International Journal on Recent and Innovation Trends in Computing and Communication ISSN: 2321-8169
Volume: 5 Issue: 3 492 – 495

A Brief Review on Plant Leaf Disease Detection Using Auto Adaptive Approach

NehaAshvinRelan, Mr. Manish M.Patil
Pursuing M.E. (E&tc), Gangamai College Of Engineering, NagaonDist.Dhule, (M.S.)India.
Asst.Profofessr, Department of E&tc Engineering, Gangamai College Of Engineering, Dist.Dhule. (M.S.) India

Abstract : This proposal is regarding automatic detection of diseases and pathological part present within the leaf pictures of plants and even within the agriculture Crop production it is through with advancement of technology that helps in farming to extend the production. Primarily there is downside of detection accuracy and in neural network approach support vector machine (SVM) is exist already. During this analysis proposal, a completely unique approach can design to extend accuracy victimization KNN. During this analysis work, we are going to work upon the advancement of the plant diseases prediction techniques and going to propose a completely unique approach for the detection rule.

*****

I. Introduction

Digital image process is the use of computer algorithms to perform image process on digital pictures. It permits a far wider vary of algorithms to be applied to the computer file and might avoid issues like the build-up of noise and signal distortion throughout process. Digital image process has terribly important role in agriculture field. it's widely accustomed observe the crop disease with high accuracy. Detection and recognition of diseases in plants mistreatment digital image method is extremely effective in providing symptoms of characteristic diseases at its early stages. Plant pathologists will analyze the digital pictures mistreatment digital image process for diagnosing of crop diseases. Computer Systems area unit developed for agricultural applications, like detection of leaf diseases, fruits diseases etc. altogether these techniques, digital pictures are collected employing a camera and image process techniques are applied on these pictures to extract valuable data that are essential for analysis. The diseases are mostly on leaves and on stem of plant. The diseases are viral, bacterial, fungal, diseases due to insects, rust, nematodes etc. on plant. It is important task for farmers to find out these diseases as early as possible. Following example shows that how diseases on cotton plant reduces the productivity. Image processing techniques could be applied on various applications as follows:

1. To detect plant leaf, stem, and fruit diseases.
2. To quantify affected area by disease.
3. To find the boundaries of the affected area.
4. To determine the color of the affected area
5. To determine size & shape of fruits.

Now, this paper will describe the things which are organized in following way. Next section II will describe different classification techniques. Section III describe will describe related work about this paper. Next section IV contains conclusion and future work.

Fig1: Infected leaf of cotton plant

II. Techniques on image processing

Diseases in plants cause major production and economic losses in agricultural trade worldwide. observation of health and detection of diseases in plants and trees is vital for property agriculture. To the most effective of our data, there's no device commercially accessible for period assessment of health conditions in trees.

The classification strategies are often seen as extensions of the detection strategies, however rather than attempting to observe just one specific sickness amidst totally different conditions and symptoms, these ones attempt to determine and label whichever pathology has effects on the plant.

Neural Networks

This is the strategy to segmentation of the photographs into leaf and background within the following variety of size and color options are extracted from each the RGB and HSI representations of the image. Those parameters are finally fed to neural networks and applied mathematics classifiers that are accustomed confirm the plant condition.

SVM

The method uses many color representations throughout its execution. The separation between leaves and background is performed by an MLP neural network, that is including a color library designed a priori by suggests that of an unsupervised self-organizing map (SOM). the colors gift on the leaves are then clustered by suggests that of an unsupervised and undisciplined self-organizing map. A genetic algorithmic program determines the quantity of clusters to be adopted in every case. A Support Vector Machine (SVM) then separates morbid and healthy regions

Fuzzy classifier

The method tries to spot four totally different organic process deficiencies in feather palm plants. The image is segmental consistent with color similarities, however the authors didn't offer any detail on however this can be done. Once the segmentation, variety of color and texture options are extracted and submitted to a fuzzy classifier, which, rather than outputting the deficiencies themselves, reveals the amounts of fertilizers that ought to be accustomed correct those deficiencies.

Color analysis

The method aims to sight and discriminate among four sorts of mineral deficiencies (nitrogen, phosphorus, potassium and magnesium). The tests were performed victimization fava bean, pea and yellow lupine leaves. before the color analysis, the photographs are born-again to the HSI and L*a*b* color areas. the color variations between healthy leaves and also the leaves underneath take a look at then confirm the presence or absence of the deficiencies.
Geometer distances calculated in each color areas quantify those variations.

Feature-based rules

Methods to spot and label 3 totally different types of diseases that have an effect on paddy crops. As in several different strategies, the segmentation of healthy and morbid regions is performed by suggests that of threshold. The authors tested two types of threshold. Otsu's and native entropy, with the most effective results being achieved by the latter one. Afterwards, variety of form and color options are extracted. Those options are the premise for a collection of rules that confirm the sickness that most closely fits the characteristics of the chosen region.

KNN

k-Nearest Neighbor could be a easy classifier within the machine learning techniques wherever the category identification is achieved by distinctive the closest neighbors to question|a question |a question} examples and so build use of these neighbors for determination of the class of the query. In KNN the classification i. e. to that category the given purpose is belongs relies on the calculation of the minimum distance between the given purpose and different points. As a classifier the closest neighbor doesn't embody any coaching method. it's not applicable just in case of huge variety of coaching examples because it isn't strong to wheezy information. the gap between the take a look at samples and coaching samples is calculated for the plant leaf classification. during this method it finds out similar measures and consequently the category for take a look at samples. A sample is classed supported the very best variety of votes from the k neighbors, with the sample being assigned to the category most typical amongst its k nearest neighbors. K could be a positive whole number, generally tiny. If k = 1, then the sample is just assigned to the category of its nearest neighbor.

