. This Android Application also makes the use of the Yahoo Weather Application Programming Interface (API) to

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automatically detect the Weather Conditions around the specified area so that Farmer is aware of climatic conditions and so accordingly be cautious from crop damage due to heavy rainfall or wind or heat.



**Figure 1. Yahoo Weather API**

As soon as the user captures the data through the Application the data will be transferred to the centralized Server of the Web Application. It allows the data to repeatedly capture the data and store it locally on the device even after the images have been sending to Server



**Figure 2 Architecture of Agro Escalation**

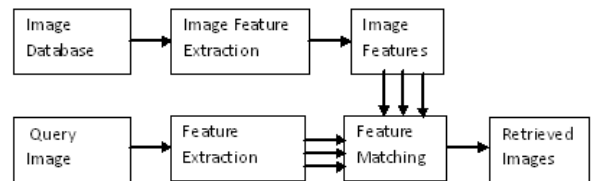
Figure shows the Architecture of Android Application and Web Application. When the users captures the image he gets the variety of choices of settings such as the pixel resolution, flash settings so that if he suffers from a slow internet connection then data can be still send efficiently. Figure 3 shows the system architecture of m-Sahayak for tele-health service. Even today, in many places in India, there is a local health centre but not any physician on 24x7 bases. The paramedical personnel who are normally available in the local health centres can use the developed android based application. The paramedical staff may capture the picture (photo) and send to the server. On the server side, the corresponding expert doctor could then view the patient's Specific zone of the body and give expert guidance to those patients in the remote area.

**Content Based Image Processing**

Content based image retrieval (CBIR) is used at server end and deals with efficient search and retrieval of images based on their content. With the rapid increasing number of images in digital libraries and the Internet in the last decades, CBIR has

become an very active research area. The retrieval may involve the relatively simpler problem of finding images with low level characteristics (e.g. finding images of sunset) or high level concepts (e.g. finding pictures containing bicycles).With the development of the Internet, and the availability of image capturing devices such as digital cameras, image scanners, the size of digital image collection is increasing rapidly.

The recent advancement and development in the internet and multimedia included images and videos in the data. This enabled creation of large image datasets. Hence in current scenario retrieving useful and accurate information from such huge dataset is a hot research topic. One of the fundamental research areas is content based image retrieval. There are two different query categories associated with CBIR .Query by example: In this images are compared based on low level features like colour, shape and texture obtained from the whole image. Instead of image a sketch or a template can be used. Semantic retrieval: It uses description of the search concept. It needs higher level of understanding of contents of the image. It uses local features like Scale Invariant Feature Transform descriptor. The different levels of abstraction of the query can be used in such. There are two different query categories associated with CBIR .Content Based Image Retrieval has efficient search and a retrieval technique of images based on their content. Processing an Image means sharpening or de-blurring an out of focus image, highlighting image or improving image contrast to remove noise. The image processing has some useful applications in the area of the methodology of canny edge detection algorithm is to pick up the images of healthy and infected plants. Then apply the canny edge detection algorithm on samples. Canny edge detection algorithm focuses on preserving the structural properties to be used for further image processing. The main purpose of edge detection in general is to significantly reduce the amount of data in an image.



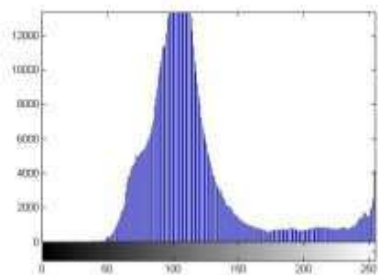
**Figure 2 shows Block Diagram of CBIR Canny edge detection algorithm**



**Figure 3 shows Original Image**



**Figure 4 shows Gray Equivalent**



**Figure 5 shows Histogram**

First comparison is made between the test sample and the healthy sample. If the test sample histogram matched with the healthy leaf sample is generated the result that is plant is not diseased. If it does not match with the healthy leaf sample, the comparison is made between the test sample and the diseased sample. If the test sample is matched with the diseased sample, it generates plant is diseased. First phase includes all the healthy and disease leaves are given as input to the MATLAB. In the training process, the RGB color components are separated into three layers Red, Green and Blue i.e. greyscale image and then apply the CANNY's edge detecting technique. After the edge detection technique histogram is plot for each component of healthy and disease leaf image and stored in the systems. Second phase is mainly concern the test the testing samples that are given as input to the MAT LAB. In the training process of testing leaf , the RGB color components of testing leaf image is separated into red, green and blue components and apply CANNY's edge detection technique on each component. To find the histogram plot for each components and compare all the stored results and identify disease infected or not in the plants leaf

