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Plant Disease Detection using SVM Algorithm and Neural Network Approach

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ABSTRACT: The agriculture industry aims at providing the eclipse of the nature of the industry which boomed with its spheres of technology and the invasive methods which carve out the nature of the industry which pertains the disease detection approach towards the image processing and back propagation algorithm detection and the field to study about the SVM model , PCA model , SVD model .This model enhances about the tradition of disease detection with its Support analysis and Principle Component Analysis which makes up the leaf detection process to know more in areas of the new and advaced methodology .

KEYWORDS: Image Processing, Back Propagation, SVM, PCA, SVD.

I. INTRODUCTION

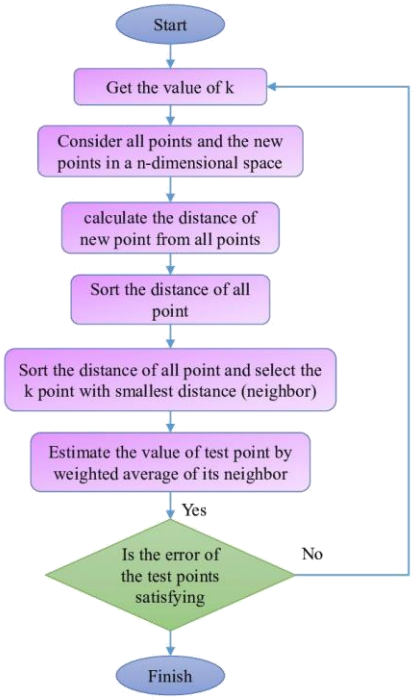
Image processing is the process of enhancing a 2D image into digitizing of co-ordinates into amplitude values .Image processing studies about the digitizing of coordinate values and its amplitude . Image processing enhances about the coordinate images of leaf disease detection . This process is a combination of Machine learning and image processing . Basically the foliar disease is an example of the vertical which lays down the parameters of the neural network approach and back propagation algorithm .

Back propagation algorithm defines the study about the neural network approach which guides us about the leaf major diseases pertaining to the diseases which helps in carving out the neural network approach which helps in the disease detection of the foliar which is a method of the carrying feed - forward and backward hidden units expressed in Markov model .

II. LITERATURE REVIEW

Leaf disease detection helps in identifying the study of the foliar disease which helps in surveying about the K-nearest algorithm .K- nearest algorithm clusters about the nature of the supervised learning which makes up with the identification of the new advent of machine learning expressed in the nature of the association of leaf disease detection

[3]philosophy for identifying plant diseases early and precisely, utilizing different image processing techniques and counterfeit neural network (ANN). The framework created here is for plant diseases acknowledgment, the advancement of good classification techniques and exact components is critical keeping in mind the end goal to run the framework continuously. In this way proposed approach which depends on Gabor channel for highlight extraction and ANN classifier for classification showed signs of improvement results and acknowledgment rate up to 91%. An ANN based classifier is embraced which utilizes the mix of shading and surface components to perceive and characterize distinctive plant diseases. The outcomes are empowering and guarantee the advancement of a decent machine vision framework in the zone of acknowledgment and classification of plant diseases.

