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Novel Detection of Unhealthy Plant Leaves Using Image Processing Technique

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Abstract: Disease Detection of plants plays an important role in the farm related field on which we need to focus more. If proper care is not taken in this area, it may lead to serious effects on plants and negatively affects the productivity and quality. Here an idea of detecting plant disease using image processing is being proposed.Image processing is used for find out affected area of leaf disease automatic detectinon using image processing techniques give quick and correct results. In this survey paper we have discussed existing image processing techniques for detection of plant leaf disease.

Keywords: Image acquisition, image pre-processing, feature extraction, classification, classifier

1. INTRODUCTION

Plant disease identification by visual way is more difficult job and at the same time less accurate and can be done only in limited areas. Whereas if automatic detection way of doing things is used it will take less efforts, less time and more accurate. In plants, some general sickness are brown and yellow spots, or early and late burn, and other are fungal, viral and bacterial diseases. Image processing is the way of doing things which is used for measuring affected area of disease, and to figure out the difference in the color of the affected area. There will be great importance for the green production safety through using the computer image processing technology to watch leaf, in order to gain artificial intelligence prevention. Usually farmers identify the diseases by naked eye observation method. In this method disease is visually detected by the experts, who have the ability to detect small changes in leaf color. Some researchers have used image processing techniques for fast and accurate detection of leaf sicknesses. The steps followed in detection of leaf diseases are image acquisition, image Pre-processing, disease spot segmentation, feature extraction and disease classification. The quality of being very close to the truth value of result depends on methods used for disease spot detection. Image segmentation is the process of dividing an image into different parts. This is used to identify related information in digital images. In order to carefully study the plant leaf diseases, there is a need to fetch the features of these images, which include division of something into smaller parts.

2. LITERATURE SURVEY

In this section describes various approaches for detecting the disease in plant leaf using image processing technique

Pro. Sanjay B. Dhaygude & Mr. Nitin P Kumbhar & et… [1] There are four steps within the system design, 1st is produce a color transformation structure for a captured RGB image, HSI (Hue Saturation Intensity) is employed for color descriptor. The second Step is, inexperienced pixels are cloaked and take away by exploitation threshold worth. within the third step by exploitation threshold worth, helpful segments are obtained, whereas image segmentation is completed. And in last step segmentation is completed.

Vijayi Singh, **Prof. A K Misra & et… [2]** Image segmentation is finished by mistreatment genetic formula. Separating or grouping a picture into completely different components is Image Segmentation. resolution for optimisation issues ar created by genetic algorithms thatbelongs to organic process algorithms. The formula begins with set of resolution known as a population. mistreatment terribly less machine efforts the optimum results were obtained, that conjointly shows the potency of genetic formula in recognition and classification of plant disease. The disease are often known at early stage or initial stage, another advantage of mistreatment this methodology. this kind of classifier formula is a smaller amountcomplicated to grasp and simple implementation

Rajneet kaur & et.[3] A Brief Review on Plant Disease Detection using in Image Processing proposed by Rajneet Kaur et al, International Journal of Computer Science & Mobile computing. Use computer algorithm to perform image processing on digital pictures using this computer algorithm. It might avoid issues like build-up of noise signal distortion throughout process there are fungal, bacterial diseases caused by insects and nematodes on plant. Fuzzy classifier, Color analysis, Feature based rule, KNN these techniques are used for overall system of detection of plant disease.

Sujatha Rt. & et… [4] Leaf disease detection using image processing, Journal of Chemical and Pharmaceutical Sciences describes that feature extraction is done in RGB, HSV and YIQ .The diseases of different plant has mention. Classification is done for few diseases k-Means clustering is used for segmentation. It will divide leaf pixels into different clusters. This approach can significantly support an accurate detection of leaf disease

Sushil R. Kamlapurkar & et… [5] Detection of Plant Leaf Disease Using Image Processing Approach. They provide survey on plant plant disease detection victimization image process techniques. unwellness in crops causes important reduction in amount and quality of the agricultural product. Identification of symptoms of unwellness by eye is troublesome for farmer. Crop protection particularly in massive farms is finished by victimizationcomputerised image process technique which will sight unhealthy leaf victimization color info of leaves. looking onthe applications, several image process techniques has been introduced to unravel the issues by pattern recognition and a few automatic classification tools. within the next section this paper presents a survey of these plannedsystems for meaty manner. There ar several strategies in machine-controlled or pc vision for unwellness detection and classification however still there's lack during this analysis topic. All the unwellness can't be known victimizationsingle methodology.

