NITTE MEENAKSHI INSTITUTE OF TECHNOLOGY

(AN AUTONOMOUS INSTITUTION, AFFILIATED TO VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELGAUM, APPROVED BY AICTE & GOVT.OF KARNATAKA)

PB No. 6429, Yelahanka, Bangalore 560-064, Karnataka Telephone: 080- 22167800, 22167860, Fax: 080 - 22167805

Project Title:Cotton Leaf Disease Classification and Pesticide Recommendation

Project Group No:21CSP31

Presentation By:

Bhagesh(1NT20CS039)

Bhavana Manjunath Harikant(1NT20CS040)

Chaithra B J(1NT20CS045)

Mohit J S(1NT21CS407)

Under the Guidance of:

DR. VANI.V

IEEE SM|MACS CP|ABET PV| Professor, Dept. of CS&E, NMIT

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Department of Computer Science and Engineering

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BACKGROUND

1.As we know agriculture is the primary source of food, raw materials, and fuel for a country's economic prospective.

2. Cotton is one of the most important cash crops in India and it plays a crucial role in the industrial and agricultural economy.

3. Direct cotton in India provides direct livelihood to 6 million farmers and indirectly employs about 40-50 million people in its allied processes such as trade and processing.

4. Crop diseases have a negative impact on small-scale farmers whose livelihood is dependent on proper cultivation.

5.To over come this we proposed a work system using a image processing to identify lessons on cotton leaves on the basis of images of the crop in the field is

P.T.O..

proposed for the automatic diagnosis of cotton leaf diseases.

- Classifications based on selecting appropriate features such as color, texture of images are done by using SIFT classifier(The scale-invariant feature transform is a computer vision algorithm to detect, describe, and match local features in images).
- The images are acquired from cotton fields using a digital camera. Various preprocessing techniques as filtering, background removal, segmentation, binarization, and enhancement are done.
- Color-based segmentation is done to obtain the diseased segmented part from the cotton leaf.
- And in additional we are recommending pesticide for respective disease to help users to find the solutions easily.

RESEARCH MOTIVATION

- It is very difficult for farmers to identified various disease in plants.
- The estimated annual crop losses due to plant disease at world wide is $60 Billions.
- The traditional tools and techniques are not very useful since it takes up lots of time and manual work.
- However with the help of disease detection system these difficulties will no longer prevent.
- It is quite difficult for the farmers to identify the particular pesticide for the disease.

PROBLEM STATEMENT

Problem Statement: “Design and Development of Smart system to identify the disease and recommending pesticide for the cotton leaf”.

- Along with these we are providing some additional information about how to avoid these disease.

RESEARCH OBJECTIVES

The research objectives of proposed system to help farmers in the crop production ,that includes:

- To populate the dataset by considering various features of the healthy as well as diseased cotton leaves from the Haveri district.
- To apply **image processing techniques** to preprocess the image dataset of cotton leaves detect the healthy and diseased cotton leaves ,then store it in the database .
- After classify the disease of test data using **machine learning algorithms** and suggest pesticide recommendation.

LITARATURE SURVEY

AUTHOR NAME	PAPER TITLE	PAPER CONTENT
[1] Dr. S. R. Ganorkar and Pawan P. Warne	Disease Detection of Cotton crop using Image Processing Technique	mentioned in their paper In order to prevent the crops from suffering significant losses, this research outlines a method for careful disease detection, diagnosis, and prompt handling. The yield of cotton has dramatically decreased as a result of the diseases that affect cotton. As a result, the study of interest is focused on the cotton leaf rather than the entire plant
[2] Pranita P. Gulve 1 , Sharayu S. Tambe2 , Madhu A.Pandey3 ,Mrs S.S.Kanse4	Leaf Disease Detection of Cotton Plant Using Image Processing Techniques	Dentification of the symptoms of plant diseases by means of image processing techniques is of prime concern in the area of research. There is a need for a plant disease diagnosis system that may support farmers during their daily struggle

[3] Azath M. , 1 Melese Zekiwos,2 and Abey Bruckz	Deep Learning-Based Image Processing for Cotton Leaf Disease and Pest Diagnosis	Cotton is one of the economically significant agricultural products in Ethiopia, but it is exposed to different constraints in the leaf area. Mostly, these constraints are identified as diseases and pests that are hard to detect with bare eyes. 'is study focused to develop a model to boost the detection of cotton leaf disease and pests using the deep learning technique, CNN.
[4] D. Naik, and A. Vyavahare	Disease Detection of Cotton crop using Image Processing Technique: A Survey,” s	Mentioned ,agriculture is the prime occupation in India . Meteorological parameters such as temperature, rainfall, and humidity areimportant for agricultural systems. Changes in climatic conditions andimproper methods of cultivation lead to loss of crop productivity. Therefore, forecasting of weather is of very important to overcome these problems

