Coconut Tree Disease Identification Using Image Processing To Set A New Trend In Agriculture

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Abstract

The proposed System helps in identification of coconut tree disease and provide the remedies that can be used as a protective mechanism against the disease it is the major objective of the project,in which it focuses on increasing the quality of the product and yield. It is difficult for a farmer to monitor the coconut tree disease manually which may consume a lot of time.The symptoms can be found on leaf, stem,fruits and lesions of a tree. The proposed system provides the usage of mobile phones to capture the image of the affected parts of a tree, and then it will be verified by the expertise and the result will be sent to the farmer and the also the remedy that can be taken as a cure.

Key Words: Image processing, Disease identification, RGB Color Model.

Introduction

India is an Agricultural country. Agriculture is the mother of all cultures. In India we cultivate all kind of crops, this due to the availability of all kinds of soils,enrichment of water, moderate temperature and other materials. India is in the second place worldwide in farm outputs.Agriculture contributes about 17% to the total GDP, hence it is an important sector in Indian economy. It plays a vital role in case of employment, as it provides employment to over 60% of the total population. Agriculture sector provides raw materials for industrialisation. Agriculture also gives its contribution to their national income in smaller percentage.Detecting the disease is the major role as it affects the quality of the product and yield.In recent years, plant pests and diseases has drastically increased. Due to the affect of disease on crops, it reduces the production,food quality,fibre and biofuel crops. This shows agriculture to struggle in case of supporting the rapidly growing global population. Disease are bought up by different types fungi, bacteria, viruses and nematodes. Fungi produces 'my cotoxins' these mycotoxins in turn influences humans and animals. Plant disease are infectious that are caused by living agents or pathogens, which can be spread through an infected plant or plant debris to health plant.85% of plant diseases are caused by fungal. It also effects on environment like soil erosion, land degradation. Farmers invest billions of

dollars on management of disease, but this results in poor disease control this is because of inadequate technical support.Many pathogens cause toxins that would create health issues for consumers.

Literature Review:

Paper[1] First the images are collected from the Grape farm using with different camera, then to that images have to remove the unwanted noise and redundancy present in the image, then have to take out the information from mage, then the Histogram is computed from all of the pixels from the image, in the next stage extracting the information from the leaf images such as color, texture, shape and edges are extracted to get a good results and accuracy, after feature extraction, the features extracted from testing leaves are compared with training leaves. Then the (SVM) method is used for classification of leaf disease.

In paper [2] it represents the method of detecting jute plant disease using image processing. Then Images are captured and then it is realized to match the size of image to be stored in the database. Then image is improved in quality and noises are eliminated.And The image with customized thresholding formula go through the Hue based segmentation. Then the image is changed to Hue, saturation and value (HSV) from Red, Green and Blue (RGB) as it helps extracting region of interest.it in detecting stem oriented diseases for jute plant.

Paper [3] which includes tomato disease detection using computer vision.value..But the thresholding is not a definitive method as this technique only distinguishes red tomatoes from other colors. It becomes very difficult to divide the ripe and unripe tomatoes.For the K-means clustering algorithm is used to overcome the drawbacks. The K-means builds a particular number of hierarchical clusters.Then dividing the infected parts from the leaf the Red, Green and blue (RGB) image was converted into YcbCr to enhance the feature of image. And the last it divides the ripe and unripe tomatoes.

Paper[4] explains about various plant diseases and it has also discussed about precision agriculture (PA) using Image processing. It mainly focuses on Higher yielding and good quality of crops. It develops a method for soil testing and disease identification under the single platform. Here the diseases can be found on many parts of the plant like root, leaf, stem. In this study they have discussed more upon leaf diseases. Its main aim is to produce more number crop yields

Paper[5] In this, they have modified Deep learning algorithms which possess a great significance intelligent agriculture, agricultural production and ecological protection.The region proposal network (RPN) is used to identify and localize the leaves, the images which are segmented by RPN algorithm contain the feature of symptoms through Chan-Vese (CV) algorithm and then they given as a input to the transfer learning model and further it is examined with black rot,and rust diseases.

paper[6] The RGB images which are converted into the gray scale image using color conversion. Various techniques like histogram equalization and contrast adjustment are used for enhancement of image quality.Artificial Neural Network classification are used here. It uses different types of feature values like texture

feature,and geometric feature. By using Artificial Neural Network classification.

