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Survey: Detection Of Crop Diseases Using Multiscaling Technique

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***Abstract*—** Diseases in crops reduces both quality and quantity of the agricultural products.A classification is a technique where leaf is classified based on its different morphological features. Since the quality of result can vary for different input data, selecting a classification method is always a difficult task. There are different classification techniques such as K-Nearest Neighbor Classifier (KNN), Probabilistic Neural Network(PNN), Genetic Algorithm, Support Vector Machine(SVM) and Principal Component Analysis, Artificial neural network(ANN), Fuzzy logic. Plant leaf disease classifications have wide applications in various fields such as in biological research, in Agriculture etc. Farmers experience great difficulties in switching from one disease control policy to another. Early information on crop health and disease detection can facilitate the control of diseases through proper management strategies. This technique will improves productivity of crops. In practice the traditional approach for detection and identification of plant diseases is the nacked eye observation.

Keywords- Disease detection, Image Acquisition, preprocessing, Feature Extraction, Classification etc.

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I. INTRODUCTION

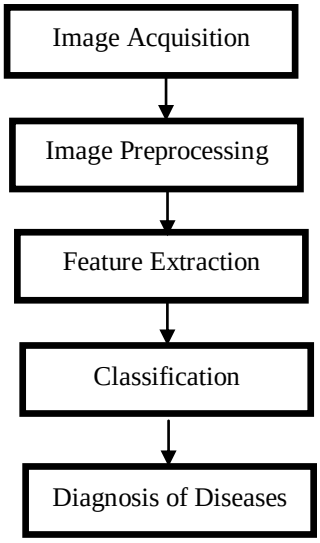
The aim of research in agriculture is to increase the productivity and food quality at reduced expenditure and with increased profit because in India most of the population depends on agriculture. Vegetables and fruits are the most important agricultural products. Agricultural production mainly depends on the quality of seed, soil etc.

In order to obtain more valuable products, a product quality control is basically mandatory. The quality of agricultural products may be reduced due to plant diseases.

Plant diseases interrupts its vital functions such as photosynthesis, transpiration, pollination, fertilization, germination etc. These diseases are caused by pathogens viz., fungi, bacteria and viruses, and due to adverse environmental conditions. Therefore, the early stage diagnosis plays an important role in plant disease detection. In plant, diseases can be found in various parts such as fruit, stem and leaves. Plant diseases cause periodic outbreak of diseases which leads to large scale death and famine.

The remaining paper is organized as: Section II covers the Basic methodology used for disease diagnosis, Section III includes discussion of reviewed work. In Section IV the conclusion is given.

II. BASIC METHODOLOGY



III. REVIEWED WORK:

Swapnil Ayane, M. A. Khan and S. M. Agrawal have considered the pattern that appeared on the leaf for detection of disease. The various feature such as shape, area, shape of holes present on the leaf, diseases spot etc. of image of leaf are extracted. These extracted feature are used to determine the occurrences of particular deficiency related to primary nutrient of cotton leaf. Nitrogen deficiency can be detected by two preliminary steps, histogram analysis and measurement of leaf area. The leaf with deficiency has compared to that normal leaf [14].

Hrushikesh Marathe and Prerna Kothe have calculated leaf area through pixel number statics. Leaf spot

can be indicative of crop disease. Infected area is calculated by subtracting total green leaf area [2].
Dheeb Al Bashish, Malik Braik and Sulieman Bani Ahmad have proposed detection model based neural network and they found that this model is very effective in recognizing leaf disease, while K-means clustering provides efficient result in segmentation RGB image [16].

H. Al-Hiary, Bani-Ahmad, M-Reyalat and M. Braik have developed more accurate and fast detection technique of plant disease. In this paper, respectively K-means clustering and neural network have been formulated for clustering and classification of diseases that affect on plant leaf. They found that proposed approach can significantly support an accurate detection of leaf diseases in little computation effort [6].

Basvaraj S. Anami, J.D. Pujari, Rajesh Yakkundinath proposed better machine vision system in the area of disease recognition. In this paper, both the feature color and texture are used to recognize and classify different agriculture product into normal and affected using neural network classifier. For some product use the color feature and other product use texture feature for their disease recognition [8].

