

Application for Detection of Plant Disease

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Abstract - In this project our aim is to detect plants disease using android app which is implemented using image processing. We are creating an web app through which we will capture image and send it to database for analysis and verification. The captured image will again go through the image processing steps and will be compared with the haarcascade created using the dataset of images. If the images are matched then it will send the results to the user.

Key Words: image processing, android, plant disease, python

1. INTRODUCTION

Plants are an important part of our life and thus preserving them and protecting them from things that might cause damage should be prevented. Plants are a source of living for the humans as well as animals. Plants have been sufficing the daily needs of millions of living beings and thus the safety of people as well the plants lie in our hands.

Farmers have been facing a lot of problems and damages in the recent years due to crop diseases. And the damages have cost them their lives. Unawareness about the disease makes it difficult for the farmers to protect their crops and take measures to ensure their safety. After recognizing the patterns and spots on the surface, treating them right is also an important measure.

Reaching for the experts is the only solution left to the farmers. But reaching them on time, looking for them and consulting them again and again after travelling long distances might prove to be expensive. So, creating software equipment for detection of diseases would help them in preventing them and thus lowering the damage at early stages [1].

Each year, plant viruses and fungal attacks lead to crop losses of up to 30 percent. That is why it is important to detect plant

disease early on. Yet laboratory tests are expensive and often time-consuming. Researchers are now developing a low-cost quick test for use on site. Identification of the plant diseases is the key to preventing the losses in the yield and quantity of the agricultural product. The studies of the plant diseases mean the studies of visually observable patterns seen on the plant. Health monitoring and disease detection on plant is very critical for sustainable agriculture. It is very difficult to monitor the plant diseases manually. It requires tremendous amount of work, expertise in the plant diseases, and also require the excessive processing time. Hence, image

processing is used for the detection of plant diseases. Disease detection involves the steps like image acquisition, image pre-processing, image segmentation, feature extraction and classification.

In this project, we specify the development of an android application that will help the farmers as well as people to detect the plant disease by using this application. The user or the farmer has to capture an image of the diseased leaf from his/her android application. This diseased leaf image from the application will be sent to a database server for further processing. Image feature extraction will be carried out to extract the important features from the diseased leaf and the results of this process will be rendered on the android device.

An android application will prove to be a cheap solution for their plant detection requirements and it will help them keep the plants healthy and safe ensuring the health of both plants as well as people [2].

2. EXISTING SYSTEMS

Plant disease detection has become an important topic to ensure health of the plants and taking necessary measures to prevent it from getting deteriorated and causing heavy losses to the farmers. There should be solutions for detecting and classifying the diseases to get some knowledge which will later help in improving the quality of plants. So, patterns on the plant's leaves will help in identifying what problem it has[3].

Various techniques of image processing and pattern recognition have been developed for detection of diseases occurring on plant leaves, stems, lesion etc. by the researchers. The earlier a disease appears on the leaf, the earlier it should be detected, identified and corresponding measures should be taken to avoid loss. Hence a fast, accurate and less expensive system should be developed.

3. PROPOSED SYSTEM

Here, in this project, we are going to build an android application to detect the diseases in plants. Initially, we need to click a picture of a diseased leaf from an android device. Then the captured image will be passed on to a database server for further analysis and feature extraction. The server will receive a picture on which it will perform the steps of image processing to extract the important features of the diseased leaf. Initially, we will create a database of negative images i.e. the ones that aren't affected and we will take an image having the object i.e. the diseased image and this diseased image will be bombarded on the several hundred

negative images stored in the database and this set of positive images will be stored separately in the database. The bombarded images will be trained and the threshold values will be stored in the database in the form of a file. An xml file of this threshold values is generated. This threshold values will be compared with the threshold value of the input image. When an image is captured through an android device, that image will be called as an original image which will have some noise. So, noise reduction will be performed on the image. After noise removal, the RGB image will be converted to grayscale for further processing. For the detection process, a rectangular shaped box is made by locating the coordinates which is of the size 20x20 which is sufficient for detection because an positive image of size greater than this will take more time to run. Parameters like height, width are assigned and the program turn by turn as per the assigned coordinates scans the entire input image for the presence of the positive image. If it gets the range of threshold values which it got by the training data for the input image then it based on the threshold values it determines whether the plant is affected by a disease or not an if it is affected then it determines whether it has a bacterial or a fungal disease. This system has been developed in python and a Django database is used for storing the images.

Disease detection involves the steps like

[1] Image acquisition

In this step, the android app implemented for capturing the picture is used to select the image. It can either be captured or the image can be imported from the phone gallery.