[5] Avinash Kumar, Sobhangi Sarkar and Chittaranjan Pradhan	Recommendation System for Crop Identification and Pest Control Technique in Agriculture	Problem that a farmer generally encounters is the pest and diseases that can affect the crops they grow, which they are generally unaware of in an early stage. This problem of farmer is addressed in our paper and we have tried to solve it with the help of a Recommendation System
[6] P. Warne and S. Ganorkar	Detection Of Diseases On Cotton Leaf Using K-Means Clustering Method	This paper even mentioned The Image RGB feature pixel counting techniques. It is extensively applied to agricultural science, and it has a great perspective, especially in the plant protection field, which ultimately leads to crop management.
[7] R. V. Kshirsagar and P.R. Rothe	SVM-Based Classifier System For Recognition Of Cotton Leaf Diseases	A key component of a pattern recognition system is feature extraction. The classification process is more effective and efficient when a unique feature extraction algorithm is used. Because they have a significant impact on the quality and production of cotton, it is crucial to identify and classify cotton leaf diseases.

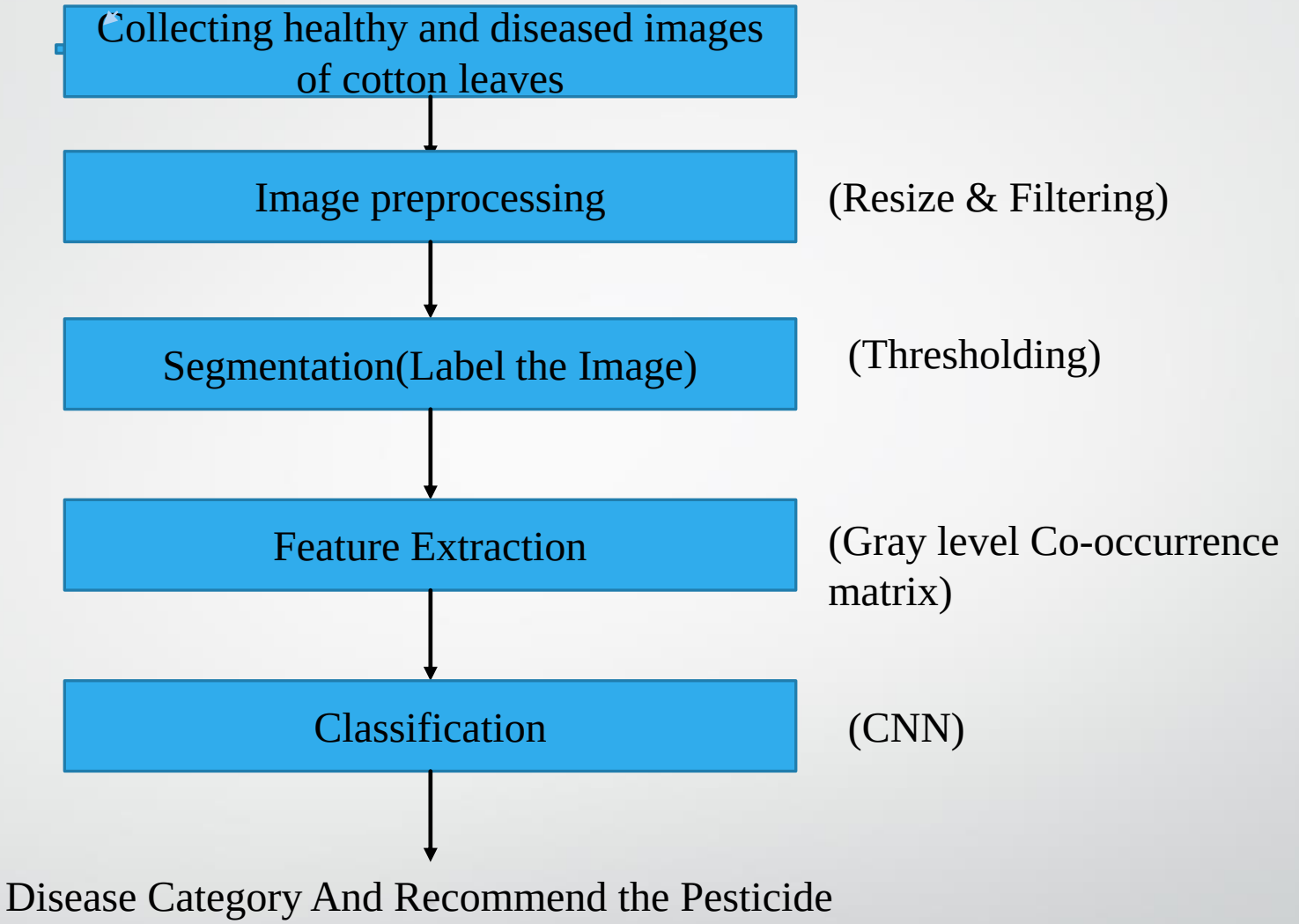
PROGRESS OF THE WORK

- **Front-End(UI):-** For the frontend, we have decided to use the popular React framework to create a dynamic user interface that is both fast and responsive.
- **Back-End(Server):-** On the backend, we have chosen Node.js and Django as our server-side framework due to its scalability and flexibility
- **Image Processing**:-Image processing is used to manipulate, analyze, enhance, and restore images.

Front-End(UI):


} }; return (
Cotton Leaf Disease Detection
Browse...
No file selected.
Detect Disease
{selectedImage && (
Selected Image:
Selected
)} {result && (
Result:
{result}
)}
); } export default App;

Flow Chart


Collecting healthy and diseased images of cotton leaves
Image preprocessing
(Resize & Filtering)
Segmentation(Label the Image)
(Thresholding)
Feature Extraction
(Gray level Co-occurrence matrix)
Classification
(CNN)
Disease Category And Recommend the Pesticide

The workflow diagram shows the following steps:

1.Image acquisition: The first step is to acquire images of cotton leaves. This can be done using a digital camera or smartphone.

2.Image preprocessing: The next step is to preprocess the images. This includes steps such as resizing, cropping, and adjusting the brightness and contrast.

3. Segmentation Segmentation is the process of assigning a label to every pixel in an image such that pixels with the same label share certain visual characteristics. It involves partitioning an image into groups of pixels which are homogeneous with respect to the pixel labeling criterion. Segmentation approach employed in the present work namely thresholding based masking.

4.Feature extraction: The next step is to extract features from the images. This can be done using a variety of techniques, such as color histograms, edge detection, and texture analysis.