Anand Kulkarni and Ashwin Patil developed good classification system for plant diseases. The Gabor filter is used for segmentation and Artificial neural network is used for classification of diseases. Artificial neural network based classifier is adopted which uses the combination of color and texture feature to recognize and classify different plant diseases. Experimental result showed that classification performance by ANN taking feature set is better with accuracy 91% [18].

Patil J. K. and Raj Kumar proposed approach for disease identification on maize leaves. This paper describes the method for extraction of color and texture feature of diseased leaves of maize. Color feature are extracted by computing first, second and third order moments of HSV histogram of an image. The texture features like correlation, energy, inertia and homogeneity are obtained by computing gray level co-occurrence matrix on image [17].

Prof. Sanjay B. Dhaygude and Nitin P. Kumbhar have worked on the texture feature of plant. The texture features of infected leaf are compared to texture features of normal leaf. The developed processing consists of four main steps, first the color transformation structure for input RGB image is created. This RGB image is converted into HSI because RGB is for color generation and HSI is color descriptor. Then green pixels are masked and removed using specific threshold value, then the image is segmented and useful segments are extracted, finally the texture statics is computed using Spatial Gray level Dependence Matrices (SGDM) [3].

Pranjali Vinayak Keskar [9] developed a leaf disease detection and diagnosis system for inspection of affected leaves and identifying the type of disease. This system consist of four stages.To improve the appearance of acquired images, image enhancement techniques are applied. The enhancement is done in three steps: The first stage is transformation of HSI to color space. .In the next stage is analyzing the histogram of intensity channel to get the threshold. Finally intensity adjustment by applying the threshold is done.

P. Revathi M. Hemalatha detected Cotton leaf spot disease by using Homogenous Segmentation based Edge Detection Techniques. This system is analyzed with eight types of cotton leaf diseases they are Fusarium wilt, Verticillium wilt, Root rot,Boll rot,Grey mildew, Leaf blight ,Bacterial blight,Leaf curl.In these work symptoms of cotton leaf spot images are captured by mobile and classification is done by using neural network. In this work a homogeneity operator can take the difference of the center pixel and a pixel that is two or three pixels away. The main aim Research work is to use Homogeneity-based edge detector segmentation, which takes the result of any edge detector and divides it by the average value of the area. This work has been implemented in the real time software and produces best results. The software is very fast and time intense, low cost, automatically identify the diseases and pest recommendation to farmers through a mobile phone.
Ajay A. Gurjar, Viraj A. Gulhane describes Eigen feature regularization and extraction technique by this detection of three diseases can be done. This system is having more accuracy, than that of the other feature detection techniques. With this method about 90% of detection of Red spot i.e. fungal disease is detected [7].

Dheeb Al Bashish & et al. proposed image processing based work is consists of the following main steps : In the first step the acquired images are segmented using the K-means techniques and then secondly the segmented images are passed through a pre-trained neural network .The images of leaves taken from Al-Ghor area in Jordan. Five diseases that are prevalent in leaves were selected for this research; they are: Early scorch, Cottony mold, Ashen mold, late scorch, tiny whiteness. The experimental result indicates that the neural network classifier that is based on statistical classification support accurate and automatic detection of leaf diseases with a precision of around 93% [16].
An Artificial Neuron is basically an engineering approach of biological neuron.

IV. CONCLUSION:

This review provides a new insight in detection of the diseases of plant. From the study of above classification techniques we have come up with following conclusion. The k-nearest-neighbor method is the simplest of all algorithms for predicting the class of a test example. The disadvantage of the KNN method is the time complexity of making predictions. SVM was found competitive with the best available machine learning algorithms in classifying high-dimensional data sets. In SVM computational complexity is reduced to quadratic optimization problem and it's easy to control complexity of decision rule and frequency of error. Using SVM it's difficult to determine optimal parameters when training data is not linearly separable. Also SVM is more complex to understand and implement.

V. REFERENCES :

[1] S. Arivazhagan , R. Newlin Shebiah , S. Ananthi, S. Vishnu Varthini , Detection of unhealthy region of plant leaves and classification of plant leaf diseases using texture features, *Commission Internationale du Genie Rural(CIGR) journal, vol. 15, no.1*, pp:211-217, March 2013.

