ANALYSIS OF PLANT DISEASES USING IMAGE PROCESSING METHOD

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Abstract- *The current work proposes a method for examination of fungus in plant, using image processing approach. The fungus kills the young seedling; it increases by air and can also contaminate plant. Therefore, it is significant to see the leaf at usual intervals to keep following on quality of increase of plant. The images are capture by digital camera mobile and processing use image growing, and then the element of the leaf spot has been used for the organization reason of the trait and test. The acquire images are in jpeg format and are changed to grayscale image. The grayscale images are improved and make noise free. It has been revealed that the Canny Edge Detection algorithm is about more exclusive compared to Sobel Edge Detection method. K- means clustering method for segmentation of unhealthy part of leaf. At first, the pixels are clustered to construct on their color and spatial features, where the clustering process is consummated. Then, the clustered blocks are combined to an exact several regions. This application produce an authentic robust solution for defecting segmentation of leaves.*

Key words: Leaf disease, image processing, edge detection, k-means clustering segmentation.

1. INTRODUCTION

Farmers face major losses in cultivation in India due to the need of suitable technology. Vegetable features are normally referred to size, shape, mass, firmness, color, and bruises from which it can be secret and sorted. Nevertheless, hi-tech implementation in that area turns unachievable by software, tools as well as operational costs. In development the sustainable agriculture system, the promising technologies have made important involvement. It is initiates that fungus source heavy crop losses amounting to many billion dollars per annum. With these techniques it is now likely to decrease errors, costs to meet environmental and inexpensively sustainable agriculture. We can check a fungus using the different algorithm. There are various methods includes.

1.1 Image Segmentation

It has become an essential mission in today's framework. It is an original action in a various image, video and computer visualization function.

1.2 Edge Detection

It introduces to the procedure of describing and locates sharp progression is an image. Edge detection is used to discover information from the structure as an antecedent step to characteristic extraction and object segmentation.

1.3 K- Means Clustering

Clustering is a data mining procedure of combination trial so that the trials are connected within each group, the groups are called clusters. K-means clustering methods categorize the pixel with same characteristic into one cluster the forming clusters maintained by consistency linking pixels in a cluster. The program carries all images handling as reading and writing of image files, execution on unique pixels, image sectors, whole images and volumes. Volumes ordered as a segment of images can be handled upon omit. It also can carry out basic operations as involution, edge detection, Fourier transform, histogram, editing and color manipulation, dilatation as well as mathematical operation on sets of images such as multiplication and or division.

2. LITERATURE REVIEW

Image processing has been proved to be a useful tool for study in many fields and applications. Cultivation region where the limits like canopy, were the valuable estimate from the farmer's point of view. The investigation of the limits has showed to be valid and less time-consuming as analyzed to habitual methods. [1]

One of the most main techniques is Edge Detection Techniques for legitimate image segmentation. It divides an image into its basic sectors or objects. Image segmentation wants to segment the object from the background to read the image suitably & show the content of the image correctly. The edge characterizes boundaries and is, therefore, a problem of elemental result for image processing. Image Edge Detection notably decreases the amount of data & filters out expect information. Since Edge Detection is in the lead of image processing to object detection, it is necessary to have a good apprehension of Edge Detection Algorithm. [2][3][4].

Image segmentation is the method of independent or grouping an image into same parts. There are presently many ways of achieving image segmentation, align from the simple thresholding method to approach color image segmentation methods. These parts usually compare to substance that humans can easily distinctly and view as objects. Computers have no means of logically identification objects, and so many same methods have been expanded to segment images. The segmentation process is based on different features set up in the image. This ability of color information, boundaries or segment of an image [5,6].

The K-means clustering algorithm is one of the large amounts of a broadly used algorithm. The color based segmentation method that used k-means clustering approach. The k-means algorithm is a repeated method used to split-up an image into k cluster. The standard k-means algorithm constructs valid segmentation results only when appealed to images explained a homogeneous region.[7]

