

Plant Health Detection

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Abstract— Agriculture is a key source of livelihood. Indian agriculture consist of many crops and according to survey nearly 80% of population is depended on agriculture. Most of Indian farmers are doing manual cultivation. Farmers are not aware about what kind of crops might grow on their land. Plants are affected by heterogeneous diseases that will affect the production of agriculture and cause profitable loss. It also reduces both quality and mass of production. Leaves are important part of the plants and also more prone to diseases. Currently farmers are spraying pesticides to the plants but it affects, directly or indirectly on humans and various living organisms. To detect these plant diseases many fast and modern techniques need to be provided and used by the farmers. In this paper, we have made an android application that will detect the health of the plant by capturing picture of leaf and detecting diseases and providing proper amount of pesticide.

Keywords: plant leaves; pesticides; android application

I. INTRODUCTION

Agriculture helps in reducing poverty. Almost 80% of world population is employed in agriculture. Work has been done toward accomplishing optimality in terms of production and quality of crops. Farming in India is done using the many traditional and modern ways. The fact that the majority of our farmers do not have access to appropriate knowledge which leads them to hazards damage. Farmers believe in agricultural techniques that are based on the predictions, and experience which at times leads to failure. Farmers must bear huge losses in crop cultivation and at times they end up committing suicide which is the serious issue for society. Since, disease detection in plants plays an important role in the agriculture field, as having a disease in plants are quite natural and it should be solve in organic manner. If proper care is not taken in this area then it can affect plants health and due to which product quality, quantity and market value is also affected. Plant diseases cause a periodic outbreak of diseases which leads to large-scale death of crops. Automatic detection of plant diseases anywhere with proper knowledge of implementation given to farmers is an important research topic as it may prove benefits in monitoring large fields of crops and provide it from damaging, and at a very early stage it detects the symptoms of diseases means when they appear on plant leaves and also give the appropriate pesticide with legitimate seller which have authority to sell that pesticides. Farmers and plant caretakers in nursery could be benefited a lot with an early disease detection application that can be used anywhere, in order to prevent their plants and let the human know what has to be done.

II. LITERATURE SURVEY

The following research related work are selected keeping in mind the traditional approach for the paper and In this section, various research paper have been discussed

Wenjiang Huangetal developed the new spectral indices for identifying the winter wheat disease which are healthy or infected. They consider three different pests(Powdery mildew, tiny whiteness and aphids) in winter wheat for their study. The most and the least relevant wavelengths for different diseases were extracted using RELIEF-F algorithm which is used to extract the disease .The classification inaccuracies of these new indices for healthy and infected leaves with yellow rust and effected were 86.5%, 85.2%, 97.6% and 94.5% respectively [1].Enhanced images have high quality and clarity than the original image which is used to clearly identify the plant. Color images have primary colors red, green and blue which can clearly identify the image. It is difficult to implement the applications using RGB because of their range i.e. 0 to 256. Hence they convert the RGB images into the grey images that is useful for the classification. Then the histogram equalization which distributes the intensities of the images which is applied on the image of leaf. hence image processing is used for the classification of the healthy images and diseased images.

Sachin D. Khirade and A. B. Patil has developed a project on plant disease detection using image processing in this system they have detected the disease of the plant using image processing as the used different image processing technique and its classification of various disease is done by extracting its features .it uses Ann method to classify the disease in plant.it uses various type of algorithm such as back propagation algorithm,SVM etc by using this technique we can easily classify using image processing .

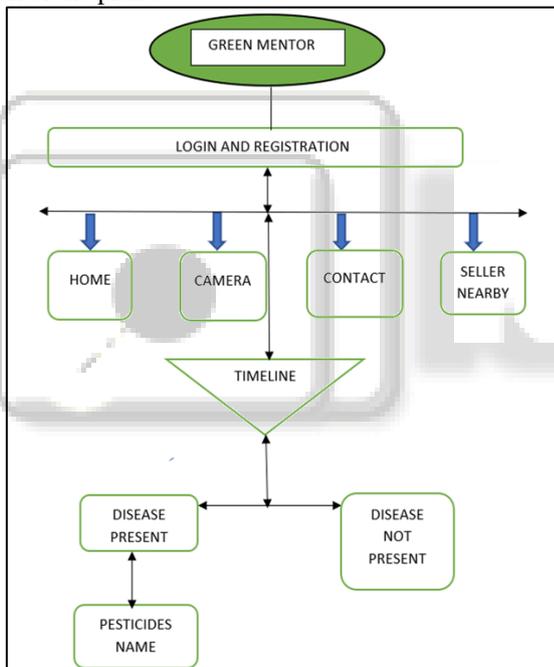
Prof. H.M. Deshmukh, Jadhav Sanjivani, Lohar Utkarsha, Bhagat Madhuri, Salunke Shubhangi developed the project of Plant Leaf Disease Identification System for Android as in this system Based on the analysis, grayscale images are easy to process and implement on the farm . They have better clarity and suited for analysis than RGB images used for images classification. Histogram equalization is used to enhance the contrast of the images and provides clear image to human eyes and they can classify clearly. So, these types of images will be used to analyse the plant leaves diseases and determines the diseases level of the plant leaves. Mobile phone has become available at the base level providing different social and economic benefit of the society. The aim of this proposal was to develop a simple automated system for the farmers that will help them in determining detection diseases of leaves without bringing an expert to the field.