5.Classification: The final step is to classify the images. This can be done using a variety of machine learning algorithms, such as support vector machines, decision trees, and neural networks.

6.Pesticide recommendation: Once the images have been classified, the system can then recommend pesticides that are effective against the detected diseases.

Image Processing : Algorithm

Step 1: Load and preprocess the dataset

Step 2: Extract features from the dataset

Step 3: Train the classifier

Step 4: Predict disease and recommend pesticides

Step 5: Evaluation

- Importing libraries and images.
- Set the path according to where you have downloaded the dataset
- Now we will split data for training testing and validation.
- After splitting the data we will pre-process it to get into right format.
- Now we will reshape the images to add a depth of 1.
- After this we will augment our data which will give better results.
- Now we are converting the label data into categorical data.
- Next, lets build our model
- Note that here I have used categorical loss, even though this is a binary classification, so you can use “binary_crossentropy” as well.
- Now, we will start training our model. Also if you are using a GPU then the training time will decrease significantly.

- It will take some time to train, so sit back and relax!
- Once training is done lets check the results.
- Next we will save our model.
- Finally lets make some predictions and crosscheck it.
- We will select a random image from our testing set to compare.

TIMELINE

•Week 1: Gather data on cotton leaf diseases and pesticides. This data could be collected from a variety of sources, such as scientific journals, government databases, and industry publications.

•Weeks 2-4: Develop image processing model to detect cotton leaf diseases. This model will manipulate, analyze, enhance, and restore images on the data collected in week 1.

•Weeks 5-8: Develop a user interface for the system. This interface will allow users to upload images of cotton leaves and receive a diagnosis of the disease.

•Weeks 9-12: Test the system and make any necessary adjustments.

•Week 13: Deploy the system and make it available to users.

CONCLUSION

The proposed plant disease diagnosis system serves the farming community to improve their crop productivity by correctly classifying the disease type being occurred . The system is developed to detect cotton plant disease spots. The system effectively segments the diseased portion of the image of leaf sample using thresholding based region extraction (diseased spots).

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[3] Azath M. , 1 Melese Zekiwos,2 and Abey Bruckz,”Deep Learning-Based Image Processing for Cotton Leaf Disease and Pest Diagnosis” Hindawi Journal of Electrical and Computer Engineering

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[6]P. Warne and S. Ganorkar, “Detection Of Diseases On Cotton Leaf Using K-Means Clustering Method,” International Research Journal of Engineering and Technology (IRJET), Pp. 425–431, 2015.

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THANK YOU