H. Sabrol & et ..[6] Tomato Plant Disease Classification in Digital Images using Classification Tree, International Conference on Communication on Signal Processing proposed by H. Sabrol. To achieve automatic plant disease identification and diagnosis based on image processing. The Otsu's segmentation applied on image database. Total 10 times the images are randomly used for training and testing purpose. Feature extraction is done with features of leaf like color, shape and texture features. The classification tree is non parametric supervised learning technique is used. In this paper supervised learning techniques is used for learning purpose to classify the tomato plant leaves into six classes healthy and unhealthy that is five types of disease due to fungal, bacteria and virus. The combine features included color, shape and texture features extracted both type of plant images. The classification result showed that classification tree is resulting good accuracy.

Savita N. Ghaiwat, Parul Arora & et… [7] Detection and Classification of Plant Leaf Diseases Using Image Processing Techniques. Developed an automated classification system based on the morphological changes caused by brown spot and the leaf blast diseases of rice plant. To classify the diseases Radial distribution of the hue from the center to the boundary of the spot images has been used as feature by using Bayes' and SVM Classifier.

H.AI-Hiary et… [8]Fast and Accurate Detection And Classification Of Plant Diseases .Defines the three methods of Leaf Disease detection Identify the affected part of leaf by using k-means clustering, solve the affected part of leaf by using color co-occurrence method for texture analysis, to classify the type of disease by neural Network.Coverted the RGB image to HSV for texture analysis use the SGDM matrix for image formation. At last execute the solution by Neural Network. The advantage of these System it tested upon the wide range of disease and give good results. Demerit is it could be improved to increase the recognition rate of classification.

P.Revathi, M.Hemalatha& et … [9] This Proposed work is based on image edge detection the way of doing things in which, the clicked images are processed for making better first. Then R,G,B color Feature image segmentation is carried out to get targeted areas .later ,image features such as edge-related, shape, color and texture are pulled out for the diseases spots to recognize sicknesses and control the pest recommendation. In this research work consist three parts of the cotton leaf spot, cotton leaf color divide into smaller parts, edge detection-based image segmentation, analysis and classification of disease.

Gautam Kaushal, Rajni Bala & et… [10] In this paper they were doing image processing for plant disease detection, conversion of image into digital format, on this converted image they applied texture feature extraction segmentation, and classification texture feature extraction GLCM algorithm is applied. In existing algorithm they applied SVM classifier, according to their drawbacks of SVM, SVM is replaced by KNN, So that accuracy of disease detection is increased.

Khirade et.…[11] In this Proposed System Segmentation and Feature extraction set of computer instructions are discussed that can be used for the detection of plant Sicknesses by using the image of leaves. It is very hard to detect the plant Diseases manually due to needed things of too much time, knowledge of plant Sicknesses and much amount of work. Author divided the all process of plant leaf sicknesses detection in five steps:Image Acquistion,segmentation,Feature Extraction and classification of leaf diseases. Segmentation is done for separating of image into different feature parts using K-means clustering, Otsu filter.

Rothe et ... [12] has planned pattern recognition techniques for the detection and classification of cotton leaf diseases of Alternarnia, Myrothecium and microorganism Blight. The dataset pictures square measure taken from the sector of Central Institute of Cotton analysis Nagpur. Active contour-based segmentation formula is employed for the isolation of morbid spots. Author has additionally recommended some feature directions to the similar construct for the crops of wheat, orange, citrus and maize etc.

ABDOLVAHAB EHSANIRAD and SHARATH KUMAR Y. H. & et… [13] has planned a system to classify the plants by applying on the leaves pictures. To extract the leaves texture options, the (GLCM) and Principal part Analysis (PCA) algorithms are used. The classification of leaves is finished by exploitation Eigenspace. The Algorithms area unit trained by 390 leaves to classify thirteen varieties of plants with sixty five new or misshapen leaves pictures. The result indicates that the accuracy for the GLCM technique is seventy eight whereas the accuracy for the PCA technique is ninety eight.

Niket amoda, bharat jadhav, smeeta naikwadi & et… [14] In this research, plant diseased is detected and is also classified. The histogram matching is based on the color feature and the edge detection technique. The color features

extraction is applied on samples that are contained the diseased leaf of the plant. The training process includes the training of these samples by using layers separation technique which separates the layers of RGB image into red, green, and blue layers and edge detection technique which detecting edges of the layered images.

