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Report on Leaf Disease Detection Using Image Processing

Ghanashyam M*1, Sumanth B N *2 , Prof.Vidya Shankar *3, Puneetha M P*4

*1UG Scholar (BCA),Dept. of computer science, JSS College Arts, Commerce, Science (JSSCACS), Mysore, Karnataka, India
*2UG Scholar (BCA),Dept. of computer science, JSS College Arts, Commerce, Science (JSSCACS), Mysore, Karnataka, India
*3 HOD and Professor, Dept. of computer science, JSS College Arts, Commerce, Science (JSSCACS), Mysore, Karnataka, India
*4 Asst. Professor, Dept. of computer science, JSS College Arts, Commerce, Science(JSSCACS), Mysore, Karnataka, India

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Abstract –

Farmers need automatic disease monitoring systems in order to improve crop development and yield. It takes a lot of time and experience, which is often expensive or unavailable, to perform manual monitoring, which is out of date. With an emphasis on leaves and fruits, this paper presents a novel method for quickly and accurately detecting plant diseases through the use of digital image processing. For disease detection and classification, the suggested approach combines a multi-SVM algorithm with a k-means clustering technique in MATLAB. About 70% of the people in India is dependent on agriculture, which is the backbone of the country's economy. Crop diseases are frequently the result of changes in the climate, such as intense rainfall and temperature swings. It takes a lot of time and money to diagnose severe illnesses using conventional methods, thus professional assistance is required. In order to detect plant diseases effectively and accurately, this research explores a contemporary method that uses image processing techniques. It focuses specifically on leaf infections.

Key Words: *capturing images, preliminary processing, feature extraction categorizing, neural net.*

1.INTRODUCTION

India is a country based mostly on agriculture. Agriculture accounts for 70% of India's GDP. Crops become infected as a result of climatic changes such as intense rainfall and sharp temperature swings. And those can be identified by defoliation, colour changes, spots on the leaf, and dryness of the leaf. The majority of people are unable to quickly and correctly recognise the illness. We need specialists who can diagnose the illness in order to accomplish it. However, this is a more costly and time-consuming procedure. The suggested project, which aims to detect leaf infections, uses image processing techniques because images are a valuable source of information and data for biological science. Digital image processing and image analysis technology, which are based on advancements in micro electronics and computers, have numerous biological applications.

1.2Theproject'shistory

Disease identification heavily relies on image segmentation, which is the process of breaking a picture up into its component pieces. There are several approaches available, ranging from basic thresholding to sophisticated colour image segmentation. In order to find distinct features that would be difficult for computers to recognize without intelligent processing, this study uses evolutionary algorithms for colour image segmentation.

1.3 The Project's Goal

- The objective is to increase the accuracy of leaf disease detection.
- Partitioning the leaf according to disease status
- The goal is to obtain the input of the processed leaf image.
- The K-Means clustering algorithm will be used to segment the image.
- Lastly, use an SVM classifier to determine the disease type and severity level that has affected the leaf.
- combines and synthesizes prior understanding of a topic.
- Illustrates how you have applied other people's knowledge and how your research has generated new concepts.

II. TECHNIQUES

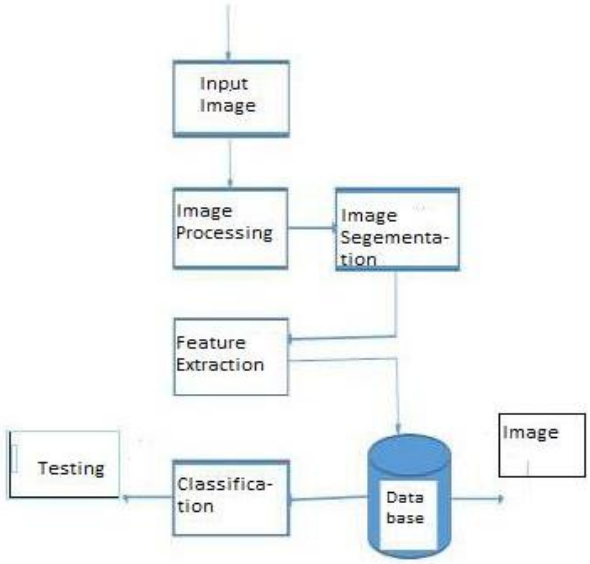

Fig -1: The suggested method's block diagram

- **Image Input:**

To identify illnesses, we employed digital leaf photos. Several internet sources provided the photos. We employed black spot, anthracnose, and rust—three prevalent rose diseases—in our study. JPEG photos of the diseases are displayed in Fig.1

B.ImagePreparation:

The first step before feature extraction is image pre-processing chores. Image preprocessing processing consists of three steps: image conversion, image enhancement, and picture cropping. The image is turned to grayscale after being trimmed to remove leaf diseases. We applied a Laplacian filter to improve the image.

III. A BASIC SYSTEM BLOCK DIAGRAM THAT INCLUDES A DESCRIPTION

- **Inactive Stage:**

An image analyzer is used to extract anomalous features from a huge number of defective photos. The classifier will then use these features that have been saved in a feature database.

- **Online Stage:**

Diagnoses are made easier when an abnormal feature of a particular defective image is retrieved by an image analyzer and then categorized into a particular disorder by a classifier. An image analyzer's primary goal is to identify any aberrant symptoms of a colour picture defect that are represented by spots in terms of size, colour, and shape. The obtained defected colour image serves as the image analyzer's input, and the extracted characteristics of the defected image serve as the analyzer's output, as seen in the figure below.