In Paper[7] Nowadays Artificial neural network and image processing has become one of the important techniques in plant health detection systems. Here they have designed a device for detecting two types of fungi (Pseudoperonospora cubensis, Sphaerotheca fuliginea) which infect cucumber. The device identifies the disease by detecting the symptoms on plant leaves. So the system includes a CCD digital camera, light dependent resistor lightening module and computer.

Paper[8] this paper is based on the Machine learning algorithm. At last in the results the selection of algorithm plays a important role. The images which are involved in the system should of good quality so that images can be analysed properly. At first it inputs the images of affected areas of crops and the agricultural products, which undergoes some process like, color enhancement and cropping. Further segmentation of images and the feature extraction is done. Through these steps the identification of disease is done.

Objective of the project:

1. To develop an method that allows farmers to identify pests and plant diseases using their mobile phones.

2. Providing remedial measures to diseases, in order to benefit the farmers.

3. As the system model is working through mobile, each and every farmer can access the information at the same time, thus it eliminates the waste of time for standing in a queue.

4.It provide application which is user friendly.

SYSTEM OVERVIEW

In this System we have made an attempt to develop a system which can be operated by using a mobile application on android phones. The farmers are the target user for this system.

The coconut tree get affected by several diseases within march to june. During this period, farmers need to be more cautious about their yield and sometimes they need to take immediate initiatives to save their yield from a certain disease.

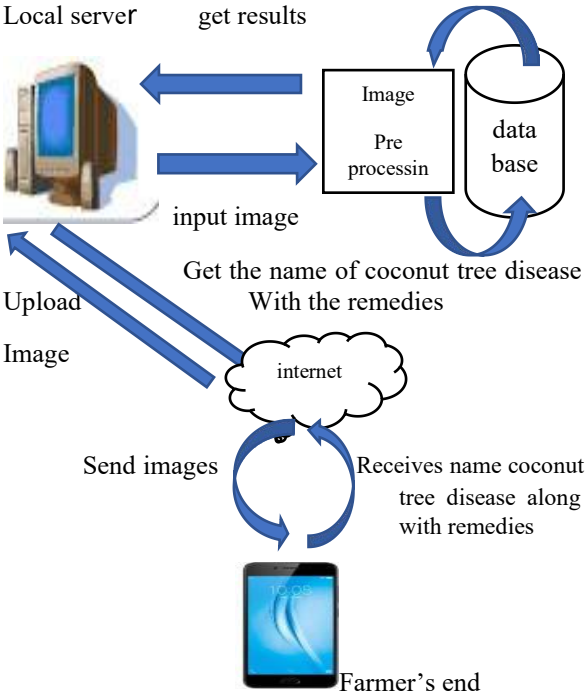


Fig. **System Overview**

If a farmer wants to assess a disease-affected leaf and need to be assured if the plant is suffering from a particular disease or not, then he just has got to use the mobile application and take a picture of the disease-

affected leaf of the coconut tree. Then he will be given the option to send this image to the dedicated system server.

System implementation

Each project is divided into a number of processes or phases, each phase having its own identity and characteristics, the respective phases are:

Initiation Phase
Planning phase
Control phase
Execution phase

Initiation Phase
In a complex environment it is particularly important to identify the detailed scope of the project, the needs and desires of the organization, and any gaps between these and the capabilities of the technology solution.

Planning phase
The project planning phase results in the completion of the Project Schedule and resource planning and allocation. A Project Schedule form is compiled showing detailed activities, with durations and resource allocations. A critical path is normally shown if the project is resource driven, especially with time as a major constraint.

The following items are addressed in the planning phase:
1. Project activity scheduling
2. Organizational and resource planning
3. Procurement planning
4. Quality planning

Control phase
The project control phase comprises of the measurement of activities against the project schedule, and the recording of any variances to these. Variances that could affect the project delivery negatively are given urgent attention (they are referred back to the planning phase) and the necessary planning done or actions taken to restore project delivery as originally planned, if possible.The following items are addressed in the execution phase:

1. Change control
2. Schedule control
3. Quality control
4. Risk controll

Execution phase
The project execution phase comprises the implementation of the items detailed under planning above.This is when design, engineering,testing and commissioning activities are executed.

