

# DETECTION OF PLANT LEAF DISEASE USING IMAGE PROCESSING

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## ABSTRACT

Identifying the plant diseases is the key to preventing the losses in the yield and quantity of the agricultural product. to study the plant diseases mean the studies of visually observable patterns seen on the plant. Most of the time reasons for plant diseases are bacteria, fungi, and viruses. Now a day An automatic detection of plant disease is a necessary. Computer vision techniques are used to uncover the affected spots from the image through an image processing technique capable of recognizing the plant lesion options.

**Keyword:** - Digital Pictures, Matlab, Image Processing, Segmentation, Plant-Leaf-Diseases, agricultural-production.

## 1. INTRODUCTION

Plant disease, an impairment of the normal state of a plant that interrupts or modifies its vital functions. All species of plants, wild and cultivated alike, are subject to disease. Although each species is susceptible to characteristic diseases, these are, in each case, relatively few in numbers. The occurrence and prevalence of plant diseases vary from season to season, depending on the presence of the pathogen, environmental conditions, and the crops and varieties grown. Accurate estimates of disease incidence, disease severity and the negative effects of disease on the quality and quantity of agricultural produce are important. Some of the common methods for the diagnosis and detection of plant disease include human observation, microscopic evaluation An alternative methodology is seeking advice from the professional by farmers when signs of diseases crop up, and the expert advice should come in time otherwise it could ends up in loss. Diagnosis of illness on plant will conjointly be tired laboratory testing. But this technique needs satisfactory laboratory conditions on with skilled data. The pathogen detection ways will offer a lot of correct results.

## 2. LITERATURE SURVEY

A lot of researchers have proposed and comes are with some conventional and non-conventional approaches in helping farmers to detect diseases as when their crops are affected.

Hetzroni et al. (2013) [2] presented a system that uses neural networks for monitoring the health of plants. The system tried to detect zinc, iron and nitrogen deficits by observing lettuce leaves. system uses analogue camera to capture the image. then digitalized afterwards. This image is segmented into background and leaf in the first phase of their algorithm. The required feature are extracted from the image. These extracted parameters are fed finally into the analysis phase made of neural networks and statistical classifiers, which then determines the condition of the plant.

Sena et al. (2003) [3] develops a method for detecting diseases on leaves, it uses a pre-set threshold value. this method is divided into two section image processing and image analyzing. First image is transformed to grey scale, filtered and tresholded to removed noise The image is then divided into twelve block at the analysis stage of their algorithm and blocks with leafs less than 5% with respect to the total area are thrown away. The number of connected objects (n) signifying the diseased areas is totaled for each remaining block.

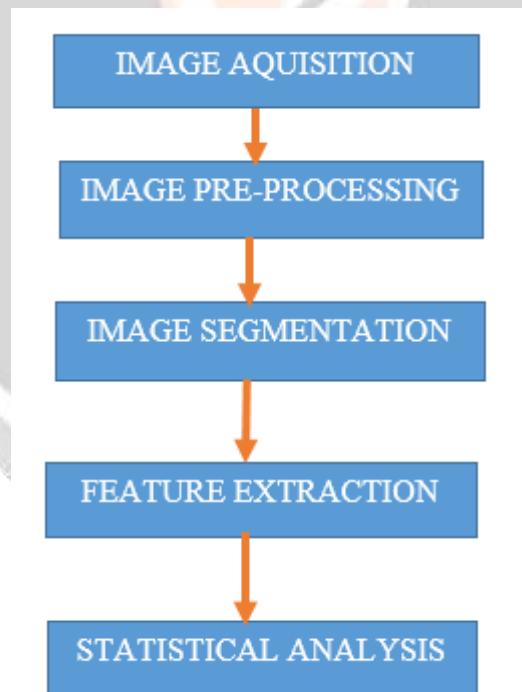
Al Bashish et al.(2010)[6]Proposes a method to detect 5 diverse plant diseases. K-means crowding algorithms used to divide the image into 4 clusters. Then a number of texture and colour features are extracted.

### 3. PROPOSED SYSTEM

The proposed system uses vision-based detection algorithm for detecting plant defect. Digital camera or similar devices are used to take images of leafs of different types, and then those images are used to identify the affected area in leafs. After image acquisition different types of techniques for image-processing are applied on them to get different and useful features needed for the purpose of analyzing later.

The proposed method is divided into subdivision:

- A. Image Acquisition: In this phase of the system plane leaf image is retrieved from some source, usually hardware source for pre-processing. In this system image is captured through digital camera.
- B. Image Preprocessing: Image pre-processing is done to remove the noise or other object from image. the leaf image is clipped to get interested image region. then image smoothing is done using the smoothing filter. Image enhancement is done to increase the contrast.
- C. Image Segmentation: In image segmentation different parts of an image are either grouped together or separated based on certain attributes. There are many approaches of image segmentation. They include thresholding methods from the simple to advanced segmentation for the color image.
- D. Feature Extraction: Feature extraction is important for identification of an object. This methodology considers both the texture and color of an image for feature extraction.



#### 3.1 Advantages

1. Automatic recognition of sick plants by visual inspection of damaged leaves.
2. Benefit in monitoring of large fields, as it provides a chance to discover diseases at an early stage.

### 3.2 Disadvantages

1. Prior information is needed for segmentation. Speed of detection needs to be faster.
2. Very few diseases have been covered and needs to be extended to cover more diseases.

### 4. CONCLUSIONS

The detection of the disease of the plant is very important for the successful cultivation of crop and this can be done using image processing. image processing technique can be used for diseased plant leaf detection. Extraction of features of an infected leaf and the classification of plant diseases can identify and classify various plant diseases and provide the idea about extend of damage for suitable treatment using image processing techniques.

### 5. REFERENCES

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