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PLANT DISEASE DETECTION

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ABSTRACT

Our India is second largest populated country in the world and most of people are farmers,but farmers are not so much educated so they do not have idea about the different diseases of plants. This is the main drawback of farmers. As they do not identify the different diseases of plants ,huge amount of crops gets affected by diseases. If there is a solution for all these problem then farmers can easily detect the all possible diseases.Inthis paper we discussed different methods used for detection of plant diseases using their leaves images and also we discussed about image segmentation and feature extraction algorithmfor plant disease detection.

KEYWORDS: Image acquisition, Segmentation, feature extraction.

INTRODUCTION

Identification of the plant diseases is the way to preventing some losses in the quantity of the agricultural product. Study aboutplant diseases mean that study of visually observable patterns seen on the plant.Disease detection on plant is very critical for sustainable agriculture and it is very difficult to monitor the plant diseases manually. It requires large amount of work, expertise in the plant diseases, also require the excessive processing time. So, image processing is used to detect the plant disease. Disease detection includes the steps like image acquisition, image pre-processing, segmentation of image, feature extraction and classification.Inthis paper we discussed different methods used for detection of plant diseases using their leaves images and also we discussed some segmentation and feature extraction algorithm used for plant disease detection.

GOAL AND OBJECTIVE

The accurately detection and classification of the plant disease is very important for the successful cultivation of crop and this can be done using image processing. This paper discussed different techniques to segment the disease part of the plant. This paper also discussed some feature extraction and some of classification techniques to extract the features of infected leaf and the classification of plant diseases. We use the ANN methods for classification of disease in plants such as self-organizing feature map, back propagation algorithm, SVMs etc. can be efficiently used. From these methods, we can accurately identify and classify various plant diseases using image processing techniques.

PROBLEM STATEMENT

Carefully observe all symptoms associated with a condition. Note that description in your mind or on paper and check to see whether the statement is true without exception. Compare plants to see whether they are similarly affected in all parts of the field. Check whether non-related plants are similarly affected. Most disease-causing organisms are host specific and they don't affect large number oftypes of plant. If a similar leaf spot or burn is observed on different plant types, then we might expect a drift of toxic substances. On the other hand, certain diseases like cotton root rot can affect number of plants, but we could rule out corn or other grasses, which are not susceptible. Try to get as much information as possible to help detect that problem. County Extension agents have a number of publications that will be helpful to us. If it don't work to correctly identify the problem then, we can select a representative person for observation by the county extension agent.

MATERIALS AND METHODS

WORK STRUCTURE

Plant disease detection system is the system for detecting and providing solutions to the diseases affect the plants. User capture the image of the defected leaves and feed into the system. Image is match in the database, if match then the disease is find .Depend on the defect the proper solution is provided. By using plant detect system we diagnose the problem and solve it.

ARCHITECTURE

Image Acquisition:

Image acquisition in image processing can be preferred as the action of retrieving an image from any source, like a hardware-based source, so it can be passed through whatever processes,which need to occur after som time. When we perform image acquisition in image processing which is first step in the workflow sequence as we know without an image, no processing is possible. The image that is accepted is completely unprocessed and is the result of whatever hardware was used to generate it, which could be important in some fields to have a consistent baseline from which to work. One of theaim of this process is to have a source of input which operates within such controlled and measured guidelines that same image can, if it isnecessary,to be nearly perfectly reproduced under the same conditions so anomalous factors are easier to locate and eliminate.

These are the basic steps for plant disease detection and classification using image processing are shown figure:

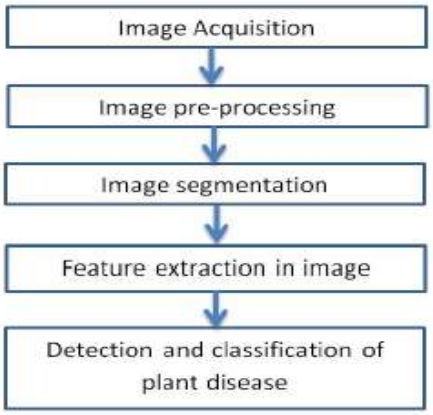

Fig. 1) Basic steps for plant disease detection and classification

Depend upon the field, aimportant factor involved in image acquisition in image processing sometimes is the initial setup and long-term maintenance of hardware which is used to click the images. The actual hardware device might be anything from a desktop scannerupto a massive optical telescope. If the hardware is not properly configured and in a proper format, then visual artifacts can be produced which can complicate the image processing. Improperly setup hardware also can provide images that are of such low quality which cannot be salvaged even with extensive processing. All of these elements are vital to some areas, like comparative image processing, which looks for specific differences between images.

