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LEAF DISESE DETECTION USING IMAGE PROCESSING

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Abstract — *Indian economy is mainly depends on agriculture, so it is need to depend on agriculture productivity as high as possible. But recent days there are plants disease is increase that effect on productivity and it is necessary to detect plant disease. For instance disease named little leaf disease is hazardous disease found in pine trees in United States. Detection of plant disease we have to find out automatic technique find out plant disease so that it reduce large work of monitoring in big farms of crops, and at very early stage it detects the symptoms of disease i.e. when they appear on plant leaves. In this paper presents an algorithm for image segmentation technique which is used for the detection of plant disease use fuzzy logic for detection of plant disease. It survey on detection of plant disease.*

Keywords- *Image Segmentation , Fuzzy Logic*

I. INTRODUCTION

Agriculture is an important source of income for Indian people. Farmers can grow variety of crops but diseases hamper the growth of crops. One of the major factors responsible for the crop destruction is plant disease. Diverse plants experience the ill effects of various diseases. The primary piece of plant to look at the sickness is leaf. The real classes of plant leaf ailments depend on viral, parasitic and microscopic organisms. The diseases of leaf can be diminish both the quality and amount of products and their further development. The simple strategy to identify the plant diseases is assistance with the of farming master knowing about plant ailments. Be that as it may, this manual location of plant sicknesses takes parcel of time and is an arduous work. Henceforth, there is a requirement for machine learning strategy to identify the leaf illnesses. Computer can assume a major part to build up the programmed techniques for the discovery and order of leaf diseases. There can be different example acknowledgment and picture handling methods that can be utilized as a part of the leaf sickness identification. The leaf infection recognition and order of leaf illnesses is the way to keep the horticultural misfortune. Distinctive plant leaves bear diverse sicknesses. There are diverse sorts of techniques and classifiers to recognize plant leaf sicknesses. Programmed identification of plant infections is a vital errand as it might demonstrate valuable in checking expansive field of harvests, and consequently naturally identify ailments from side effects that show up on plant clears out. Thus automatic detection of plant disease with the help of image processing techniques provide more accurate and guidance for disease management. Comparatively, visual identification is less accurate and time consuming. Hence, it is required to design and develop a machine learning method to detect disease.
Following be the cotton plant description

- Cotton is a soft, fluffy staple fiber that grows in a boll, or protective capsule, around the seeds of cotton plants of the genus Gossypium.
- Cotton is the king of fibres, usually referred as white gold .
- Current estimates for world production are about 25 million tones annually. China is the largest cotton production in world
- The United States are the largest exporter for many years.

Fig 1 cotton flower

II. Literature Survey

Sachin D. Khirade and et al [1] Identification of the plant infections is the way to keeping the misfortunes in the yield and amount of the agrarian item. This paper likewise examined some Feature extraction and order systems to separate the highlights of contaminated leaf and the grouping of plant infections.The utilization of ANN techniques for characterization of infection in plants, for example, self-arranging highlight outline, proliferation calculation, SVMs and so forth can be proficiently utilized. We can precisely recognize and group different plant maladies utilizing picture preparing method.

