ISSN No:-2456-2165

Mulberry Leaf Disease Detection

Nagaveni B Nimbal [1]
Asst Professor
Department of Computer Science
KSSEM
Bangalore, India

Namratha S [2]
Student
Department of Computer Science
KSSEM
Bangalore, India

Arshitha K [3]
Student
Department of Computer Science
KSSEM
Bangalore, India

Chaithra Shetty S [4]
Student
Department of Computer Science
KSSEM
Bangalore, India

Bhuvanashri KB [5]
Student
Department of Computer Science
KSSEM
Bangalore, India

Abstract:- Sericulture is an important domestic industry. In India, it is one of the eco-friendly industries. India is the only country where all five recognized commercial silks are made, namely mulberry, tropical tasar, oak tasar, eri and muga. Sericulture is labor intensive, providing jobs in India for over 8 million people, and serving Indians as a tremendous source of revenue. Silkworm is sericultural foundation. Commercial silk is developed through the production of different types of silkworms, of which BOMBYX MORI, originally from Asia, is the most widely and economically used, Mulberry is significant sole nourishment for mulberry silkworm. It is also used for medicinal benefits like, treating diabetes. These mulberry plants include a high danger of yield disappointment and are over the highest expensive for production, so should be addressed well indeed. We will present an overview on various types of mulberry leaf diseases and different classification techniques in machine learning that are used for identifying diseases in different leaves and how to mange these diseases.

Keywords:- *Plant Disease, Image Preprocessing, Disease Classification, Support Vector Method, KNN*

I. INTRODUCTION

Sericulture is an agro-based industry. India is second largest producer of silk. Sericulture has following highlights: high work potential, gives energy to town economies, Low Gestation and High Returns, women friendly occupation, Eco-accommodating Activity. India has the one amongst a form qualification of being the main nation delivering all the five known business silks, especially mulberry. Mulberry silk is more produced in India from Karnataka, Andhra Pradesh, Tamil Nadu, Jammu & Kashmir and West Bengal, while the non-mulberry silks are produced in the states of Jharkhand, Chhattisgarh, Orissa and north-eastern states. Agriculture is a key source of livelihood. Agriculture provides employment opportunities for village people on large scale in developing country like India. Most of Indian farmers are adopting manual cultivation due to lagging of technical knowledge, when plants are affected by diseases through leaves that will affect production of agriculture and profitable loss.

Leaves are important for fast growing of plant and to increase production of crops. Identifying these diseases in plants leaves is challenging for farmers. They are integral part of the plant system they play a major role in preparation of food in plants. The detection process is essential one in the agriculture field in the beginning of a series of activities to fight the plant disease and reduce their spread as soon as they appear on leaves of the plant. Technology has grown to such an extent that a machine is capable enough to predict the leaf disease without human intervention.to predict these diseases we use KNN and SVM algorithm. Mulberry silk originates from the silkworm, Bombyx mori L7 which exclusively benefits from the leaves of mulberry plant. These silkworms are totally domesticated and reared indoors. Other uses of mulberry leaves are seen in the fields of health and skin care. These mulberry plants include a high pace of yield disappointment and are over the top expensive for creation, so should be dealt with quite well. The customary methodology for identification of diseased leaves is through naked eye, this method is not precise and brings about use of wrong pesticides or synthetic compounds and hence pulverizing the yield and farmers may watch just when the plant is completely contaminated which may cause an infection flare-up in the homestead. There is a possibility for counselling specialists, yet farmers living in remote towns probably won't manage cost of travelling expenses because the test results from the lab could few days and farmer needs to travel ordinarily and in hardly any towns specialists from government division visits the sector however not on standard premise. Our goal is to overcome these problems using a farmer- friendly system

ISSN No:-2456-2165

where the result involves cure of the disease and the fertilizer or pesticide proportion to be used, and also future preventive measures to be undertaken are displayed on the user interface.

