VERSATILE PLANT DISEASES PREDICTION BASED SUPPORT VECTOR MACHINE IN DIITAL IMAGE APPLICATIONS

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ABSTRACT: In Agriculture, plant leaf diseases have grown to be a dilemma as it can cause significant diminution in both quality and quantity of agricultural yields. Thus, automated recognition of diseases on leaves plays a crucial role in agriculture sector. This paper imparts a simple and computationally proficient method used for plant leaf disease identification and grading using digital image processing and machine vision technology. The proposed system is divided into two phases, in first phase the plant is recognized on the basis of the features of leaf, it includes pre-processing of leaf images, and feature extraction followed by Clustering algorithm based training and classification for recognition of leaf. In second phase the disease present in the leaf is classified, this process includes different types methods based segmentation of defected area, feature extraction of defected portion and the svm based classification of disease. Then the disease grading is done on the basis of the amount of disease present in the leaf, the experiments shown that our proposed algorithm is effective by using mat lab.

KEYWORDS: Pre-Processing Image Segmentation, Classification, Image Accuracy.

1. INTRODUCTION

Leaf spot is a common descriptive term applied to a number of diseases affecting the foliage of ornamentals and shade trees. The majority of leaf spots are caused by fungi, but some are caused by bacteria. Some insects also cause damage that appears like a leaf spot disease. A symptom of plant disease is a visible effect of disease on the plant. Symptoms may include a detectable change in color, shape or function of the plant as it responds to the pathogen. Leaf wilting is a typical symptom of verticilium wilt, caused by the fungal plant pathogens Infectious plant diseases are caused by living (biotic) agents, or pathogens. These pathogens can be spread from an infected plant or plant debris to a healthy plant. Microorganisms that cause plant diseases include nematodes, fungi, bacteria, and mycoplasmas. Leaf spot is a condition caused by fungus and bacteria that result in dark, black splotches to form on the leaves of infested plants. These spots are mainly a cosmetic issue, but severe cases can be detrimental to the plants health.

Plant Diseases:
Disease fungi take their energy from the plants on which they live. They are responsible for a great deal of damage and are characterized by wilting, scabs, moldy coatings, rusts, and blotches and rotted tissue.

Anthracnose: Infected plants develop dark, water soaked lesions on stems, leaves or fruit.

Apple Scab: Scabby spots on fruits and leaves are sunken and may have velvety spores in the center.

Bacterial Canker: Common on cherries, peaches and plums, but may also affect other kinds of stone fruits.

Black Knot: Attacks plum, apricot, cherry and chokecherry trees -- both fruiting and ornamental.

Club Root: Infected plants in the cabbage family will have misshapen and deformed (clubbed) roots.

Damping Off: Occurs when old seed is planted in cold, wet soil and is further increased by poor drainage.

Downy Mildew: Symptoms appear as yellow to white patches on the upper surfaces of older leaves.

2. LITERATURE SURVEY

Study of digital image processing techniques for leaf disease detection and classification

In this paper, we address a comprehensive study on disease recognition and classification of plant leafs using image processing methods. The traditional manual visual quality inspection cannot be defined systematically as this method is unpredictable and inconsistent. Moreover, it involves are mark able amount of expertise in the field of plant disease diagnostics (physiopathology) in addition to the disproportionate processing times. Hence, image processing has been applied for the recognition of plant diseases. The paper has been divided into two main categories viz. detection and classification of leafs Fast and accurate detection and classification of plant diseases. The proposed solution is an improvement to the solution proposed in [1] as it provides faster and more accurate solution. The developed processing scheme consists of four main phases as in [1]. The following two steps are added successively after the segmentation phase. In the first step we identify the mostly green colored pixels. Next, these pixels are masked based on specific threshold values that are computed using Otsu's method, then those mostly green pixels are masked.

3. EXISTING SYSTEM:
THERSOLD REGION GROWING METHOD:

Nowadays, leaf diseases are one the main reason for increasing mortality among adults and kids. It's been concluded in the research of the majority of the western world that number of individuals who suffering and dying from leaf diseases. This technique has a great ability to detect differences in tissue and structures and is better than computed tomography for the detection of the size of the diseases in the leaf. A more classy and versatile approach will depend on thresholding which divides the image into two regions this forming a binarized image a depending on a typical threshold method for segmentation. Its gives the better segmented results over other traditional algorithms because threshold value is dependent on the inner cluster variance. A morphological filtering based approach of leaf diseases segmentation on images provides significant outputs through operations like erosion and dilation. It work over the binarized image for automatic region splitting dependant on region growing approach like automated seeded selection also for detection and extraction of diseases

4. PROPOSED METHOD

Agricultural production has diminished in both magnitude and excellence as well. For plants to cultivate rapidly and to boost crop output, leaves are decisive. Farmers and researchers a like struggle to find illnesses in plant leaves. At the moment, farmers spray pesticides on the plants, but this has an impact on humans either directly or indirectly in terms of health or even economics. There are plentiful swift methods that are cast off to perceive these plant infections. To identify the illnesses that are present in plant leaves using technology

4.1 K-MEANS CLUSTRING

K-Means Clustering is an unsupervised learning algorithm that is used to solve the clustering problems in machine learning or data science. In this topic, we will learn what is K-means clustering algorithm, how the algorithm works, along with the Python implementation of k-means clustering.