Prof. Sanjay, B. Dhaygudeet al [2] the use of surface measurements for distinguishing the plant leaf ailment has been clarified Firstly by shading change structure RGB is changed over into HSV space in light of the fact that HSV is a decent shading descriptor. Concealing and expelling of green pixels with pre processed edge level.
Amandeep Singh, ManinderLal Singh et al [3] the most critical test looked amid the work was catching the quality pictures with greatest detail of the leaf shading. This was taken care of by utilizing a Nikon made D5200 camera which served the undertaking extremely well. Second test confronted was to dispose of light conditions as from begin to the finish of paddy edit season, brightening changes a ton notwithstanding when the picture getting time is settled. However the answer for this is variable client characterized thresholding and making essential changes in accordance with the shades of LCC.
M.Malathi, K.Aruli and et al [4]They gives review on plant leaf malady location utilizing picture preparing systems. Malady in crops causes noteworthy diminishment in amount and nature of the rural item. Recognizable proof of indications of infection by stripped eye is troublesome for rancher. Harvest security particularly in huge ranches is finished by utilizing mechanized picture handling strategy that can distinguish unhealthy leaf utilizing shading data of leaves. Depending on the applications, numerous picture preparing method has beenacquainted with take care of the issues by design acknowledgment and some programmed grouping apparatuses. In the following area this papers show an overview of those proposed frameworks in important way
MalvikaRanjan, Manasi Rajiv Weginwar et al [5] describes an analysis procedure that is for the most part visual and requires exact judgment and furthermore logical techniques. Picture of unhealthy leaf is caught .As the consequence of division Color HSV highlights are separated. Fake neural system (ANN) is then prepared to recognize the sound and ailing examples. ANN grouping execution is 80.
Y.Sanjana, AshwathSivasamy et al [6]In this it portrays the transferred pictures caught by the cell phones are prepared in the remote server and exhibited to a specialist aggregate for their conclusion. PC vision strategies are utilized for identification of influenced spots from the picture and their order. A basic shading contrast based approach is taken after for division of the sickness influenced injuries. The framework enables the master to assess the examination comes about and gives criticisms to the famers through a notice to their cell phones.
BhumikaS.Prajapati, VipulK.Dabhi et al [7]In this iden-tification and characterization of cotton leaf illness utilizing picture preparing and machine learning procedures was com-pleted. Additionally the study on foundation expulsion and division methods was talked about. Through this study, we inferred that for foundation expulsion shading space trans-formation from RGB to HSV is helpful. We likewise found that thresholding strategy gives great outcome contrasted with other foundation expulsion strategiesWe found that SVM gives great outcomes, as far as exactness, for characterization of maladies. There are five noteworthy strides in our proposed work, out of which three stages have been actualized: Image Acquisition, Image pre-preparing, and Image division.

III. METHODOLOGY

The description of the block Diagram is given below. Here we are taking the various leaf images as dataset and then it is given to the proposed system.

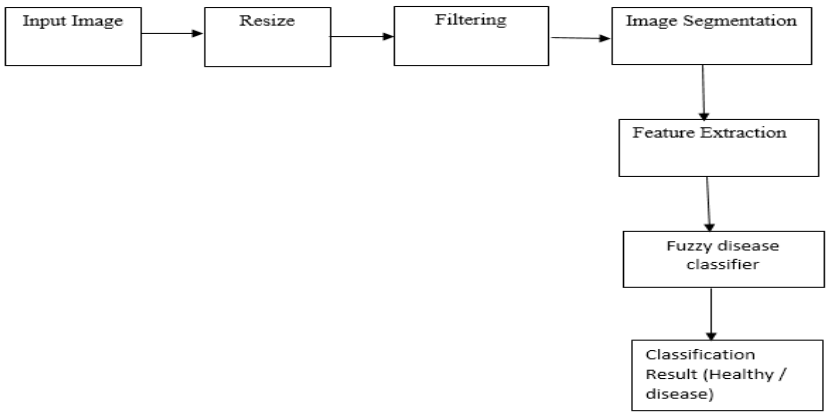

Fig. 2 Block Diagram of the system

THE BLOCK BY BLOCK EXPLANATION OF THE SYSTEM IS GIVEN BELOW.

1. Input Image

The dataset images are consider as the input image which are given to the system for the processing of the data.

2. Pre-processing

Image pre-processing typically denotes a processing step transforming a source image into a new image which is fundamentally similar to the source image, but differs in certain aspects, e.g. improved contrast. According to the above definition, pre-processing results in changing the brightness of individual image pixels. This step includes the physical

transformation of the RGB and the gray scale image. Image pre-processing typically denotes a processing step transforming a source image into a new image which is fundamentally similar to the source image, but differs in certain aspects, e.g. improved contrast.

3. Filtering:

In signal processing, a filter is a device or process that removes some unwanted components or features from a signal. Filtering is a class of signal processing, the defining feature of filters being the complete or partial suppression of some aspect of the signal Most often, this means removing some frequencies or frequency bands. There are many type of filtering Median filtering, Gaussian filtering ,low pass filtering ,high pass filtering . In this paper use Median filtering technique use.

Median Filter: -

It is a nonlinear type of digital filter which is used to remove the noise from the signal and image. It is used to enhance the quality of the signal. The advantage of the median filter it gives the precise output and it preserves edges while removing noise. Median filtering is one kind of smoothing technique, as is linear Gaussian filtering.