II. RELATED WORK

The image of the leaf is taken and then converted into greyscale image. Using texture feature including contrast, local homogeneity, cluster shades are also used. For image classification, SVM classifier and minimum distance criterion is used. The data collection is done by taking pictures and then image is preprocessed using image annotation and augmentation. Image analysis is done using multiple extractors. For experimentation dataset is divided into testing, training and validation sets. System can classify the diseases using algorithm. the image segmentation including all existing factors using the HSI color system, here H component is used to segment spots and to reduce illumination. The regions with disease spot segmented using Sobel operator. Disease is finally graded by the calculation of leaf spots. the affected region and leaf segment area respectively. In the final step, the disease is classified using quotient calculation of leaf and lesion area. According to this research, this method is fast and calculation of leaf disease severity is accurate, here leaf area is calculated by using threshold segmentation disease detection using KNN and SVM algorithm. Feature extraction and statistical features. Different statistical features energy, sum entropy, covariance, information measure, entropy contrast. The system can detect the disease with accuracy.

III. MULBERRY DISEASES

A. *Powdery Mildew*

Powdery Mildew Disease of mulberry is caused by fungal Pathogen, *Phyllactinia corylea*. The major symptom of this disease is an appearance of white powdery patches on the lower surface of the leaves. When the disease is severe, the white powdery patches turn in to brownish-black; the leaves become yellow, coarse and lose their nutritive value. The severely infected leaves will be become powder brittle even after gently crumple by hand.

Fig 1: Leaf spot

B. *Leaf Spot Disease*

- *Leaf Spot Disease of mulberry is caused by a fungus,* Cercospora moricola.

At the beginning of the disease there will be small light brown irregular spots appear on mulberry leaf surface. Later, these spots enlarge and join together leaving with characteristic ‘shot hole’ and yellow patches around the brownish spot and wither off.

Fig 2: Leaf spot

C. *Leaf rust disease*

- *Mulberry leaf rust disease is caused by* Peridiospora mori *fungus.*

At the rust disease initial stage, the symptoms is a circular pin head sized light brown spots and becomes darkish brown spots as disease advances. The leaf loss is up to 5 %. Rust severity significantly increased with increasing shoot age, irrespective of pruning time.

Fig 3: Leaf rust

D. *Leaf curl*

Curly leaves of mulberry revealed the presence of Taeniothrips, attacking mulberry leaves. The attack of this taeniothrips to mulberry leaves is known from India and Sri Lanka. They injure epidermal tissue and affected leaves show early maturity, depletion of moisture, reduction in crude protein silkworm rearing. Taeniothrips affected leaves generally show streaks in the early stage of attack whereas blotches are observed at the advance stage and ultimately become yellowish-brown on maturity.

ISSN No:-2456-2165

Fig 4: Leaf curl

IV. LITERATURE REVIEW

❖ *Detection of plant leaf diseases using image segmentation and soft computing techniques. Information Processing in Agriculture*

A generic algorithm for image segmentation is presented. Soft computing techniques are used for image segmentation. Here, the images are converted into greyscale, and texture featuring methods such as local homogeneity, cluster shades are also used. SVM classifier and minimum distance criterion are used in image classification

A. Plant Disease Detection in Image Processing Using MATLAB

plant leaf disease detection is done using KNN and SVM algorithms. The different statistical features energy, sum entropy, covariance, information measure, entropy contrast is being considered,

B. Feature Extraction

In this feature extraction the shape, colour & texture is identified. The aim of this phase is to extract features such as colour and shape. Two shape features such as area and perimeter are extracted This includes two phases: image resize and image filtering

C. Classification

The final stage of the work is selection of suitable classification algorithm for classification of leaf disease to the category they belong. Support Vector Machine (SVM) is a supervised machine learning algorithm that can be used for classification. SVM is popularly used in texture and classification. After extracting colour and texture features of leaves the classification.