Khot.S. T, Patil Supriya , Mule Gitanjal & et… [15] In this paper, a real time image processing based approach for the disease on pomegranate is proposed. First image acquisition is takes place then pre-processing, segmentation, feature extraction techniques are used for detection of diseases. This system is useful for farmers to earlier detection of diseases on pomegranate. It is also useful for increasing the yield.

Anant Bhardwaj1,Manpreet Kaur2,and Anupam Kumar1& et… [16] In this projected System mentioned an automatic system for plant identification victimization form options of their leaves. it's been found that four parameters that area unit space convexity, volume fraction, moment invariant, inverse distinction moment, offer higher results. It is a possible various for classifying structurally complicated pictures. They offer exceptional unchanging options and reveal increased performance than alternative moment-based solutions. The experimental results explained that the projected methodology is effective. However, another works are explored to get higher performance.

M. M. Mokji and S.A.R. Abu Bakar & et… [17] In this planned System to induce higher thresholding technique supported grey level co-occurrence matrix (GLCM) is employed to handle pictures with fuzzy borders. The GLCM offers info on the distribution of grey level amendment frequency and edge info, the brink price is calculated. during this Set of laptop directions is meant to possess flexibility on the sting definition so it will handle the fuzzy borders. By dominant info within the GLCM, a applied math feature is formed from to act because the threshold price for image segmentation method

Prof. R. N. kadu et al. Int. Journal of Engineering Research and Applications & et… [18] In this planned System image process technique is employed to mechanically observe the signs of the illness. There square measure some stages to search out the illness like image acquisition, preprocessing on image, color rework exploitation YCbCr, segmentation by Otsu methodology, feature extraction by physicist filter methodology and classification exploitation SVM, exploitation those steps will certainly observe the illness and classified it and can also take serving to prevent one thing dangerous before it happens measures.

Jayaprakash Sethupath & et… [19] In this Proposed System author examine the diseases of mango leaf.The K-means algorithm is used for the disease segmentation, and SVM classifier is used to identify Sicknesses of leaf.

(1) identification of disease using the OpenCV and (2) Leaf shape-based disease identification.

Mr. Hrishikesh P. Kanjalkar, Prof. S.S.Lokhande & et… [20] Proposed a solution for leaf features uses for disease detection From the Hue image from HSI gives clear different treatment based on skin color,age etc. of diseased spots, and it is very useful for pulling out or taking from something else size, color and centroids. This proposed paper presents some important features of diseased leaves which will help to find exact disease of plant leaf. In paper total 10 features are taken in that 8 color features ,size diseased spot size, distances of diseased spots from each other.

Jing YI Tou, Yong Haur Tav, Phooi Yee Lau & et… [21] Studied the ways of image process. The native Binary Pattern (LBP) could be a texture extraction technique that used for label the elements of a picture by threshold the neighborhood of every pixel and provides binary range. it's attainable to check pictures in difficult time period settings because of its procedure simplicity, it. LBP is generally used for texture segmentation issues, it's additionally accustomed calculate native options.

M. Z. Rashad, B. S. el-Desouky,and Manal S. Khawasik & et… [22] In this proposed system Author describes a new,interesting approach for classification of plants which was based on the description of texture properties. They have used a combined classifier learning vector quantization along with related to lines coming out from the center of circle basis function. The proposed systems ability to classify and recognize a plant from a small part of the leaf is its advantage is giving thing. Without needing to depend either on the shape of the full leaf or its color features, one can classify a plant having only a portion available that is in itself enough as the proposed system needed only textural features. This system can be useful for the people who work to find information of study of plant who need to identify damaged plants, as it can now be done from a small available part. This system is mostly related as the combined classifier method produced high performance far superior to other tested methods as its correct recognition n rate was 98.7% which has been showed in the result.

Jyotismita Chaki and Ranjan Parekh & et… [23] Studied the Color image of leaf is converted to gray scale image because variety of changes in atmosphere and season cause the color feature having low reliability. This way it is better to work with gray scale image. Once image is converted to gray scale it is broken into parts from its background and then converted to binary and performs image smoothing over its image is pre-processed to improve the important features. This step added gray scale conversion, image segmentation, binary conversion and image smoothing. The aim of image pre-processing is to improve image data so that it can hold down and stop.