Algorithm:

1. Give the no of cluster value as k.

2. Randomly choose the k cluster centers

3. Calculate mean or center of the cluster

4. Calculate the distance b/w each pixel to each cluster center

5. If the distance is near to the center then move to that cluster.

6. Otherwise move to next cluster.

7. Re-estimate the center.

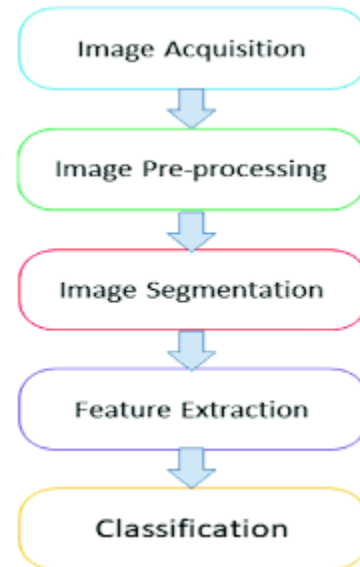8. Repeat the process until the center doesn't move

Fig 4: Proposed Method Flow Cart

SVM classifier algorithm with high precision, the author could attain results as opposed to the multilayer Perception procedure; the author's approach gives valid results. Compared to current system accuracy, the system architecture
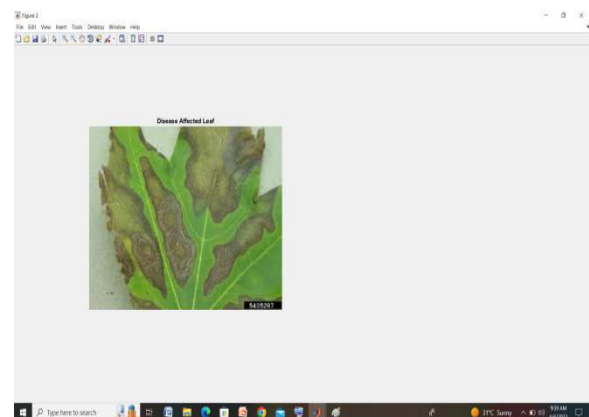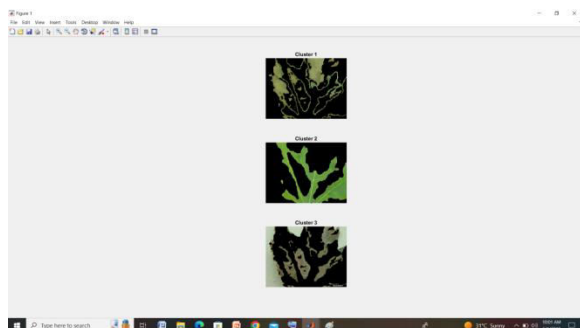
5. OUTPUTS

Fig 5.1: Input Image
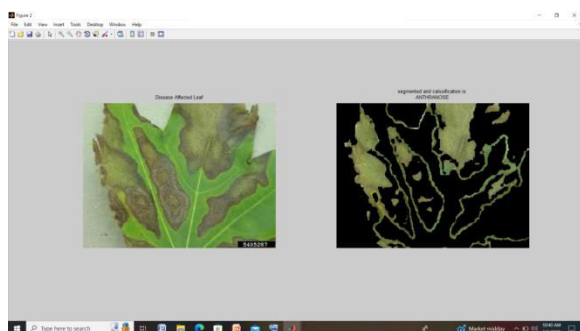
Fig 5.2: Clusters Division Using K-Mean

Fig 5.3: Output Leaf Damage Are Based On Name

6. CONCLUSION

This work gives efficient and accurate plant disease detection and classification technique by using image processing technique. K-means and GLCM techniques are used for plant leaf disease detection. This automated system reduces time of detection. It can help the farmers to diagnose the disease and take remedial action accordingly. In future work, we will extend our database for more leaf disease identification.

REFERENCES

[1] "Indian agriculture economy.". Available: http:// statistics times.com/economy/sectorwise-gdp-Contribution-of india.Php

[2] "Common rust in maize", Available: https://www.

pioneer.com/home/site/us/agronomy/library/ common-rust-in-corn/

[3] Indian Council of Agricultural Research" ,Available:https://www.apsnet.org/publicati ons/imageresource/Pages/Fi00158.aspx

[4] "family of trees", https:// plantvillage .psu. edu/ topics/ coconut/infos

[5]"Agropedia",Available:http://agropedia.ii tk.ac.in /content /papaya-diseases-its-control

[6] Prof.Sonal, P.Patil, Rupali, Zambre,"Classification of Cotton Leaf Spot Disease Using SVM," International Journal of Engineering Research & Applications", Vol.4,pp.92-97, May 2014

[7]https://worldofchillies.com/growing_chill ies/chilli_pest problems diseases/chilli diseases/chillidiseases.html

[8] Pragya Adhikari, Yeonyee Oh, Dilip R. Panthee" Current Status of Early Blight Resistance in Tomato: An Update," International Journal of Molecular Science", September 2017

[9] Akansha Pandey, Sanjeev Dubey," Evaluations of brinjal germplasm for resistance to fusarium wilt disease," nternational Journal of Scientific and Research Publications, Volume 7, Issue 7, July 2017

[10] Gittaly Dhingra, Vinay Kumar, Hem Dutt Joshi ,"Study of digital image processing techniques for leaf disease detection and classification," Springer-Science, 29 November 2017

[11] Shitala Prasad, Sateesh K. Peddoju, Debashis Ghosh ," Multi-resolution mobile vision system for plant leaf disease diagnosis," pp. 379–388, Springer-Verlag London 2015