One of the forms of image acquisition in image processing is known as real-time image acquisition. This involves retrieving images from a source which is automatically capturing images. Real-time image acquisition creates a stream of files which can be automatically processed, queued for the work, or stitched into a single media format. One common technology that is used in real-time image processing is called as background image acquisition, which describes both software and hardware which can quickly preserve images flooding into a system.

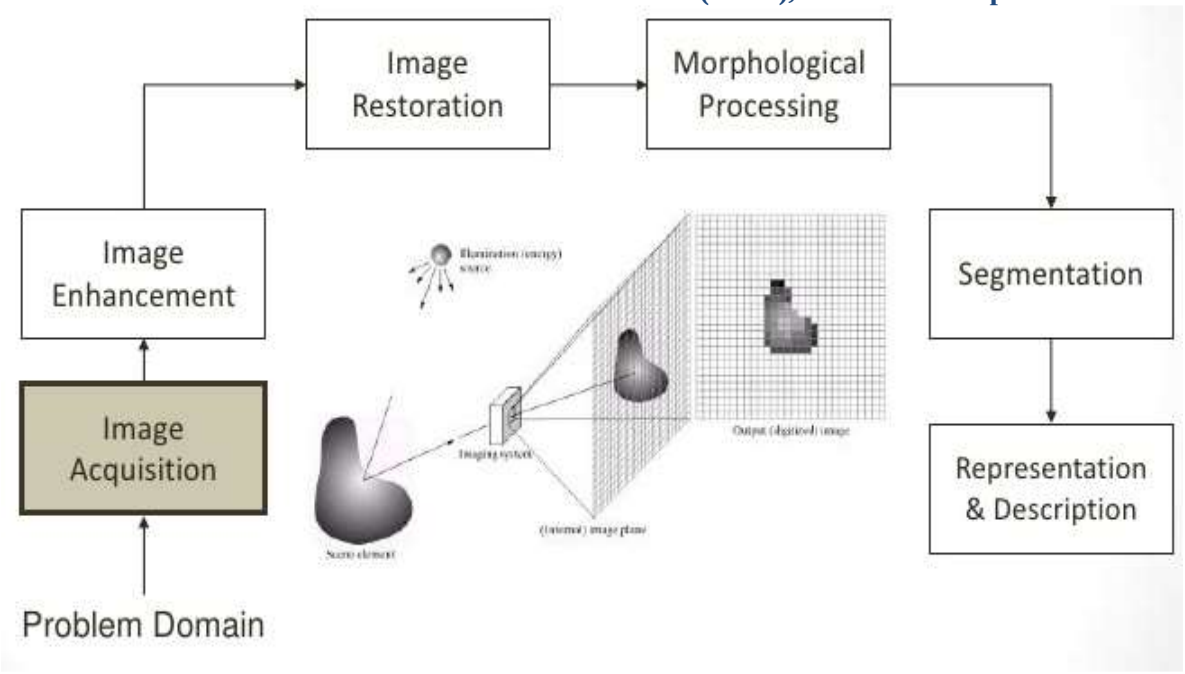

Fig - Image Acquisition

There are many advanced methods of image acquisition in image processing that actually use customized hardware. 3D image acquisition is one of thesemethods.This can require the use of two or more cameras which have been aligned at the precisely describes points around a target, forming a sequence of images that can be aligned to create a three dimensional or stereoscopic scene, or to measure distances. Some satellites use 3D image acquisition techniques to build accurate models of different surfaces.

Image Pre-processing:

To remove noise in image or other object removal, different pre-processing techniques is considered. Image clipping i.e. cropping of the leaf image to get the interested image region. Image smoothing is done using the smoothing filter. Image enhancement is carried out for increasing the contrast. Then the histogram equalization which distributes the intensities of the images is applied on the image to enhance the plant disease images. The cumulative distribution function is used to distribute intensity values.