Kutty & et… [24] This System has used the neural network-based system to classify the watermelon leaf sicknesses of Downey Mildew and Anthracnose. This System has calculated the true positive rate, true negative rate and overall quality of being very close to the truth for the efficiency of the proposed idea This classification is based on the color feature extraction from RGB color model which is got from the identified pixels in the region of interest. All performance is shown with ROC curve having AUC value of 0.5. The true classification result also shows the value of 75.9%.

Syed Thousif Hussain [5]-2012 & et… [25] Author projected the approach that is employed to make a high range object category. this type of questioning the item raise several queries all variety of object and knowledge connected with it. It offers the output supported the rerank of image and its object category. 1st it downloads all the connected pictures and therefore the sites. Then on extracting options it tries to seek out out the reality regarding the downloaded page. and place it within the info and so ranking is finished supported text encompassing and descriptive options.

Ashis Pradhan & et… [26] This paper presents a associated with ideas concerning however things work or why they happen .The facet of SVM, its ideas and its applications outline. Support Vector Machine (SVM), is one in all best machine learn algorithms, that was planned in 1990's and used principally for pattern recognition. This has additionally been applied to several pattern classification issues like image recognition, speech recognition, text separation and labeling, face detection and not operating properly card detection, etc. Pattern recognition aims to classify information supported either a judgement before doing one thing data or associated with study info extracted from information, that could be a powerful tool in information separation in several fields of studies. SVM could be a supervised kind of machine learning. rule during which, given a collection of coaching examples, every marked as happiness to at least one of the numerous classes, associate degree SVM coaching rule builds a model that describe a doable future event the class of the new example. SVM has the larger ability to generalize the matter, that is that the aim of applied mathematics learning.

Prof. Bhavana Patil1, Mr. Hemant Panchal, Mr. Shubham Yadav , Mr. Arvind Singh, Mr. Dinesh Patil& et… [27] Author state that the image during this project, the detection as wells the fix for diseases for activity it's a gained with effort. This project uses GSM to send the message to each reasonably mobile phone. This project uses totally different image process ways in which of doing things which give correct results

Priyanka G. Shinde, Ajay K. Shinde, Ajinkya A. Shinde, Borate S. P& et… [28] - paper discussed a system using raspberry PI of plant disease detection. For the image analysis, the k-means clustering set of computer instruction was used. In drug-based research of leaf disease detection is necessary and important topic for research because it has advantages in supervising crops in field at the form and so it automatically detects signs of disease by image processing by k-means clustering algorithm. This paper provides the best method for detection of plant diseases using image processing and alerting about the disease caused by sending email, SMS and displaying the name of the disease on the monitor display of the owner of the system. To upgrade farming-based products, automatic detection of disease signs in sicknesses is useful. The design and use of these technologies which is totally automatic and it will significantly help in the chemical application. It will reduce the cost demanded for the bug killing chemicals and other products. This will lead to increase in working well and getting a lot of the farming.

Ana Carolina Quintao Siravenha & et..[29] This work presents a plants classification by victimisation time-frequency decomposition of leaves contour. There area unit 3 main step one. information samples and dataset,2.Analysis Techniques and three.Learning and Classification. within the opening move Flavia info is employed then in second step normalized Fourier remodeled vector is employed to creating form descriptor vector and in last Learning and Classification step the options area unit send to the training method and classification is finished on it victimisation random forest, rotation forest and feed forward neural network.

Arti N. Rathod& et..[30] Here author represents that in farm fields analysis of automatic leaf sicknesses of detection is extraordinarily vital. Here the author describes that in farm connected analysis of automatic plant disease detection is extraordinarily vital in direction giant fields of crops, then on mechanically observe signs of sickness as shortly as they seem on plant leaves. The term unwellness is sometimes used just for destruction of live plants. Here, completely different ways studies square measure for increasing output and reduction.

Samuel E. Buttrey et...[31] Construct a hybrid classifier by combining the 2 classifiers in common one classification trees and a couple of k nearest neighbour (KNN). Divide the feature by a a classification rule that performs higher than either trees or the same old KNN in a very variety of well-known knowledge set. live the space through check set item to every of the coaching set things, noting the k coaching set things that area unit nearest. the most characteristics of sickness detection area unit performing on the event of automatic, efficient, quick and correct sleuthing of unhealthy leaf.

Gurpreet Kaur & et..[32] authors proposed system is made up of 4 modules, 1) image acquisition, 2) image preprocessing, 3) image recognition and 4) result. image acquisition of leaf image is captured by using digital camera.Various image processing techniques are applied in image preprocessing this for preparing a leaf image for the feature's extraction process. features are extracted from image and classify it. In the display result recognition results is shown.

