

Survey on Leaf Disease Detection using Image Processing

Megha Ramchandra Lolure¹, Dr. Vaishali. M. Deshmukh²

Department of Computer Science and Engineering, PRMITR, Badnera, Maharashtra, India¹

Faculty of Computer Science and Engineering, PRMITR, Badnera, Maharashtra, India²

ABSTRACT: 70% of rural population that *lives* in India struggling to survive on agriculture field. And 60% of world population depends on agriculture for their bread and butter. So it is need of time to cultivate our farm. Also required to increase the production of crops in our farms. Increasing crop yields depends on natural factors. One of the most important is to protect our crops from various types of diseases. Plant leaf disease s detection plays important role in preventing dangerous outbreaks. Many diseases of plant are due to bacteria, fungi and viruses. Disease in plants means just destruction of live plants only. Studying various plant diseases means to study various patterns on the plant, which are visible by eyes. Monitoring of plant and detection of disease of plant is very critical for well-grounded agriculture. Monitoring plant disease manually is very difficult task. It requires large work, suggestion and observations of expertise in finding the disease of plants. Processing time is more in this case. Therefore to save time, detection of plant disease is done by using image processing. Detection of disease involves steps like acquisition of image, pre-processing image, segmentation of image, extraction of feature and classification. The study discussed different methods which are use full in the detection of plant diseases with the help of images of leaf.

KEYWORDS:

SVM - Support Vector Machine.

ANN - Artificial Neural Network.

PNN - Probabilistic Neural Network.

HPCCDD - Homogeneous Pixel Counting Technique for Cotton Diseases Detection.

NN - Neural Network.

I. INTRODUCTION

About 70% of the population of an India depend on agriculture. In India many crops have been taken by the farmers to fulfil the need of Indian people. The crop include grains, pulses, oilseeds fruits, vegetables, medicinal plants as well as decorative plants for home and garden purpose. The various diseases in the plants is a very crucial problem. Due to these diseases the farmers have to bear considerable loss of their crops. There are different pesticides available in the market for different diseases in the plants. The visualization of the disease in the plant can be observed on leaves, buds, stems, fruits which leads to partial or complete damage of that part. These diseases need to be controlled within time to minimize the loss . The pesticide suitable for particular disease can only be suggested by the expert after inspection of the crops which is a very time consuming process and in many cases it is not possible for the expert to visit every crop personally. Many researches have been carried out to work out the feasibility of use of modern techniques in detection of the diseases. Image processing is one of the useful and effective method for detection of diseases in the plants. This study highlights on some research works done in the field of plant disease detection by image processing. Some papers are describing to detecting leaf disease using various methods suggesting the various implementation ways as illustrated and discussed here.

II. LITERATURE SURVEY

S.N.	Name of Author	Paper	Methodology	Accuracy	Future Work
01	S. Arivazhagan et.al.[4]	Detection Of Unhealthy Region Of Plant Leaves And Classification Of Plant Leaf Diseases Using Texture Features	SVM classifier with Color co-occurrence method .	87.66%	By increasing training samples, optimal feature can be fed as input for identification of leaf diseases.
S.N.	Name of Author	Paper	Methodology	Accuracy	Future Work
02	SmitaNaikwadi et.al.[7]	Advances In Image Processing For Detection Of Plant Diseases	The color co-occurrence texture analysis method was developed through the use of Spatial Gray level Dependence Matrices	90%	On the basis of advance feature and large database of color extraction, better result of disease detection can be obtained.
03.	Anand.H.Kulkarni et.al.[5]	Applying Image Processing Technique To Detect Plant Diseases	Feature extraction by Gabor filter and classification by ANN classifier.	91%	Increasing recognition rate.
04	Prof. Sanjay B. Dhaygude et.al.[2]	Agricultural Plant Leaf Disease Detection Using Image Processing	Algorithm on vision-based detection with Color Co-occurrence method with Masking the green-pixels.	Accuracy level is not mentioned	Recognition rate of classification process is to be increased by NN's.
05	Mrunalini R. Badnakhe et.al.[3]	An Application Of K-Means Clustering And Artificial Intelligence In Pattern Recognition For Crop Diseases	Detecting leave disease automatically by using algorithm of K-means clustering with Neural networks	Accuracy level is not mentioned	Classification of crop diseases by using other soft computing techniques with ANN and fuzzy logic.
06	Sabah Bashir et.al.[6]	Remote Area Plant Disease Detection Using Image Processing	Texture segmentation by using K-means Clustering Technique and co-occurrence matrix method .	Accuracy level is not mentioned	Classification of various plant diseases by using Bayes classifier, K-means clustering and principal component classifier.
07	Sanjay B. Patil et. al.[8]	Leaf Disease Severity Measurement Using Image Processing	Triangle thresholding, Simple threshold and segmentation methods	accuracy level is not mentioned	Nil
08	P.Revathi et.al.[9]	Classification of Cotton Leaf Spot Diseases Using Image Processing Edge Detection Techniques	Edge detection based Image segmentation and Homogeneous Pixel Counting Technique for Cotton Diseases Detection (HPCCDD) Algorithm. homogenization techniques Sobel and Canny	accuracy level is not mentioned	Nil
09.	H. Al-Hiary et.al.[10]	Fast and Accurate Detection and Classification of Plant Diseases	k-means clustering, color co-occurrence methodology,and NNs, Otsu's method	accuracy level is not mentioned	Nil

III. SUMMARY OF LITRATURE SURVEY

Many research works from different researchers have been studied for leaf disease detection and the summary of the studies is as follows.

01. Review of SVM, ANN, SELF ORG MAPS, PNN AND FUZZY LOGIC
02. Algorithm on vision-based detection with Color Co-occurrence method with Masking the green-pixels.
03. SVM classifier with Color co-occurrence method .
04. Feature extraction by Gabor filter and classification by ANN classifier.
05. Texture segmentation by using K-means Clustering Technique and co-occurrence matrix method .
06. The metodof color co-occurrence texture analysis is developed by using Spatial Gray level Dependence Matrices.
07. Triangle thresholding, Simple threshold and segmentation methods
08. Homogenization techniques Sobel and Canny edge detection segmentation, HPCDD Algorithm.
09. Otsu segmentation, K-Means clustering & Neural Network.

IV. CONCLUSION

Efforts have been made to study various techniques for detection of leaf disease. This paper focus on the research study conducted by various researchers. Accuracy and speed are the main characteristics of disease detection.so many research works have been carried out in the improvement of accurate ,efficient, automatic and fast mode of disease detection. More research work is needed for development this work in neural networks. so that more perfection and accuracy in leaf disease detection can be achieved.

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