III. Literature Review

Many researchers had done research in this field. Following is the related literature review of proposed work:

P. Revathi& et.al (2012) [2] describes to identify the affected part of leaf diseases. At first, Edge detection technique is used for image segmentation, and At last proposed a Homogenous Pixel Counting Technique for Cotton Disease Detection (HPCCDD) Algorithm for image analyzing and classification of diseases. The aim of this research to find the diseases of cotton leaf spot by image processing technique, and analyze the input images by RGB pixel counting and recognize the affected part of leaf spot by Sobel and Canny Edge detection technique and output is obtained.

SantanuPhadikar and Jaya Sil (2008) [3] described a software prototype system for disease detection and used image growing, image segmentation techniques on this.

Geng Ying (2008) [4] et al. studied the methods of image processing. For that purpose they used cucumber powdery mildew, speckle and downy mildews as study samples and to relate the details of effect of simple and medium filter. **Ajay A. Gunjar (2010) [5]**et al. studied the regularization and extraction technology and describe the Eign features of this technology and this technology gives more accuracy than other detection feature technology.

H. Al-Hiary& et al. (2010) [6] describes the three methods of leaf disease detection: 1) To identify the affected part of leaf by using K-means Clustering. 2) To solve the affected part of leaf by using color co occurrence methodology for texture analysis. 3) To find and classify the type of disease by Neural Networks (NN's). In details; first is RGB images of leaves are acquired and apply for color transformation

structure. After that image is segmented by K-means clustering technique and masked the green pixels value and remove the green masked pixels and obtained the threshold value of object by Otsu's method. The RGB images are sets the zero value for converting color co-occurrence technique. After that infected clusters was converted into Hue Saturation Value (HSV) and for texture analysis use the SGDM matrix for each image formation. Finally the recognize the process was execute the solution by Neural Network's .

Table

Sr. No.	Year	Authors	Proposed Work	Advantage	Disadvantage
1	2012	**P. Revathi**	HPCCDD Algorithm for image analyzing and classification of diseases	Reduce the production Loses	Accuracy can be improved
2	2008	**SantanuPhadikar and Jaya Sil**	a software prototype system for disease detection	Zooming Algorithm can easily extract the feature of an image	Success ratio is very low at most of the cases
3	2008	**Geng Ying**	studied the methods of image processing	Comparative analysis	Comparison is not based upon the results
4	2010	**Ajay A. Gunjar**	studied the regularization and extraction technology for feature detection	Achieved 90% of accuracy to detect fungal disease	Only focus is upon fungal disease
5	2010	**H. Al-Hiary**	Build a model by using three techniques 1) Kmeans Clustering. 2) colorcooccurrence methodology for texture analysis. 3) Neural Networks	Tested upon the wide range of disease and give the good results	Could be improved to increase the recognition rate of classification

IV. Conclusion

As, SVM is very complex in calculations and it is not the cost effective testing of each instance and inaccurate to wrong inputs. KNN algorithm is effectual classifier would be used to minimize the computational cost. In previous researches it has proved that KNN has high accuracy rate. KNN classifier obtains highest result as compared to SVM. The comparison would be based upon two parameters Accuracy and Detection time. The study reviews and summarizes some techniques have been used for plant disease detection. A novel approach for classification of plant disease has been proposed.

References

[1] **GarimaTripathiand Jagruti Save** : "AN IMAGE PROCESSING AND NEURAL NETWORK BASED ROACH FOR DETECTION AND CLASSIFICATION OF PLANT LEAF DISEASES", Volume 6, Issue 4, April (2015), pp. 14-20.

[2] **P.Revathi, M.HemaLatha**, Classification Of Cotton Leaf Spot Diseases Using Image Processing Edge Detection Techniques , ISBN, 2012, 169-173, IEEE.

[3] SantanuPhadikar**& Jaya Sil[2008]** Rice Disease Identification Using Pattern Recognition Techniques, Proceedings Of 11th International Conference On Computer And Information Technology, 25-27

[4] Geng **Ying, Li Miao, Yuan Yuan&Hu Zelin[2008]** A Study on the Method of Image PreProcessing for Recognition of Crop Diseases, International Conference on Advanced Computer Control, 2008 IEEE.

[5] 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

[6] **H. Al-Hiary, S. Bani-Ah Mad, M. Reyalat, M. BraikAnd Z. ALrahamneh**, Fast And Accurate Detection And Classification Of Plant Diseases, IJCA, 2011, 17(1), 31-38, IEEE-2010

[7] Tejal **Deshpande, SharmilaSengupta, and K.S.Raghuvanshi**, "Grading & Identification of Disease in Pomegranate Leaf and Fruit," IJCSIT, vol. 5 (3), pp 4638-4645, 2014. [

[8] **P.**Revathi **and 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 (INCOSET), Tiruchirappalli, pp 169-173, 2012.

[9] **Ms. Kiran R. Gavhale, Prof. UjwallaGawande, and Mr. Kamal O. Hajari,** "Unhealthy Region of Citrus Leaf Detection using Image Processing Techniques," IEEE International Conference on Convergence of Technology (I2CT), Pune, pp 1-6, 2014.

[10] Monika **Jhuria, Ashwani Kumar and RushikeshBorse,** "Image processing for smart farming detection of disease and fruit grading," IEEE 2nd International Conference on Image Information Processing (ICIIP), Shimla, pp 521-526, 2013.