Image Segmentation:

Segmentation of image is the process of partitioning a digital image into no of segments. The aim of segmentation is to simplify,change the representation of an image into something which is more meaningful and easier to analyze. An image segmentation is basically used to locate objects, boundaries in images. More precisely, image segmentation is the process of allotting a label to every pixel in given image such that pixels with the same label share some characteristics.

The output of image segmentation is a set of segments that collectively cover the entire image,or a set of contours extracted from the image. Each of the pixels in a region are similar with respect to some characteristic or computed property, such as texture,colororintensity. Adjacent regions are significantly different with respect to their same characteristic.When applied to a stack of images, typical in medical imaging, the resulting contours after image segmentation can be used to create three dimensional reconstructions with the help of interpolation algorithms like Marching cubes.

Feature Extraction:

Feature extraction plays an important role for identification of an object. In many application of image processing feature extraction is used. Color, texture, morphology, edges etc. are t he features which can be used in plant disease

detection. onicajhuria et al considers color, texture and morphology as a feature for disease detection. They have found that morphological result gives better result than the other features. Texture means how the colour is distributed in the image, the roughness, hardness of the image. It can also be used for the detection of infected plant areas.

- **Color co-occurrence Method :**

In this method both color and texture are taken into account to get an unique features for that image. For that the RGB image is converted into the HSI translation.

- **Leaf color extraction using H and B components:**

The input image is enhanced by using anisotropic diffusion technique to preserve the information of the affected pixels before separating the color from the background . To distinguish between grape leaf and the non-grape leaf part, H and B components from HIS and LAB color space is considered. A SOFM with back propagation neural network is implemented to recognize colors of disease leaf.

CONCLUSION

The accurately detection and classification of the plant disease is very important for the successful cultivation of crop and this can be done using image processing. This paper discussed various techniques to segment the disease part of the plant. This paper also discussed some Feature extraction and classification techniques to extract the features of infected leaf and the classification of plant diseases. The use of ANN methods for classification of disease in plants such as self organizing feature map, back propagation algorithm, SVMs etc. can be efficiently used. From these methods, we can accurately identify and classify various plant diseases using image processing techniques.

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REFERENCES

1. Wenjiang Huang, Qingsong Guan, JuhuaLuo, JingchengZhang,Jinling Zhao, Dong Liang, Linsheng Huang, and Dongyan Zhang, “New Optimized Spectral Indices for Identifying and Monitoring Winter Wheat Diseases”, IEEE journal of selected topics in applied earth observation and remote sensing,Vol. 7, No. 6, June 2014
2. Dr.K.Thangadurai, K.Padmavathi, “Computer Visionimage Enhancement For Plant Leaves Disease Detection”, 2014 World Congress on Computing and Communication Technologies.
3. Monica Jhuria, Ashwani Kumar, and RushikeshBorse, “Image Processing For Smart Farming: Detection Of Disease And Fruit Grading”, Proceedings of the 2013 IEEE Second International Conference on Image Information Processing (ICIIP-2013
4. Zulkifli Bin Husin, Abdul Hallis Bin Abdul Aziz, Ali Yeon Bin MdShakaffRohaniBinti S Mohamed Farook, “Feasibility Study on Plant Chili Disease Detection Using Image Processing Techniques”, 2012 Third International Conference on Intelligent Systems Modelling and Simulation.
5. Mrunalini R. Badnakhe, Prashant R. Deshmukh, “Infected Leaf Analysis and Comparison by Otsu Threshold and k-Means Clustering”, International Journal of Advanced Research in Computer Science and Software Engineering, Volume 2, Issue 3, March 2012.
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 (0975 – 8887)Volume 17– No.1, March 2011

7. Chunxia Zhang, Xiuqing Wang, Xudong Li, "Design of Monitoring and Control Plant Disease System Based on DSP&FPGA", 2010 Second International Conference on Networks Security, Wireless Communications and Trusted Computing.
8. A. Meunkaewjinda, P. Kumsawat, K. Attakitmongcol and A. Srikaew, "Grape leaf disease detection from color imagery using hybrid intelligent system", Proceedings of ECTI-CON 2008.
9. SantanuPhadikar and Jaya Sil, "Rice Disease Identification using Pattern Recognition", Proceedings of 11th International Conference on Computer and Information Technology (ICCIT 2008) 25-27 December, 2008, Khulna, Bangladesh.