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PLANT LEAF DISEASE DETECTION USING K-MEANS CLUSTERING

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Abstract- Agriculture is the form of productivity, which is the essential part to develop in the world. Even there are many project to develop every sector, there is no vast improvement in the agriculture farming sector. So the plant leaf disease detection application is to develop the agriculture sector and increasing the safety requirements so that the plant growth development can be developed. The aim of this project is to check the growth of every plants, in this how this project is used is they check the growth of the plants and in any case the plant affects while growing or getting disease, the project detects it and so that we can take some action to that problem. This is useful because when some plants affect it affects other plants also so that the good plants also get affected, and the development of agriculture farming also get affected. This work implemented using image processing technique and various filtering method, image segmentation, and classification of K-means clustering and detects the problem in leaf. This image detection can be classified by comparing good plants of default image comparison and gets efficient result by various method including in this project. This project also covers the different survey of detection take over in various analysis. This project work reduces the monitoring work towards the large scale agriculture form and the farming scale can get vast profit by this project. This project gives the quality product by not affecting the productivity source and economical profit of plants in the resource progress. Finally the plant leaf disease can maintain at lower mortality to increasing farming agriculture into a developed sector farming.

KEYWORDS: Image preprocessing, Gaussian, Biletral Filter, Edge Enhancement, Grey Scale Conversion, K-means.

I. Introduction

The project plant leaf disease detection starts by the image pre processing and system utilize size image to have high digital pixelization imaging capturing to send it to comparison. The main objective of this work is to make the system identifies the disease and gives a hint to the farmer, so that the farmer can infuse it and can give the correct pesticide to the plants and they can't be affected more. So that the plant affection can be come in to a control in a shot period of time. By the image processing technique the affects area in leaves. The image taken for comparison can be affected or not, but the image kept for default comparison should be perfect leaf without any disease or affected leaves. The farming can be in big scale so the images are can be taken in high pixel format and frequently sent to the system and the system frequently checks and compares the leafs to get the result of images compared. This system analysis can done by one person so no need more man power to implement it.

II Related Work

Zhang et al. [1] proposed an apple leaf disease recognition method that is based onimage processing techniques and pattern recognition methods. In the experiment, on an images (including classes: healthy apple leaf, powdery mildew leaf, mosaic leaf and rust leaf), this approach realized a recognition accuracy of more than 90%. In [8] the authors provided a fast, automatic, cheap and accurate image-based solution for the identification of leaf diseases. The proposed solution is composed of four main phases: a color transformation structure, image segmentation via the K-means clustering technique, calculation of the texture features and, finally, a pre-trained neural network for transmitting the extracted features. The experimental results demonstrated that the scheme could successfully detect and classify diseases with an accuracy rate of approximately 93%. and the segmented leaf image was analyzed by using a highpass filter to detect the diseased part of the leaf. In theexperimental part, common downy mildew, black rot and other.proposed an algorithm for classifying plant leaf diseases according to texture features. In the processing scheme, images were subjected to a color conversion structure and a segmentation mechanism. Finally, the extracted features were passed through a support vector machine classifier. The algorithm an accuracy of 94%. However, traditional machine learning extraction and classification steps it is easier to is based on convolution neural networks.In recent years, several researchers have studied plant disease recognition based on deep learning approaches. In [9], they trained a deep convolutional neural network to identify 14 crop species and 26 diseases

using a public dataset of 54,306 images. The trained model realized an accuracy of 99.35%. When tested on a set of images from online sources instead of the images that were used for training, the model still realized an accuracy of 31.4%. In, Ferentinos trained multiple CNN architectures, such as AlexNet, VGG and GoogLeNet, using an open database thatcontained 58 combinations of plants or diseases. The experimental results demonstrated that the most successful which realized a success rate of 99.53%. In [8], designed a new architecture of deep convolutional neural networks that was based on AlexNet for detecting apple leaf diseases. On a dataset that contained Mosaic, Rust, Brown spot, and Alternaria leaf spot, a recognition accuracy of learning to train CNNs to identify three diseases and two types of pest damage and the best model realized an overall accuracy of 93%. The main drawback of these studies is the use of image recognition technology that can only identify a single object at a time.The various technique have been carried out in this leaf detection by he region of detection by splitting of various process. The HIS color system has been used in the component H and segmentation process carried out to disease spot and leaf plants gives the disease spot reduction. In another case the grapes disease we can use the image compression and also the K-mean clustering been used to segment the affection of the image disease. The can be classified in also the bp network that is back propagation network in the detection of grape classification ,they also include the radial basis function (RBF). Neural networks, the categorized generalized regression network can be maintained to regret the data set image to form the clarified form of generalized source. The use of (PNNs) is been the process of grapes in the disease detection the network analysis in this process can be also similar zed in Farming culture to overused detection on the grape disease detection. The three level for stage frame work in the sugar beet leaf Disease detection. The segmentation index of g-r is introduced to distinguish leaf parts.