P. Mohanaiah , P. Sathyanar & et…..[31] Feature Extraction could be a used for capturing the visual content of pictures for retrieval.extraction of color, texture and form or domain specific options. This paper presents grey level co-occurrence matrix (GLCM) to extract second order applied math texture options of pictures. The options specifically, Angular moment, Correlation, Inverse distinction Moment, and Entropy area unit computed exploitation Xilinx FPGA.

Md Nazrul Islam & et.[34] proposed a system for detective work diseases on Lycopersicon esculentum i.e. early scorch, late scorch and leaf spot on the Lycopersicon esculentum with the assistance of PNN i.e. Probabilistic Neural Network and also the GLCM feature together with mathematical logic. that makes this technique valuable, correct and small process effort. however the popularity rate varies for the dynamic image acquisition and additionally needed additional learning time got to maintain large leaf

Padao & et...[35] here analysis aims to review plant classification mistreatment Naive Thomas Bayes (NB) technique. leaf form and texture is input options of the model classifier. The take a look at result shows that the classification quality of being terribly about to the reality of the model is high that true positive rating is superb and therefore the weighted average of the false positive rating is 0.09%, that is rigorously considered little or no acceptable

Ghulam Mustafa Choudhary& et..[36] Author represent the photographs of 2 class i.e. spot and scorch. For the coaching of the Feed forward neural network and Radial basis operate neural network. classification extracted color, texture and geometric options is employed. And for classification thee Classifier Feed Forward Neural Network is employed.

3.TABLE

Sr.No.	Year	Authors	Techniques	Advantage	Disadvantage
1	2013	Prof.S.B.Dhaygude, N.P.Kumbhar	HSV, Color Transformation Structure, Segmentation	HSV good color descriptor	Recognition rate of classification is low
2	2015	Vijay Singh, Prof.A.K.Misra	Genetic Algorithm	Disease can identify at initial stage optimum results	Only 10 species can be identified
3	2017	Rajneet Kuar	SVM ,KNN,Fuzzy Classifier	KNN classifier gives highest result	SVM is too complex for calculation
4	2017	Sujatha R, Y Sravan Kumar	K means clustering, SVM, Feature Extraction	Low in cost easy to rectify the disease	Accuracy can be improved
5	2016	Sushil R. Kamlapurkar	Gabor Filtering, ANN	Detecting the disease at early stage	Need to extract features according to the disease
6	2016	H.Sabrol,K.Satish	Greedy algorithm, supervised learning, classification tree	Classification tree is resulting good accuracy	Only focuses on Tomato plant
7	2014	Savita Ghaiwat,Parul Arora	KNN, Fuzzy logic, ANN, SVM	Prediction accuracy of SVM is high	SVM involves long training time
8	2010	H.AI-Hairy,S.Bani-Ah Mad	K means, SDGM matrix, color cooccurrence method, HSI, Neural network	Accurate detection of disease in little computational efforts	Recognition of hybrid algorithm is less
9	2014	P.Revathi and M.Hemalatha	HPCCDD	Reduce the production loses	Accuracy can be improved
10	2017	GautamKaushal, RajniBala	GLCM, KNN, K means	SVM is slow so replace by KNN	Success ratio is low
11	2015	Sachin D. Khirade and A. B. Patil	K means, HIS, Otsu thresholding,	In ANN, for classification of disease self-	Accuracy can be improved

			color concurrence method, ANN	organizing feature map back propagation algorithm is used	
12	2015	Rothe, P. R., and R. V. Kshirsagar	Active contour-based segmentation	Active contour-based segmentation gives disease spot	Only focuses on Cotton Leaf
13	2010	ABDOLVAHAB EHSANIRAD and SHARATH KUMAR Y. H	GLCM, PCA	PCA method has more accuracy 98.46 over the GLCM	GLCM has less accuracy 78.46 as compared as PCA
14	2014	Niket Amoda, Bharat Jadhav, Smeeta Naikwadi	K means, Color concurrence methodology	For training process various layers separation technique are used to separate the RGB image	Large database complex to handle
15	2016	Khot.S. T1, Patil Supriya , Mule Gitanjali	Gabor filter, HSV, YCBbCr	Real time image processing-based approach is used	It is only used for crops
16	2013	Anant Bhardwaj1, Manpreet Kaur2, and Anupam Kumar1	PNN, PCA, Neural network	Area convexity, volume fraction, moment invariant, inverse difference moment provides better result	Less correct recognition rate
17	2007	M. M. Mokji and S.A.R. Abu Bakar	GLCM, fuzzy boundaries	Good segmentation result	Only one featured extracted i.e. entropy so accuracy is less
18	2015	Prof. R. N. kadu	Gray Scale, SVM, gabor filtering	SVM prediction accuracy is	SVM classifier involves long training data,