Chaitra K M, [2] Faiza Anjum, [3] Harshitha I P, [4] Meghana D M, [5] Rachitha M V [1, 2, 3, 4] Student, 5Assistant Professor, Plant Leaf Disease Identification System for Android in this paper the Gray-Level Co-occurrence Matrix (GLCM) algorithm is used to identify the images and extract the feature of the images.It detect the leaf of the images and detect the disease is present and the level of the disease present on the leaf.As this android application is used friendly.BharatMishra,Sumit Nema,Mamta Lambert,Swapnil Nema have published the paper Recent

Technologies of Leaf Disease Detection using Image Processing Approach – A Review in this paper has This paper presents, inclusive review of leaf disease detection system using image processing techniques. The simple steps to implement image processing techniques to detect the leaf diseases are given in section . An overview of recently used image processing techniques is described in section . As it used based algorithm such as k means clustering algorithm, KNN algorithm to classify the images to detect the disease.T.Nagarathinam1 , Dr. K. Rameshkumar paper name is A Survey and Research Proposal of Plant Leaf Disease Diagnosis and Classification on Mobile Devices in this paper the mobile application is build using data mining, neural network and image processing is done.This paper is used to detect the disease by capturing the image and segment the images using image processing.As recognition of the plant disease and diagnosis is done using android application.

III. PROPOSED SYSTEM

Here are the basic steps that should be followed to detect the health of the plants.



A. Green Mentor

Green mentor is the name of the android application. As this green mentor application there are various steps that are include to properly detect the leaf of the plant and predict which disease should be detected.



1) Login And Registration:

As in the page the user have to login with the username and also set the password for the security purpose. Farmers first need to get themselves sign in/create an account into the application. Once the account is created, farmer has to register their personal details and land details for example state, type of soil and the which crop detection should be done.

2) Home Page:

Home page consist of all the images of the plants and the information. It consist of news feed of plants which diseases are detected using this application. It contains all the images of the plants with their information that is important for the user.

3) Camera:

The Android framework supports various features such as camera. Camera feature is available on android devices, allowing you to capture live pictures in your applications. Camera of an android device is used to take the picture of the leaf that can used to detect the disease of the plant that is affected by dangerous disease.



4) Timeline:

The timeline consist of all the images that are taken by the camera, time line consists of all the infected as well as healthy plant images. The result of the plant that is taken by the user through camera is displayed in the timeline of the application. As this result consist of plant name and the disease name and the solution of that leaf how to cure that plant, all this information is given in this section

As this time line consist of two types of output

- 1) The disease present, section consists of name of the plant and the disease that are present on leaf also recommending what pesticides to be used.
- 2) The Disease not present, in this section the name of the plant and disease is not present is displayed on the screen.



5) *Contact:*

List of the contact of the seller is displayed in this section. It is useful for the user to contact the seller of the pesticides directly and get the pesticides at preferable cost.

As this seller are legally approved by the government to sell chemical free pesticide at the preferable cost.

6) *Seller Nearby*

As in this section the proper location of the nearby pesticides

Seller is being displayed.

B. Algorithms

1) *Hashing Algorithm:*

This algorithm will encrypt the password entered by the user for login.

This will keep the user id and password secured from attackers.

SHA-1(secure hash algorithm-1) and MD5 (message digest), manifest.MF.

2) *Binary Search Algorithm:*

The algorithm contain 0's and 1's which will help to match the images that we upload with the images that are stored in the database.

3) *K-Means Clustering Algorithm:*

For leaf image detection, we have used k-mean clustering algorithm.

Working of K-Mean Clustering Algorithm are As followed :

- 1) STEP1-Red, blue, green image will be formed first.
- 2) STEP2-The image is partitioned into four clusters.
- 3) STEP3-In which one or more cluster contains the disease.
- 4) STEP4-K-Means use the SQUARE EUCLIDIAN DISTANCE Algorithm.
- 5) STEP5-It Detect the following disease
 - 1) early scorch
 - 2) cottony mold
 - 3) ashen mold
 - 4) late scorch
 - 5) tiny whiteness

C. Advantages of the Proposed System

- Fully Automatic and Simple to use and proper guidelines are provided.
- Mobile cameras are used for capturing the leaf image of the crop anytime and anywhere.
- Display the seller and the contact nearby.

Disease name	features	
	histogram	Detection rate
Early Scorch	1.40	89%
Cottony mold	1.32	90%
Ashen mold	1.56	96%
Late Scorch	1.43	85%
Tiny whiteness	1.56	80%

IV. CONCLUSION

Nowadays with growing population we need the productivity of the agriculture to be increased to meet the increasing demands. Increase in demand also increases use of chemical pesticides without proper knowledge of the crop which led to damage to the environment and also peoples

health. This project ultimately aims at reducing the amount of chemical pesticides that are used by the farmer. It also aims at helping the farmer to know more about crops by giving proper knowledge about plants, their diseases and also proper cure. As this android application will be used to recognize plant disease and it will also suggest the proper pesticides to be used for the particular plant. It analyzes the color features of the spots in plant leaf. The algorithm that we would be using helps in identifying the presence of diseases by observing the visual symptoms seen on the leaf of the plant and also the application is useful to display the nearby seller and their contacts

V. RESULT

Agriculture is important part of Indian economy. In this paper we have developed a system that would detect the disease and provide proper solution. Camera is used to capture the image of the leaf to detect disease present on the crop. It uses k-mean clustering algorithm to classify the leaf, segment it and to analyze it.



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