[2] Image pre-processing

In this step, pre-processing is done on the image like converting the image from RGB format to Grayscale image.

[3] Image segmentation

In this step, the captured and pre-processed image is segmented. The image is traced by creating an rectangular box out of the co-ordinates given to it i.e. the height, width, and the size of the rectangular box to be created. 20x20 is used which is sufficient to suffice the need of tracing the diseased portion.

[4] Feature extraction

The images have been downloaded to create a database of healthy and diseased leaves. They are trained using a haarcascade file which generates a file having threshold values of the images in the database. This threshold values depicts the values for a diseased leaf which helps in the detection of disease. When the image is captured and processed the values of the input image are compared with the threshold values and based on the comparison, the result is displayed.

[5] Classification.

In this step, the disease detection is done on the image. The result is displayed for the image whether it is diseased or not and it is classified whether it had bacterial or fungal disease.

4. RESULT

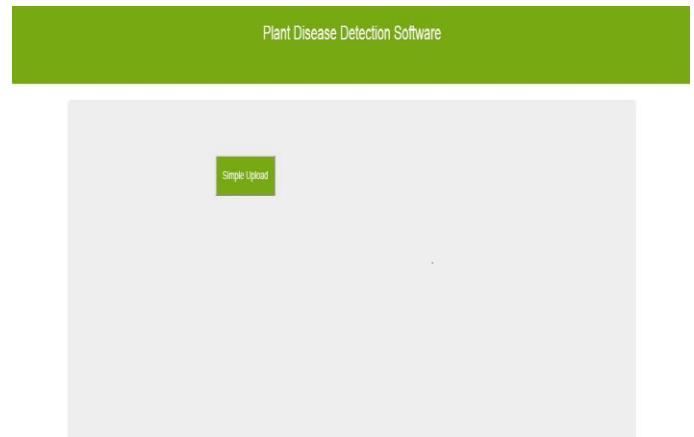


Fig 1. GUI for uploading the photo i.e. Simple Upload button

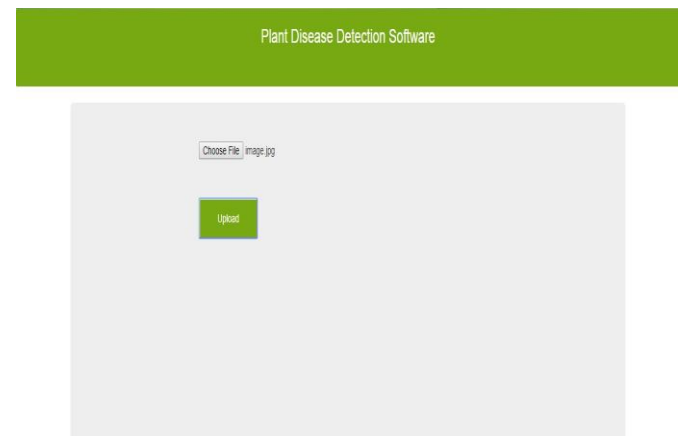


Fig 2. Second page after clicking the Simple upload button i.e. choosing the picture

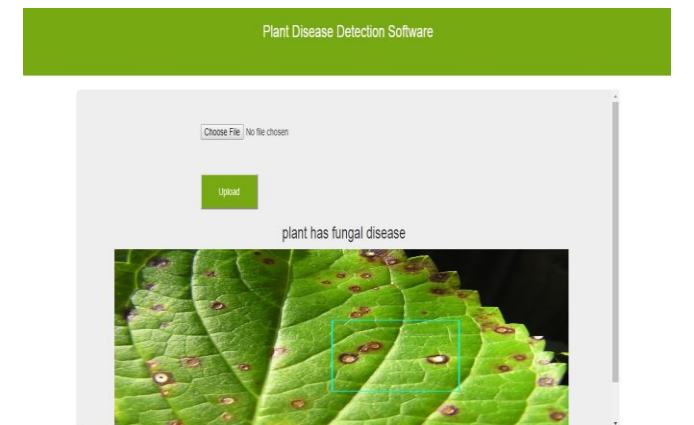


Fig 3. Detection of plant disease

5. CONCLUSIONS

Based on the investigation, grayscale pictures are simple to process and execute. They have superior clarity and suited for investigation than RGB pictures. These types of pictures will be utilized to dissect and determination the plant leaves illnesses and decides the maladies level of the plant takes off.

Versatile phone has ended up accessible at the grass-root level giving distinctive social and economic benefit.

The point of this proposition was to create a user friendly computerized framework for the agriculturists that will help them in deciding location illnesses of takes off without bringing an master to the field.

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