3. PROPOSED METHODOLOGY

The steps occupied in image processing of leaf are shown in Figure. The basic process for leaf disease detection is as follows:
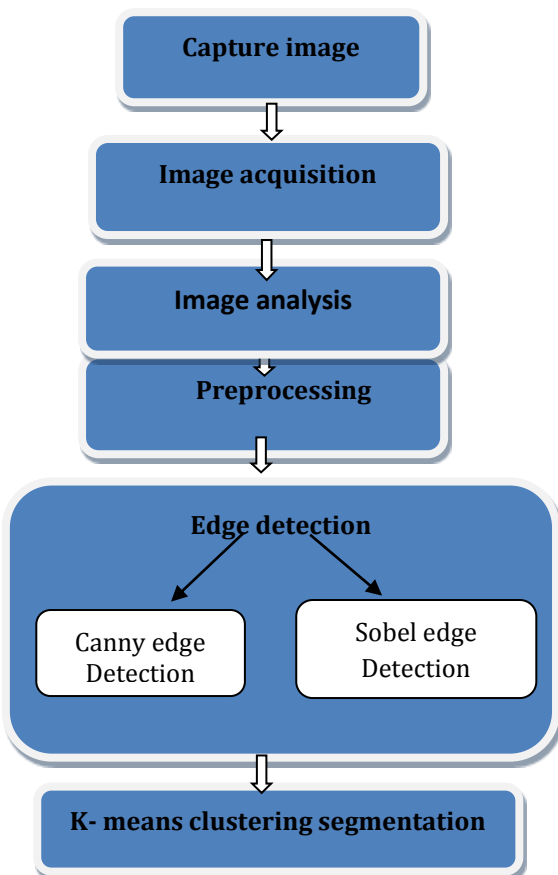

Fig-1: The basic process for leaf disease detection

3.1 Image Acquisition

Image acquisition is the procedure throughout which we get a digital illustration of a sight. This illustration is recognized as an image, and its essentials are called pixels. The electronic device used to capturing a spot is identified as an imaging sensor. A charge-coupled device (CCD) and complementary metal oxide semiconductor (CMOS) are the most mostly used automation in image sensors. A light wavelength is captured by small analogical sensors, which will get major or minor charge controlled by the amount of event light. A suitable output interfaces and a lens in the same housing are all that is wanted to current image acquisition. The elements specified above cover the fore-most aspect of computer vision systems, the camera. Time delay and integration (TDI) are an imaging acquisition view point that can be implemented over CCD or CMOS. It enhances the features of the image acquisition system definitely. TDI is used in applications that need the skill to work in acute illumination conditions, requiring both high speed and high sensitivity.

3.2 Image Analysis

Extracting information from images is performed during the procedure of segmentation. The plan of a segmentation method is to extract the elements of a reputation that are of awareness, i.e., object or region of awareness from the rest of the image, i.e., background of the image or irrelevant mechanism. Hence, we end up with a partitioned image with important regions. The important regions may be cleared as foreground vs background or by selecting a number of entity mechanisms from an image. The creation of the selected regions is based on the image personality such as color, spectral radiance, edge detection, neighbor similarity, in some cases, preprocessing is essential in to get an important segmentation.

3.3 Image preprocessing

Image Preprocessing refers to functioning on images in order to convert it in a proper form on which the algorithm can be worked. The captured images will be cropped and be resized so that it can be successfully tested. In Digital image processing, computer algorithms are applied to do image processing on digital images.

3.4 Edge Detection

Canny Edge Detection -The edge detection process cannot apply frankly on the RGB image. First, we must altering RGB image into grayscale image then the CANNY's edge detection method is applied. So, first separate the layers of RGB image into Red, Green and Blue layer and then apply the CANNY's edge detection

method to get the edges of layered images. This method is useful on both the samples such that healthy sample as well as the diseased sample of same plant.

Sobel Edge Detection- The sobel operator executes a 2-D spatial gradient measurement on an image and so intensify regions of high spatial frequency that go on a correspondence to edges. Naturally it is used to find the estimate supreme gradient size at each point in an input grayscale image.

3.5 K-Means based Segmentation

Following is the steps in k-means clustering:

1. Read input image of leaf.

2. Transfer RGB color space to L* a* b* color space: This transfer authorizes to count the visual variation present in the RGB image.

3. Categorize the colors in a* b* space using kmeans clustering. K-means clustering handles each object as having a position in space. Kmeans discover partition such that object within each cluster is as close to each other as potential and as far from objects in other clusters as possible. Since, the color information manages in the a* b* space. The objects of interest are the pixels with „a*" and „b*" values.

4. To label every pixel in the image use the results from k-means. For every object in the input image, k-means repays an index parallel to a cluster and label every pixel in the image with its cluster index.

5. Create an image that segment the original image by color. This step will result in k number of images of each of which is a segment of the original image that is separated by color. When segmentation is completed, one of the clusters has the diseased spots being produced.

4. CONCLUSION

In the present situation it is very significant to have a well-known approach for grading the defects on the plant leaves routinely. For is routinely detecting the leaf plant as well as to leaf disease detection, Machine Vision Technology is of great use. These systems are going to be very useful for a cultivator since it is capable than the manual method. The proposed system use K- means clustering technique for segmentation of image to segment the leaf area, disease area and background area of the input leaf image in order to compute the percentage infection of the disease in the leaf and to grade them into different classes. These systems can be used to restore the manual leaf recognition method and can be used by agricultural experts in find correct pesticide and its measure to overcome the difficulty in an

efficient and effective way. The future work mostly concerns with the large database. After, Detecting disease conveys medicine on that disease. Another work is a peculiar field with advance characteristic and technology.

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