[2] Hrushikesh Marathe, Prerna Kothe, "Leaf disease detection using image processing technique," *IJERT*, vol 2, Issue 3, March 2013.

[3] Prof.Sanjay B. Dhaygude, Mr.Nitin P. Kumbhar, Agricultural plant Leaf Disease Detection Using Image Processing, *International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering* **,** *S & S Publication vol. 2, Issue 1*, pp: 599-602, 2013.

[4] Simona E. Grigorescu, Nicolai Petkov, and Peter Kruizinga, Comparison of Texture Features Based on Gabor Filters , *IEEE ransaction on Image Processing, vol. 11, No. 10*, pp-1160-1167, oct 2002 .

[5] Prof. Sonal P. Patil, Ms. Rupali S.Zambre, "Classification of Cotton Leaf Spot Disease Using Support Vector Machine "*ISSN : 2248-9622, Vol. 4, Issue 5(Version 1), May 2014, pp.92-97.*

[6] H. Al-Hiary, S. Bani-Ahmad, M. Reyalat, M. Braik and Z. ALRahamneh, Fast and Accurate Detection and Classification of Plant Diseases, *International Journal of Computer Applications, Wageningen Academic publishers, vol. 17, no.1*, pp: 31-38, March 2011.

[7] Ajay A. Gurjar, Viraj A. Gulhane," Disease Detection On Cotton Leaves by Eigenfeature Regularization and Extraction Technique", International Journal of Electronics, Communication & Soft Computing Science and Engineering(IJECSCSE)Volume 1, Issue 1.

[8] Basvaraj S. Anami, J.D. Pujari, Rajesh Yakkundinath, "Identification and classification of normal and affected agriculture / horticulture produce based on combined color and texture feature extraction*," International Journal of Computer Applications in Engineering*, vol 1, Sept 2011.

[9] Pranjali Vinayak Keskar, Shubhangi Nimba Masare, Manjusha Suresh Kadam and Prof. Mrs. Seema U.Deoghare," Leaf Disease Detection and Diagnosis", International Journal of Emerging Trends in Electrical and Electronics (IJETEE) Vol. 2, Issue. 2, April-2013.

[10] P. Revathi, M. Hemalatha, Classification of Cotton Leaf Spot Diseases Using Image Processing Edge Detection Techniques, *IEEE International Conference on Emerging Trends in Science, Engineering and Technology*, pp-169-173, Tiruchirappalli, Tamilnadu, India, 2012.

[11] Abdallah A. Alshennawy, and Ayman A. Aly," Edge Detection in Digital Images Using Fuzzy Logic Technique", World Academy of Science, Engineering and Technology 27 2009 .

[12] Vishakha Metre,Jayshree Ghorpade," An Overview of the Research on Texture Based Plant Leaf Classification", IJCSN International Journal of Computer Science and Network, Vol 2, Issue 3, 2013ISSN (Online): 2277-5420 .

[13] Prof. Meeta Kumar, Mrunali Kamble, Shubhada Pawar, Prajakta Patil,Neha Bonde," Survey on Techniques for Plant Leaf Classification", International Journal of Modern Engineering Research (IJMER) Vol.1, Issue.2, pp-538-544 ISSN: 2249-6645 .

[14] Swapnil Ayane, M. A. Khan and S. M. Agrawal "Identification of nitrogen deficiency in cotton plant by using image processing," *IJPRET*, Vol 1(8), 112-118, 2013

[15] Qinghai He, Benxue Ma, Duanyang Qu, "Cotton pests and diseases detection based on image processing," *TELKOMNIKA*, vol 11, no 6, June 2013 .

[16] Dheeb Al Bashish, Malik Braik and Sulieman Bani Ahmad "Detection and classification of leaf disease using K-mean based segmentation and neural network based classification," *International Technology Journal*, ISSN 1812-5638, pp 267-275, 2011.

[17] Patil J. K. and Raj Kumar, "Feature extraction of diseased leaf images," *Journal of Signal & Image Processing*, vol 3, Issue 1, pp 60-63, ISSN 0976-8882, 2012.

[18] Anand H. Kulkarni, Ashwin Patil R. K., Applying image processing technique to detect plant diseases, *International Journal of Modern Engineering Research, vol.2, Issue.5*, pp: 3661-3664, 2012.