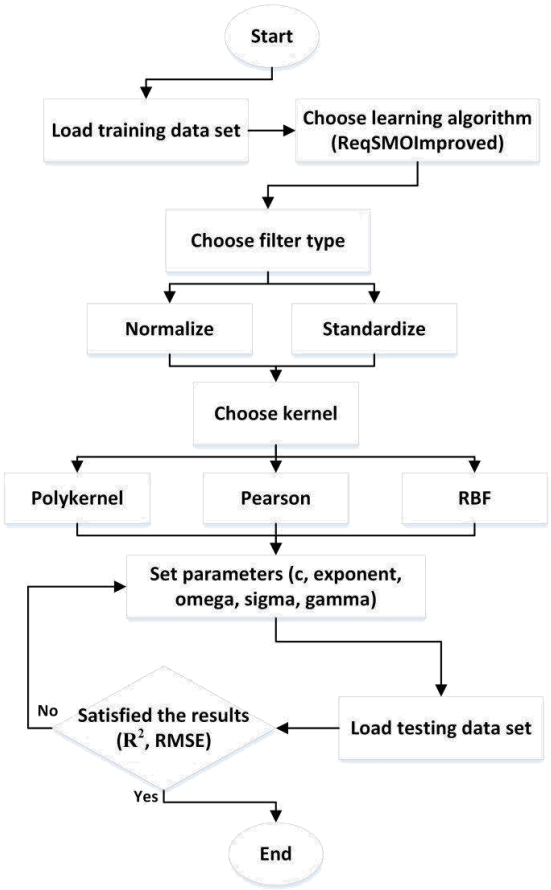


In [4] a system to perceive the disease of two plants. This examination has been done on two grapes plants and two wheat plants to enhance exactness utilizing image processing techniques

the optimal acknowledgment results for grape diseases were gotten as the fitting precision and the expectation exactness were both 100% and that for wheat diseases were acquired as the fitting exactness and the forecast exactness were both 100%. While the measurements of the element information were lessened by utilizing PCA, the optimal acknowledgment result for grape diseases was acquired as the fitting exactness was 100% and the forecast precision was 97.14%, and that for wheat diseases was gotten as the fitting exactness and the expectation precision were both 100%.

In [12] authors examined about the noisy image and connected Adaptive median filter to expel noise from the image and gives output as a filtered image. The evaluated Error and average error of the qualities put away in filtered image matrix have been ascertained with reference to the qualities put away in unique information matrix with the end goal of checking of appropriate noise expulsion. Presently information of every pixel has been changed over into binary number (8 bit) from decimal qualities. This procedure keeps on creating new information matrix with new distinctive arrangement of qualities. This information matrix has been taken as unique information matrix and spared in information bank. Presently for acknowledgment, another test image has been stepped as salt and pepper noise insertion, evacuation of noise utilizing adaptive median filter as specified before have been connected to get another test matrix.

In [7] authors depict the investigation on plant diseases which are obvious by the naked eye and effortlessly perceptible. Creepy crawlies assumes real part to damage nay crop or plant. The pesticides and bug sprays are not



III. PROPOSED TECHNIQUE

There are three types of algorithm which will be used in the proposed methods.

Back-propagation Algorithm (BPA): The backpropagation algorithm **performs learning on a multilayer feed-forward neural network**. It iteratively learns a set of weights for prediction of the class label of tuples. A multilayer feed-forward neural network consists of an input layer, one or more hidden layers, and an output layer.

Principal Component Analysis (PCA): Principal Component Analysis is an unsupervised learning algorithm that is used for the dimensionality reduction It is a statistical process that converts the observations of correlated features into a set of linearly uncorrelated features with the help of orthogonal transformation. These new transformed features are called the **Principal Components**. It is one of the popular tools that is used for exploratory data analysis and predictive It is a technique to draw strong patterns from the given dataset by reducing the variances.

PCA generally tries to find the lower-dimensional surface to project the high-dimensional data.

PCA works by considering the variance of each attribute because the high attribute shows the good split between the classes, and hence it reduces the dimensionality. Some real-world applications of PCA are ***image processing, movie recommendation system, optimizing the power allocation in various communication channels.*** It is a feature extraction technique, so it contains the important variables and drops the least important variable.