				high, SVM does not depend on input space dimensionality	Large number of support vector used to perform classification task
19	2014	Jayaprakash Sethupathy	SVM, HSI, K means	OpenCV implementation provide easy availability. Low cost	It has need to carry the robotic arm
20	2014	Mr.Hrishikesh P. Kanjalkar, Prof. S.S.Lokhande	Texture Classification, Computer Vision, Machine Learning	HSI gives clear discrimination in diseased spots	Accuracy can be improved
21	2009	Jing YI Tou, Yong HaurTav, Phooi Yee Lau	GLCM, local binary pattern, gabor filter, ANN, SVM	Trend of classification methods and filtering methods are explained	
22	2011	M. Z. Rashad, B. S. el-Desouky,andManal S. Khawasik	Texture based feature, radial basis function Learning vector Quantization (LVQ),	Used texture features to obtained exact feature of image, recognition rate 98.7	Recognition rate can be improved
23	2012	JyotismitaChaki and Ranjan Parekh	Moment invariant, centroid radii	Different shape modeling techniques are used, low complexity	
24	2013	Kutty, SuhailiBeeran, Noor Ezan Abdullah, HabibahHashim, and Aida Sulinda	Neural network	Total result is value 75.9	Focuses on only Watermelon leaf
25	2012	Syed thousifhussain B.N.Kanya	Data mining	Provide sort of information	Inaccurate information
26	2012	Ashis Pradhan	SVM	Prediction accuracy of SVM is high	SVM involves long training time

27	2017	Prof. Bhavana Patil,Mr. Hemant Panchal, Mr. Shubham Yadav , Mr. Arvind Singh, Mr. Dinesh Pati	GLCM, GSM, formatting	User interactive, utilize GSM to send message	Raspberry Pi packages issue
28	2017	Priyanka G. shinde, Ajay K. Shinde, Ajinkya A. Shinde, Borate S. P	GSM, K means, SGDM, GLCM, KNN	Various types of leaf diseases can identify, Accurate, High speed, Save labor prize	
29	2015	Ana Carolina QuintaoSiraven Ha	Shape Features, fourier transform, feature selection	Fourier transform for automatic plant identification and classification, Gives highest accuracy	correct recognition rate is low
30	2013	Arti N. Rathod, BhaveshTanawa l, VatsalShah	Image Processing	Image analysis	
31	2012	Samuel E. Buttrey	KNN, Classification tree	Performance of classifier is analyze using confusion matrix	Accuracy is not enough
32	2002	Gurpreet kaur	GLCM, Gray Level	Classification tree is used to divide the feature space	Not useful for large database
33	2013	P. Mohanaiah P Sathyanarayana , L. GuruKumar	Pattern recognition, Features, Frames.	high discrimination accuracy, requires less computation time	resources required a large set of data accurately
34	2004	M. N. Islam, M. Kashem, M. Akter, and M. J. Rahman	Genetic algorithm, neural network	Genetic algorithm is optimization technique use as a problem-solving strategy	Dynamic Image acquisition, the recognition rate is low

35	2015	Francis Rey F. Padao and Elmer A. Maravillas	Naïve Bayesian, Probabilistic Classification, Supervised Learning.	Classification accuracy model is high	True positive rating and weight average for falls positive rating is 0.09
36	2015	Ghulam Mustafa Choudhar y, Vikrant Gulati	Feed Forward Neural Network Radial Basis Function Neural Network	automatic, fast and accurate developmentus e of detection disease on unhealthy leaf.	require more data than traditional Machine

4.CONCLUSION

The main approach is to recognize the diseases. Speed and accuracy are the important characteristics required for disease detection. Hence, the extension of this work will focus on developing a system based on existing algorithms for fast and accurate detection of leaves with disease. Using very less computational efforts the optimum results will obtained which also shows the efficiency. From this survey, in future work we will focus on texture based feature extraction, GLCM, K means clustering, SVM as classifier as Image Processing techniques.

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