Plant Disease Identification System for Android

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Abstract— Images form important data and information in biological sciences. Plant diseases have turned into a dilemma as it can cause significant reduction in both quality and quantity of agricultural products. Automatic detection of plant diseases is an essential research topic as it may prove benefits in monitoring large fields of crops, and thus automatically detect the symptoms of diseases as soon as they appear on plant leaves. The proposed system is a software solution for automatic detection and computation of texture statistics for plant leaf diseases. The developed processing scheme consists of four main steps, first a colour transformation structure for the input RGB image is created, then the green pixels are masked and removed using specific threshold value, then the image is segmented and the useful segments are extracted, finally the texture statistics is computed. From the texture statistics, the presence of diseases on the plant leaf is evaluated. Experimental results on a database of about 500 plant leaves of 30 different plants confirm the robustness of the proposed approach.

Keywords— "Image processing", "Android", "Color Co-occurrence Matrix", "Texture", "Plant Leaf Diseases"

I. INTRODUCTION

India is an agricultural country and the position of any country in the world depends on its economy and the economy of most of the countries depends on agricultural production. In India the farmers have wide diversity to select their crop for cultivation to produce maximum yield depending on environment available. Then also the production get affected by diseases of the crop. The diseases of the crop are caused by pathogens, deficiency of nutrients, fungi etc. Detecting diseases at early stages enables to overcome it and treat it appropriately. This process requires an expert to identify the disease, describe the method of treatment and protection. Identifying the plant disease is not easy task. It requires experience and knowledge of plants and their diseases. It also requires accuracy in describing the symptoms of plant diseases. A person can depend on a system which has experience and knowledge, called an Expert System.

An expert system can be:
- Agricultural advisor

- An excellent farmers

- Electronic or Computerized expert system

An excellent farmers precisely catch the change of the crops in the growing process and they manage the cultivation in proportion to the change in order to cultivate the agricultural products of high quality. Since sensing the delicate change of crops is acquired through the observation by the visual sense in their long cultivation experience, it is difficult for them to transmit the understood technique to future generations as a general cultivation one. If farmers decide to take advice from agricultural expert regarding the treatment of incidence of pest /disease/trait to their crop/plant in order to increase the crop productivity then he may face following situations:
- Sometimes they have to go long distances for approaching the expert.

- Even though they go such distances expert may not be available at that time.

- Sometimes, the expert whom a farmer contacts, may not be in a position to advise the farmer with the available information

  and knowledge.

In these cases seeking the expert advice is very expensive and time consuming. Electronic expert systems enables farmers in identifying type of diseases; making the right decision and selecting the proper treatment. The expert systems are intelligent computer programs that are capable of offering solutions or advices related to specific problems in given domain, both in a way and at a level comparable to that of human expert in a field. One of the advantages of using Electronic expert systems is its ability to reduce the information that human users need to process, reduce personnel costs and increase throughput. Another advantage of expert system is that it performs tasks more consistently than human experts. The electronic expert systems can be thought of as Content Based Image Retrieval (CBIR) Systems. CBIR systems are computer vision applications where the desired images are retrieved from large collection of the images on the basis of the features that can be automatically extracted from the images themselves. CBIR involves two steps:

Feature Extraction: Extracting image features to a distinguishable level

Matching: Matching these feature to produce a result that is visually similar to the query image.

II. EXISTING SYSTEM

Images form important data and information in biological sciences. Plant diseases have turned into a dilemma as it can cause significant reduction in both quality and quantity of agricultural products. Automatic detection of plant diseases is an essential research topic as it may prove benefits in monitoring large fields of crops, and thus automatically detect the symptoms of diseases as soon as they appear on plant leaves. The proposed system is a software solution for automatic detection and computation of texture statistics for plant leaf diseases. The developed processing scheme consists of four main steps, first a colour transformation structure for the input RGB image is created, then the green pixels are masked and removed using specific threshold value, then the image is segmented and the useful segments are extracted, finally the texture statistics is computed. From the texture statistics, the presence of diseases on the plant leaf is evaluated.

III. PROPOSED SYSTEM

Therefore looking for fast, less expensive and accurate method to automatically detect the diseases from the symptoms that appear on the plant leaf is of great realistic significance. This enables machine vision that is to provide image based automatic inspection, process control. The objective of this paper is to concentrate on the plant leaf disease detection for android based on the texture of the leaf.
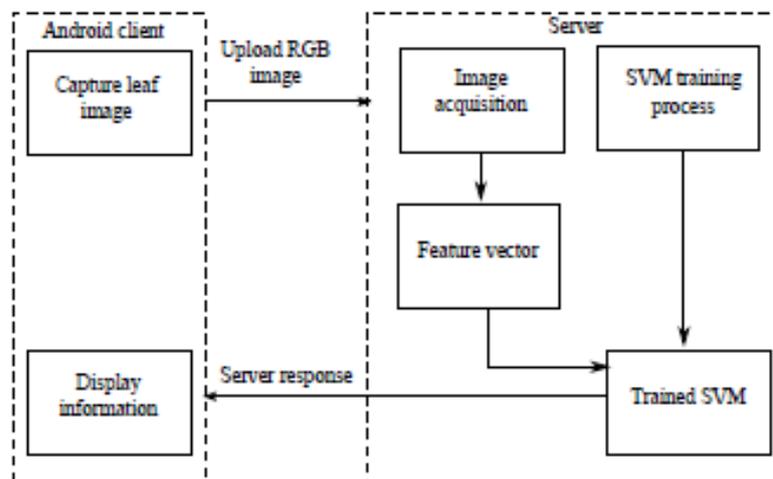

Fig. 1 System Architecture

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IV. CONCLUSIONS

From the analysis, grayscale images are easy to process and implement. They have better clarity and suited for analysis than RGB images. Histogram equalization is used to enhance the contrast of the images and provides clear image to human eyes. So, these types of images will be used to analyse and diagnosis the plant leaves diseases and determines the diseases level of the plant leaves. Mobile phone has become available at the grass-root level providing different social and economic benefit. The aim of this proposal was to develop a user friendly automated system for the farmers that will help them in determining detection diseases of leaves without bringing an expert to the field.

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