III. Proposed Work

Leaf classification system shown in Figure 1 is based on the following techniques.The feature that involves in leaf detection is first color based process so that the affected part can be viewed easy to analysis process of detection. The data set hasthe pre default images.The techniques used in detection for plant disease:BPNN, SVM, K-MEANS clustering analysis. This process is used for quality image process in the sequential farming industry. The centroid analysis do the processing of image scanning in the data set and gives the clusters apply the deep learning algorithm, the segmentation is better for getting the calculated values of leaf disease and the graph shows the image affected region so this gives the appropriate rate of detection and comes to range of detection.

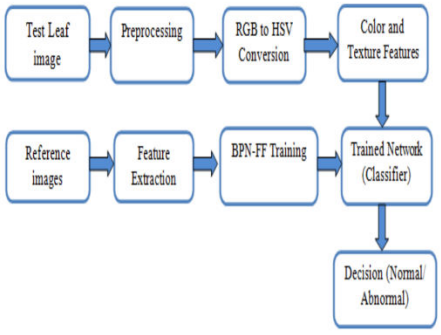

Figure 1.System Architecture

IVImplementation

The types of detection algorithm take place is the following techniques, The first step is to send the digital data set image to system for the analysis.

1. Gaussian Blurring.
2. Biletral Filter for edge enhancement.
3. RGB to grey conversion.
4. KMEANS Clustering.
5. Thershold For segmentation.

Gaussian blurring makes an a image blurred and result the image by the Gaussian function. It is mostly used in reducing the Noise in the graphical image. The visual of the translucent technique is to resemble the view image, this gaussian image is mostly used in the open cv to get the image in illumination. Gaussian image is similar to the convolving a two dimensional weierstrass transform. This Gaussian do the work of reducing the images high frequency. Bilateral filter for edge enhancement is the Smoothing filter for image. This bilateral do the work of distancing the pixels in the image and give the coordinated current Filtered image to the source of smoothing Difference and spatial closeness to the noteof the radio metric differences. RGB to grey code conversion has the color feature gray scale conversion gives the texture imaging process to the image that coverts the method to gray image and to progress in nest level of formation the total forming methods in the gray scale code conversion is average method and weight method or luminosity method. Then we see the K-means clustering that do the mathematical function to desired by the gray scale image into kmeans clustering the k clustering do the signal processing to the geometric median of minimize Euclidean distancing.The K-means clustering refers to Lloyd's algorithm. The k man clustering is the mathematical calculation graph that take in the situation for formation of observation to mean partitioning.The nearest k medoids have been assign to cluster analysis of randomly assigned points. The k-means clustering is most commonly the exploratory data that is similar to measure the basis of the image testing process and then cluster analysis take it over the another level of increment analysis. Clustering can do the customers similar result in the final output to the segmentation process to finalized format in the name of image algorithm. This K-means algorithm is a iterative algorithm and gives the point of attraction of data points of similar cluster the way means specify the centroid by first specific data analysis to the processing of imaging into the name called K-MEANS clustering method.