#### **Plant Disease Detection using Basic Image Processing**

In this method an effective image segmentation algorithm has been implemented for colour and texture analysis. The following steps are implemented in the algorithm for plant disease detection

#### **Images for Detection:**

The samples of Malus Domestica both healthy and affected are collected using a Android camera..

#### **Separation of RGB Components**

The format for color images is the RGB. Each matrix corresponds to one segment of the red colour, green color or blue and gives an indication of how much of each of these colors a certain pixel should use. A histogram is a chart that expresses the intensity variations in an indexed or a greyscale image. The information in a histogram can be used to choose appropriate enhancement operation. The process of manipulating intensity values can be done automatically by the histogram digarams. Process that subdivides an image into its constituent parts or objects is called as image segmentation. The Segmentation which has been implemented in this paper is the color and texture based segmentation.

Texture segmentation is the identification of desired markings or spots based on the texture configurations of an image. Texture analysis refers to the characterization of regions in an image by their texture content. Texture analysis attempts to quantify intuitive qualities described by terms such as rough, silky, or bumpy in the context of an image. The algorithm being used for texture analysis is co-occurrence matrix method. The image analysis technique selected for this study was the CCM method. The use of color image features in the visible light spectrum provides additional image characteristic features over the traditional greyscale representation. The CCM methodology

established consists of three major mathematical processes. First, the RGB images of leaves are converted into Hue Saturation Intensity (HSI) color space representation. Once this process is completed, each pixel map is used to generate a color co-occurrence matrix, resulting in three CCM matrices, one for each of the H, S and I pixel maps.

(HSI) space is also a popular color space because it is based on human color perception. Electromagnetic radiation in the range of wavelengths of about 400 to 700 manometers is called visible light because the human visual system is sensitive to this range. Hue is generally related to the wavelength of a light and intensity shows the amplitude of a light. Lastly, saturation is a component that measures the "colourfulness" in HSI space. Color spaces can be transformed from one space to another easily.

Image Analysis Image analysis is concerned with making imitative measurements from an image to produce a description.

During the thresholding process, individual pixels in an image are marked as "object" pixels if their value is greater than some threshold value (assuming an object to be righter than the background) and as "background "pixels otherwise. This convention is known as threshold above. Variants include threshold below, which is opposite of threshold above; threshold inside, where a pixel is labelled "object" if its value is in between two thresholds; threshold outside, which is the opposite of threshold.

#### **Results and Analysis**

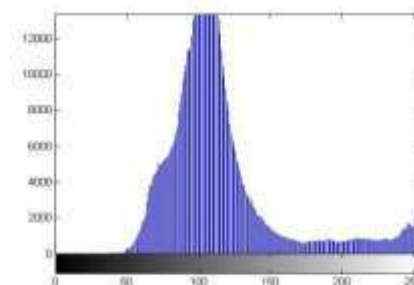
The histogram of the original image is shown in fig-1(c) and fig-1(d) shows the histogram equalized image which is been done for contrast improvement. The texture, color analysis is given in fig-1(e) and fig-1(f) are obtained on Malus Domestica leaves after implementing the above algorithms.



**Figures shows Original Sample**



**Figure shows Greyscale Sample**



**Figure shows Histogram****Figure shows Histogram Equivalent****Figure shows Color Analysis****Conclusion**

The application Agro Escalation would be a boon to Indian farmers as well as common people in the remote areas. Those who are already using an Android phone, can register with their phone number and get an account. The data sent by them will be stored in the corresponding account. The experts may provide their advice to that particular phone number. By this application, the health care units may be able to provide better treatment using limited resources to the Indian common people. Using this application, farmers may control the crop damage and prevent the food problem.

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