V. THE PROPOSED METHOD

The Project aims at classifying the diseases in plant leaf at the earlier stage prevent the plants from the diseases. The model is based on Supervised Learning Algorithms to detect the disease which is more accurate for classification purposes. SVM, KNN, DT techniques are used in classifying the plant leaves into healthy or diseased, if it is a diseased plant leaf these algorithms will give the name of the particular disease and control measures. At first an input image is selected from the folder which under goes image acquisition, pre-processing where it undergoes rescaling, converting into grey scale and removal of noise. Then the training images are subjected to feature extraction. The texture features extracted are used for classification. The classification results detect and categorized based on the disease of leaf. The output is obtained at last which indicates the disease name along with its control measures for the better management of the crop. For feature extraction we have used EHD, HOG and GLCM. For classification we have used SVM, KNN and decision tree, where we have applied cross validation for SVM. After the image under goes Acquisition, Pre-processing, Feature Extraction and Classification the result will be obtained in the user interface. This contains cure of the disease and the fertilizer or pesticide proportion to be used and also future preventive measures which helps the farmer to manage the disease.

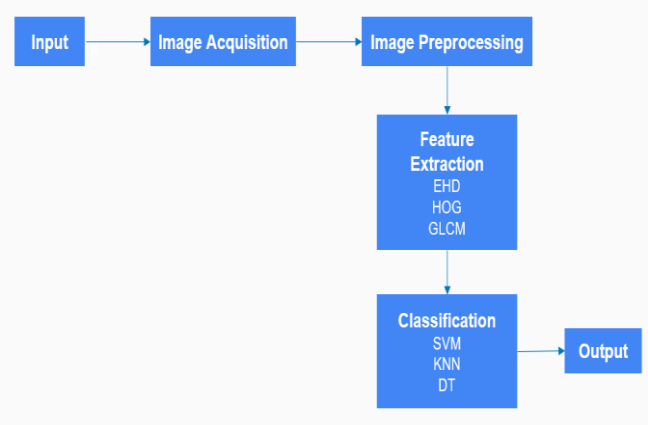

Fig 5: Work Flow of Application

VI. RESULT AND ANALYSIS

The disease classification performance analysis of the KNN classifier on leaf dataset. The leaf disease detection and classification result has been simulated on MATLAB. The segmentation output of the KNN classifier has been compared with the manually segmented result of the leaf image.

VII. CONCLUSIONS

In this paper, we briefly explained the Mulberry leaf disease detection. We were able to detect the disease using SVM and KNN algorithm. After the dataset is required and given as input, preprocessing takes place and will detect the mulberry leaf disease and their solution automatically once the disease is identified.

REFERENCES

[1]. 24th International Conference on Information Technology (IT) Zabljak, 18 – 22 February 2020 Image-Based Plant Disease Detection: A Comparison of Deep Learning and Classical Machine Learning Algorithms Draško Radovanović 1, Slobodan Đukanović 1, 2, Member, IEEE.

[2]. International Conference on Communication and Signal Processing, April 4-6, 2019, India Machine Learning for Plant Leaf Disease Detection and Classification – A Review L. Sherly Puspha Annabel, Member, IEEE, T.

Annapoorani and P. Deepalakshmi.
[3]. 2018 International Conference on Computer, Control, Informatics and its Applications, Machine Learning-based for Automatic Detection of Corn-Plant Diseases Using Image Processing Budiarianto Suryo Kusumo, Ana Heryana, Oka Mahendra, and Hilman F. Pardede, IEEE
[4]. 2019 International Conference 7-9 February, 2019, A Color and Texture Based Approach for the Detection and Classification of Plant Leaf Disease Using KNN Classifier Eftekhar Hossain1, Md. Farhad Hossain2 and Mohammad Anisur Rahaman3, IEEE
[5]. Proceedings of the Second International Conference on Intelligent Computing and Control Systems (ICICCS 2018), Diseases Detection of Cotton Leaf Spot using Image Processing and SVM Classifier Namrata R.