V Experimental Results

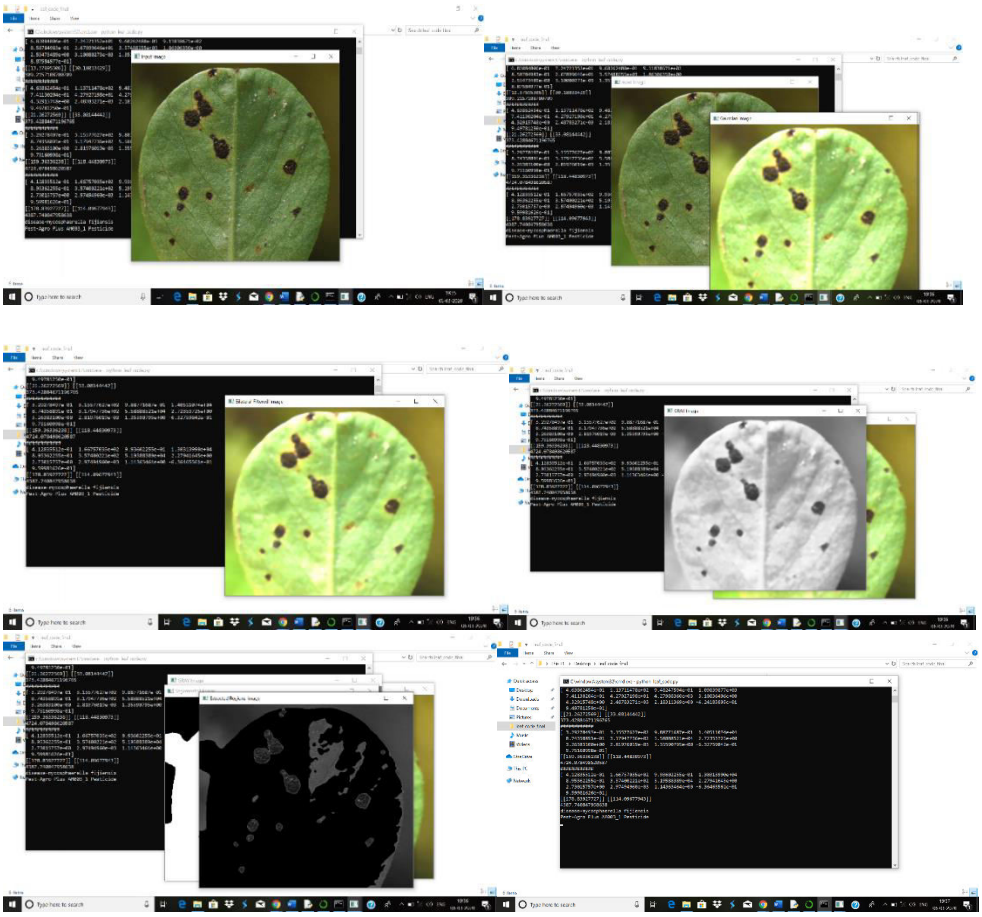

Figure 2. Output Modules

The images are the Figure 2, are the output results of the plant leaf disease detection this are the several extraction levels that input data under goes .First the input image is sent in to the system for analysis, then the image is extracted to the gaussian Blurring and undergoes noise reduction and then the extracted image from gaussian is send to bilateral image extraction, and then again the bilateral extracted image undergoes the RGB conversion and then finally the threshold edge segmentation image. Final extracted image is going to go process under the k-means clustering and calculation dome by the python compiling and results the disease affected the plant.

VIConclusion

The Plant leaf disease detection is very important process analysis that is very useful for the crop cultivation and development of the invest quality of crop by the process of few technique the project has been implemented to over come the difficulties in the crop cultivation the process may be the feature extraction of the images of the plant gives the good results of imaging analysis to the system. The project can also used in every form of sector in crop fields like ex mango separation, after mango cultivated there will be the mango color separations in the packaging in that way the we can implement this project and can use to sperate the mangoes by the color extraction this can done by connecting our project with machine learning and machine analysis to separate extractor frits. Thus all we need is just a few extraction algorithm and image processing techniques to excaudate the image process in the planning to develop the mechanism in the crop cultivation. Further in future more technology may be evolved and our project may be the base for it, just adding the two are more techniques algorithm in it. The future extraction of this project may conclusion of vast improvement in the analysis of development of agriculture farming, fruits, plants vegetable etc .That time the developments seek into the future scope to the upcoming generation development of this project and evolves many form of detection algorithm in future analysis program

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