The following items are addressed in the execution phase:

1. Activity execution
2. Quality assurance
3. Project communications
4. Project plan execution

Methodology:

RGB color model is nothing but adding of red green blue light together in different ways to produce a broad array of colors.It is known as additive color model.

The main use of RGB color model is representation,display of images in electronic system and sensing. It is also used in conventional photography.RGB it is a

device that reproduces a given RGB value differently and responses to the individual R,G,and B levels vary from one person to another and even over time

video cameras, digital cameras and Color TV image scanners are input devices of RGB where as set of various technologies like(plasma, LCD,CRT),mobile phones and computer displays LED displays are typical RGB output devices.

Steps we use in our system are:

1. Java default function FILE CLASS java 8 java 1.25

2. We create File class object which we need to fetch we will store inside it

3. We fetch pixel in the class we take width and height of images and we take this by default function

4. This function will get by class called buffer image

5. This buffer image gives the width and height of the image

6. When we get the width and height of image it gives the height if pixel Values

7. The pixel values will be set by admin

8. Here we use first for loop to height

9. Here we use first for loop to width

10. For ex matrix problems solution r*c,……h*w

11. First h*r

12. Second w*r

13. Like 0 0 first pixel will get

14. Den 0 1 second pixel will get

15. Den 0 2 third pixel will get

16. In buffer image java class, there is class called get RGB () default function.

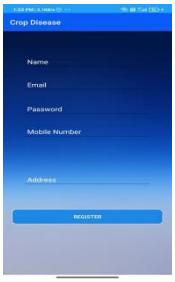
17. This function works like x and q values in matrix form and it calculates the RGB color or each pixel wise what we gone do means we calculate the absolute value and we find the difference.

18. Based on the value we count for all pixel and den.

19. We take the average values and we count the total pixel in image

20. That average values gives the accuracy of the output.

RESULT: In our system,disease are identified using RGB color model,where the images being pre processed and then the disease can be identified.



(a)

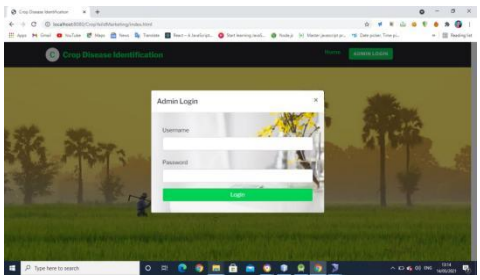
Registration page

(b)

Farmer login page

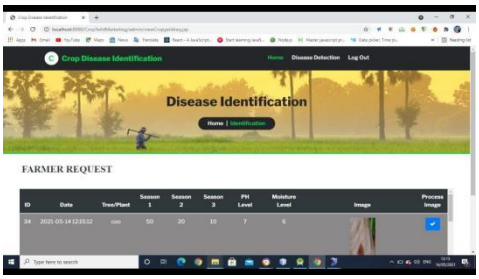
(c)

Upload image



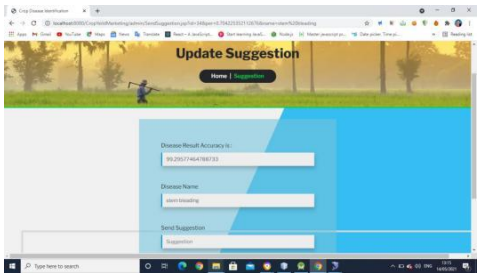
(a)

Admin login page



(b)

Disease processing Image



(c)
Disease name with Suggestions page

Advantages

1.Our Approach is cost effect

2.Easy to use and Operate

3.It provides competitive and transparent

4..Easily accessible information

5.There is no scope for errors. Moreover, storing and retrieving of information is easy So, work can be done speedily and in time.

Conclusion

we have developed a system which will help to predict the crop yield, is one of the major elements that helps in the improvement in crop maturity and quality. For measuring the crop yield, we are taking the crop image and extract the features.

This system goes to be an excellent help to Indian farmers to know about their crop yield. There are many challenges to Indian government like farmer suicide, pollution of land due to pesticides and industrialisation. Hence, this system helps the government in order to help farmers

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