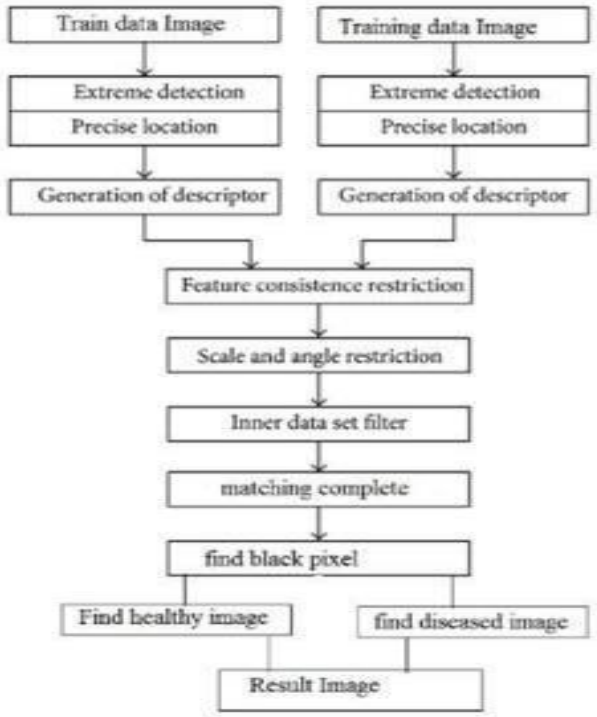


Figure 1 Flow Chart

from Green color that is shown in black color pixel after that it will show healthy or diseased image based on black pixel or spot image. Then result image is declared.

IV.EXPERIMENTAL RESULTS

As as aresult shown in figure which is an experiment of the dataset iris which is an occupied with the nature of the leaf diseased detection which plays an important role in the classification of the leaf either dicot or monocot which enhances the image of the datset s which clearly expresses the image of the leaves which provide the leaf disease detection which comes up with the mono-classification or poly classification leaves .

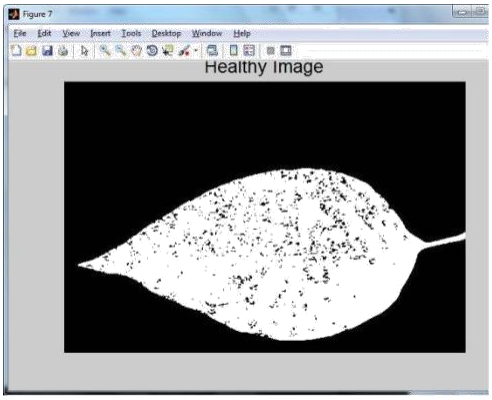


Figure 2 Healthy Part of leaf

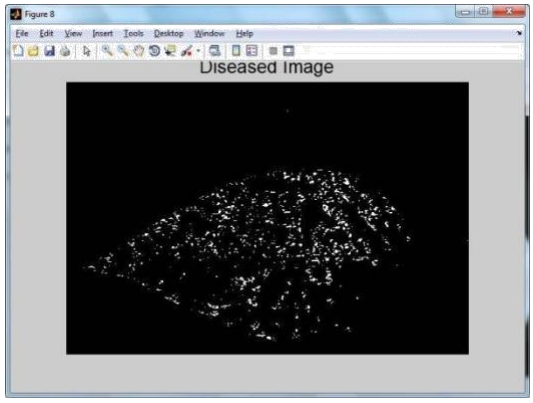


Figure 3 Diseased Part of leaf

As shown in figure 3, the images of the train folder will match with the images of the trained folder for the The black background from the leaf will be extracted to know that how much portion of the leaf will be cut.

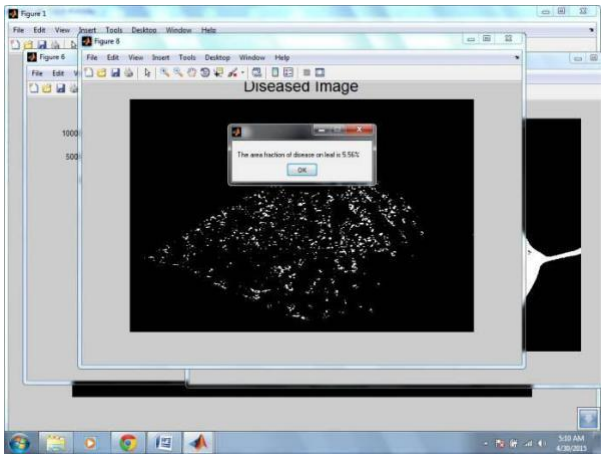


Figure 4 Area of Disease

V. CONCLUSION

The leaf detection methods using machine learning expresses about the nature of the leaf detection which combines with the support vector machine and the areas of the disease whether binary classification of the leaves with either healthy or non healthy .

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