4. Image Segmentation:-

Image segmentation is a crucial process for most image analysis consequent tasks. Especially, most of the existing techniques for image description and recognition are highly depend on the segmentation results. Segmentation splits the image into its constituent regions or objects.

5. Feature extraction:-

In machine learning, pattern recognition and in image processing, feature extraction starts from an initial set of measured data and builds derived values (features) intended to be informative and non-redundant, facilitating the subsequent learning and generalization steps, and in some cases leading to better human interpretations. Feature extraction is related to dimensionality reduction.

IV. RESULTS

Pre-proceesing-

The purpose of pre-processing is to remove unwanted objects and noise from the image to facilitate image segmentation into meaningful regions. The Steps required to carry out image pre-processing were implemented on images are as follows:

Step 1: take leaf image from database

Fig 3 Leaf

Resize-

Image interpolation occurs when you resize or distort your image from one pixel grid to another. Image resizing is necessary when you need to increase or decrease the total number opixels, whereas remapping can occur when you are correcting for distortion or rotating an image.

Step 2: resize the leaf image

Fig 4 Resize leaf

Filtering-
The median is nonlinear digital filtering technique, often used to remove noise from an image.
Step 3: apply the filtering process.

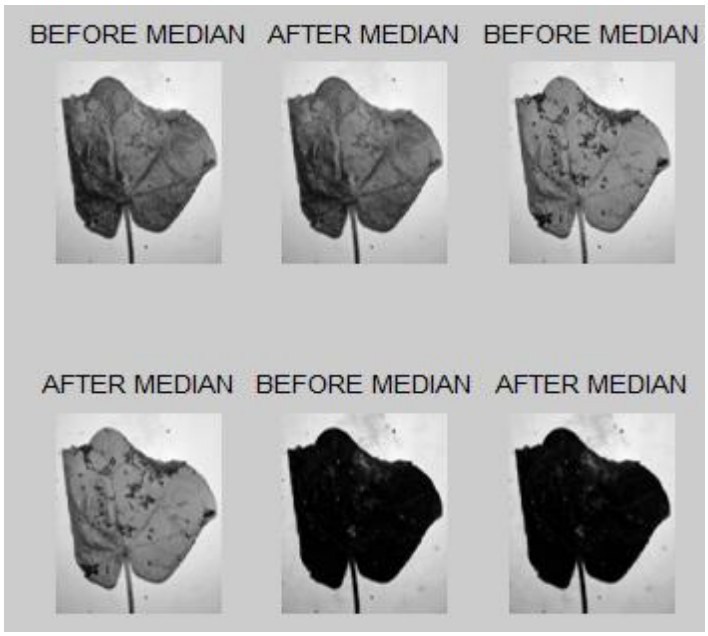

Fig 5 Leaf filtering

Segmentation-
The next and important step is leaf segmentation is to extract meaningful regions, or in other words, distinguish objects from background. This is first level of segmentation.
Step 4: Segmentation of leaf image.

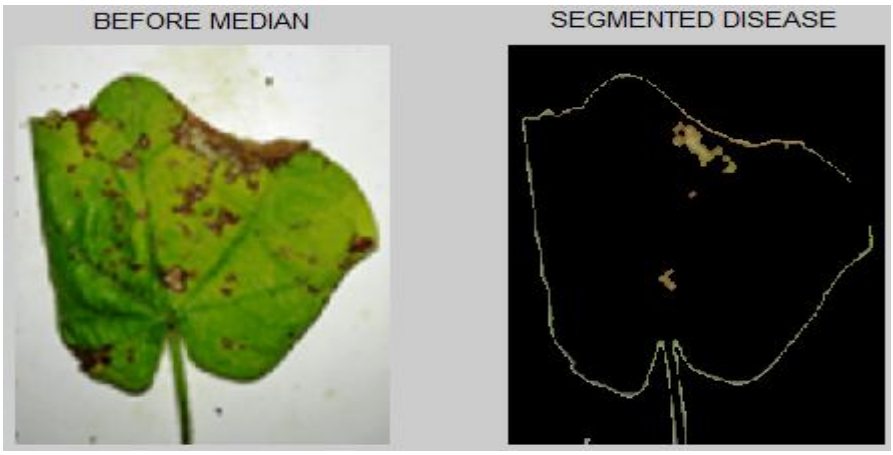

Fig 6 leaf segmentation

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