III.EXPERIMENTAL SNAPSHOTS:

Fig (a): Input Image

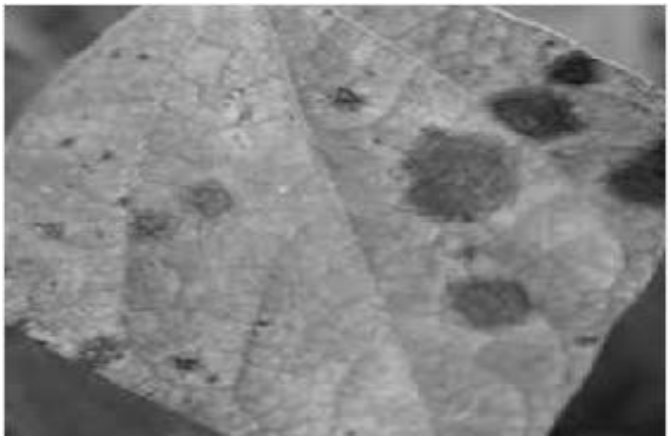

Fig (b): Preprocessing Enhanced Image

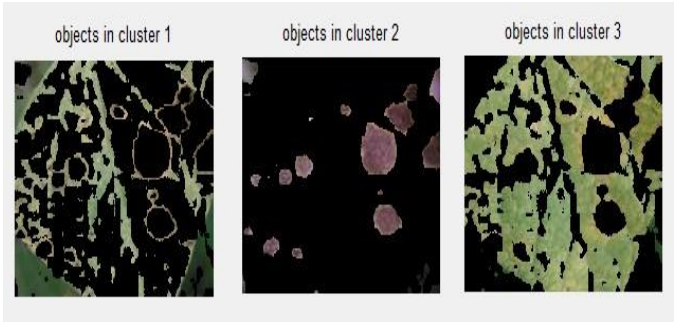

Fig (c): Segmentation of Image

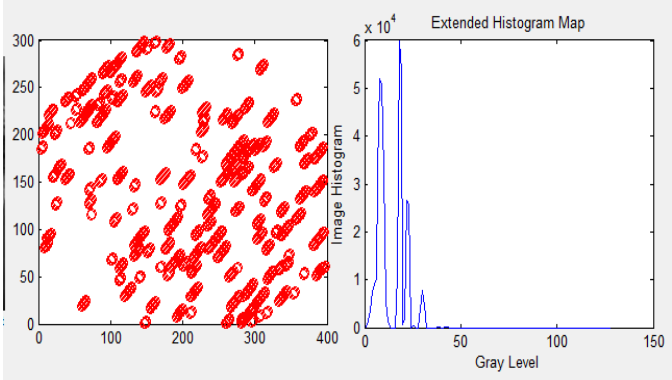

Fig (d): Classification of Image

IV CONCLUSIONS

This study gives an overview of the many disease classification methods used to identify plant leaf diseases, along with an algorithm for picture segmentation that can be utilized for both automatic plant leaf disease detection and classification in the future. The 10 species that the suggested algorithm is tested on include bananas, beans, jackfruit, lemons, mangoes, potatoes, tomatoes, and sapotas. Consequently, these plants' associated diseases were collected for identification. Optimizing the results required very little computing work, demonstrating the effectiveness of the suggested method in identifying and categorizing leaf illnesses. The ability to detect plant diseases at an early or preliminary stage is another benefit of employing this approach. In order to increase the identification rate during the artificial.

V.FUTUREEXTENT

Using the technique described in the thesis, a soy bean expert system for farmers may be created that will enable early plant foliar infection detection, infection grading, and remote delivery of the proper remedy. We have attempted to draw attention to the issues surrounding the production of soybeans and the reasons behind low yield loss in developing nations such as India through our thesis work. Six foliar diseases that cause significant yield loss in soya plants have been identified: rust, bacterial blight, brown spot, downy mildew, frog eye, and sudden death syndrome. A fully automatic method has been proposed to identify and classify these diseases using various digital image processing techniques, as well as to classify the disease severity level using five classes.

REFERENCES

[1] "Spectrum-based Method for Quantitatively Detecting Diseases on Cucumber Leaf," 2011 IEEE, Hong-ning Li, JieFeng, Wei-ping Yang, Xiang-sheng Wu, Ze-dong Li, Wei Liu).

[2] "Classification of Rubber Tree Leaf Disease Using Spectrometer," Al Junid, S.A.M.; Haron, M.A.; Osman, F.N.; Hashim, H.Citrus canker identification by leaf image analysis, Min Zhang, Qinggang Meng, IEEE, 2010.

[3]Dheeb Al Bashish, Sulieman Bani-Ahmad, and Malik Braik "A Framework for Detection and Classification of Plant Leaf and Stem Diseases" 2010 by IEEE.

[4] Kholis Majid, Yeni Herdiyeni, Aunu Rauf "I-PEDIA: Mobile Application for Paddy Disease Identification using Fuzzy Entropy and Probabilistic Neural Network" ICACSIS 2013, IEEE

[5]Digital image processing methods for identifying, measuring, and categorising plant diseases (SPRINGER PLUS-2013) is discussed by Mrs. Jayme Garcia ArnalBarbedo in .

[6] "Advances in image processing for detection of plant diseases," Smita Naikwadi and Niket Amoda, International Journal of Application or Innovation in Engineering & Management, pp. 168–175, November 2013.

[7] In 2011, Al-Bashish, D., Braik, M., and Bani-Ahmad, S. "Detection and classification of leaf diseases using Kmeans-