

# **Detection and Identification of Plant Leaf Diseases based on Python**



**B.Tech Mini Project Synopsis By**  
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## Abstract

The major cause for the decrease in the quality and amount of agricultural productivity is plant diseases. Farmers encounter great difficulties in detecting and controlling plant diseases. Thus, it is of great importance to diagnose the plant diseases at early stages so that appropriate and timely action can be taken by the farmers to avoid further losses. The project focuses on the approach based on image processing for detection of diseases of plants. In this paper, we propose an Android application that helps farmers for identifying plant disease by uploading a leaf image to the system. The system has a set of algorithms which can identify the type of disease. Input image given by the user undergoes several processing steps to detect the disease and results are returned back to the user via android application.

## OBJECTIVE

To Detect unhealthy region of plant leaves particularly Tomato plant. Classification of plant leaf diseases using texture features. Coding is used to analyze the leaf infection.

## INTRODUCTION

The most widely used method for plant disease detection is simply naked eye observation by experts through which identification and detection of plant diseases are done. For doing so, a large team of experts as well as continuous monitoring of experts is required, which costs very high when farms are large. At the same time, in some countries, farmers don't have proper facilities or even idea that they can contact to experts. Due to which consulting experts even cost high as well as timeconsuming too. In such a condition, the suggested technique proves to be beneficial in monitoring large fields of crops. And automatic detection of the diseases by just seeing the symptoms on the plant leaves makes it easier as well as cheaper. Plant disease identification by the visual way is a more laborious task and at the same time less accurate and can be done only in limited areas. Whereas if automatic detection technique is used it will take fewer efforts, less time and more accurately. In plants, some general diseases are bacterial, black spotted, and others are Rust, viral and Red cotton Leaf. Image processing is the technique which is used for measuring the affected area of disease, and to determine the difference in the color of the affected area [1]. Image segmentation is the process of separating or grouping an image into different parts. There are currently many different ways of performing image segmentation, ranging from the simple thresholding method to advanced color image segmentation methods. The segmentation process is based on various features found in the image. This might be color information, boundaries or segment of an image.

## PROBLEM STATEMENT AND PROPOSED WORK

### Image Acquisition

The images of the plant leaf are captured through the camera. This image is in RGB (Red, Green, and Blue) for color transformation structure for the RGB leaf image is created, and then, a deviceindependent color space transformation for the color transformation structure is applied.

### Image Pre-processing

To remove noise in the image or other object removals, different pre-processing techniques is considered. RGB to Gray Converter-Weighted method or luminosity method-You has seen the problem that occurs in the average method. The weighted method has a solution to that problem. Since red color has more wavelength of all the three colors, and green is the color that has not only less wavelength than red color but also green is the color that gives a more soothing effect to the eyes. It means that we have to decrease the contribution of red color, and increase the contribution of the green color, and put blue color contribution in between these two.

## WORK DESCRIPTION

BLOCK DIAGRAM

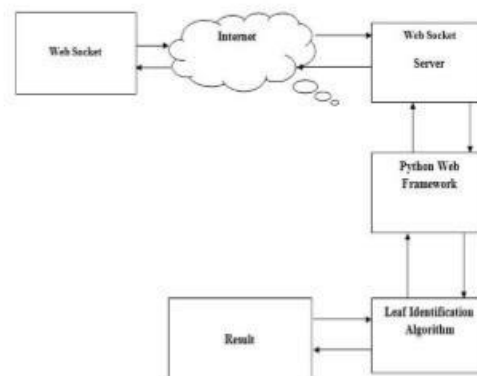


Fig1-System Architecture

### Web Socket:

Web Socket is a computer communications protocol, providing full-duplex communication channels over a single TCP connection. Send the Acquired Image by using a mobile camera to the web socket Server. In Our Project, we used a Local Server.

### Python:

Python is an interpreted high-level programming language for general-purpose programming. In python, OpenCV is to be installed. 'Open source computer vision library' initiated by some enthusiast coders in '1999' to incorporate Image

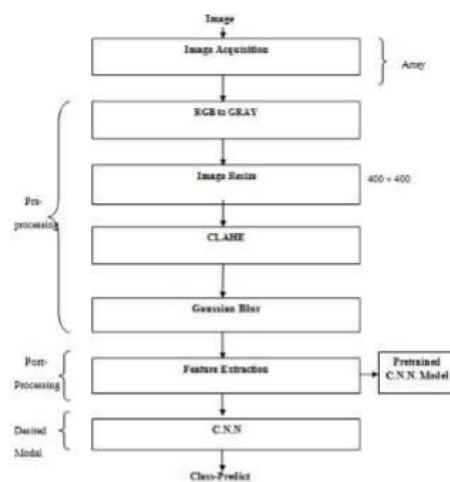
- Processing into a wide variety of coding languages. It has C++, C and Python interfaces running on Windows, Linux, Android, and Mac. It is one of the Libraries used for the image processing in python.

On python web framework by using: leaf

Identification algorithm it detects and identifies the Leaf and diseases. By using

Database it sends the result back to the sender farmer. CLAHE is

Contrast Limited Adaptive histogram equalization. It used for light intensity Equalization. C.N.N.convolutional neural network (CNN, or ConvNet) is a class of deep, feed-forward artificial neural networks, most commonly applied to analyzing visual imagery.



Flow Chart

## HARDWARE AND SOFTWARE DATA

### Hardware Requirements :

- Processor : 2.5 gigahertz (GHz) frequency or above.
- RAM : A minimum of 4 GB of RAM.
- Hard disk : A minimum of 20 GB of available space.
- Input Device : High resolution camera
- Monitor : Minimum Resolution 1024 X 768. 3.2

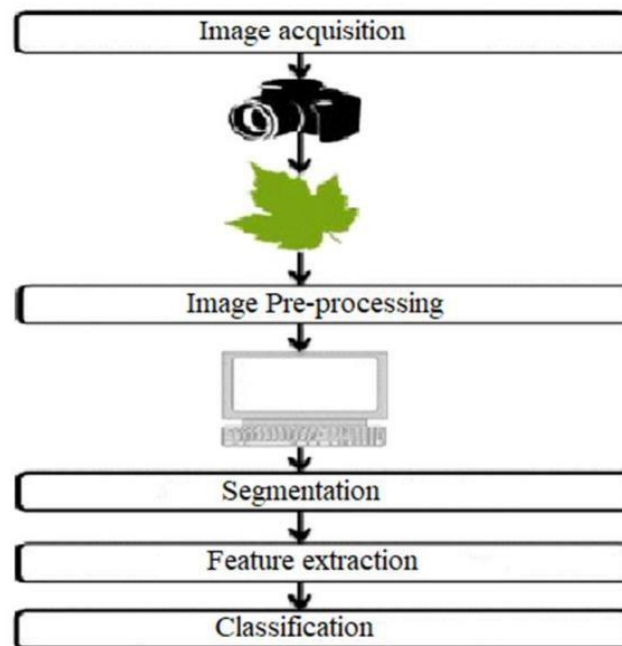
### Software Requirements :

- Operating System : Windows 7 and above.
- Programing language : Python 2.7 and above.

- Platform : JetBrains PyCharm Community Edition 2018.3.5 x64
- Supporting libraries : Tensorflow, OpenCV, PIL, tkinter, os, SKlearn etc.

## IMPLEMENTATION

This part of the report illustrates the approach employed to classify the leaves into diseased or healthy and if the leaf is diseased, name of the disease is mentioned along with the remedies. Our methodology primarily revolves around the following five steps.



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