

# LEAF DISEASE DETECTION

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**ABSTRACT:** In the study on leaf disease detection can be a helpful aspect in keeping an eye on huge area of fields of crops, but it's important to detect the disease as early as possible. This paper gives a method to detect the disease caused to the leaf calculating the RGB and HSV values. Primarily the image is blurred in order to reduce noise. Then the image is converted from RGB to HSV form, after this color thresholding is done. After thresholding foreground or background detection is performed. Background detection leads to feature extractions of the leaf. Then k-means algorithm is applied which can help to cluster the clusters. The following system is a software based solution for detecting the disease with which the leaf is infected. In order to detect the disease some steps are to be followed using image processing and support vector machine. Improving the quality and production of agricultural products detection of the leaf disease can be useful.

## 1. INTRODUCTION

Plant diseases affect the growth and crop yield of the plants and make social, ecological and economical impacts on agriculture. Recent studies on leaf diseases show how they harm the plants. Plant leaf diseases also cause significant economic losses to farmers. Early detection of the diseases deserve special attention. Plant diseases are studied in the literature, mostly focusing on the biological aspects. They make predictions according to the visible surface of plants and leaves. Detection of diseases as soon as they appear is a vital step for effective disease management. The detection is traditionally carried out by human experts. Human experts identify diseases visually but they face some difficulties that may harm their efforts. In this context, detecting and classifying diseases in

an exact and timely manner is of the great importance. Advances in artificial intelligence researches now make it possible to make automatic plant disease detection from raw images. Deep learning can be thought as a learning method on neural networks. One of the advantages of deep learning is that it can extract features from images automatically. The neural network learns how to extract features

## 2. EXISTING SYSTEM

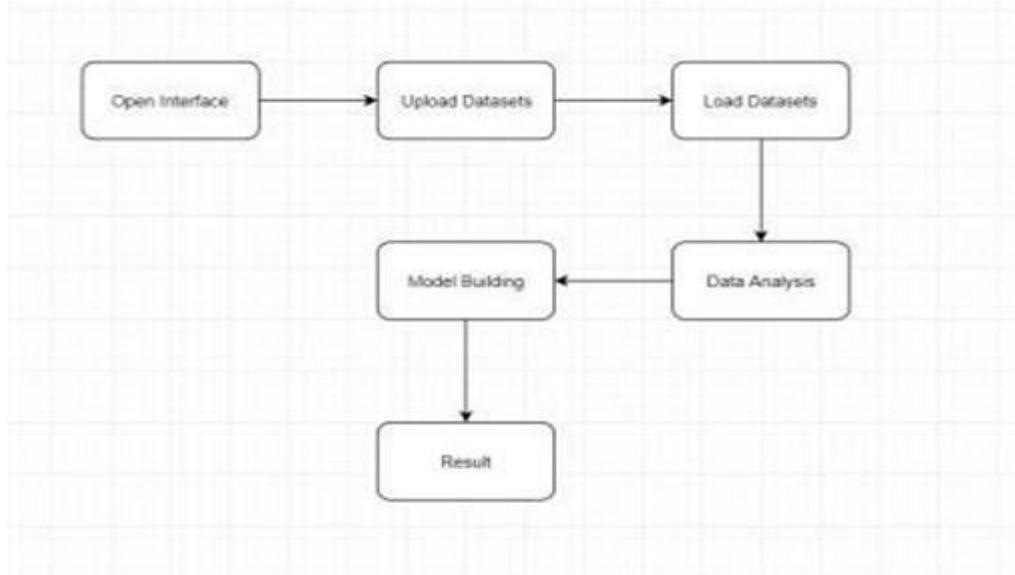
The existing method for plant disease detection is simply naked eye observation by experts through which identification and detection of plant diseases is done. For doing so, a large team of experts as well as continuous monitoring of plant is required, which costs very high when we do with large farms. At the same time, in some countries, farmers do not have proper facilities or even idea that they can contact to experts. Due to which consulting experts even cost high as well as time consuming too. In such conditions, the suggested technique proves to be beneficial in monitoring large fields of crops. Automatic detection of the diseases by just seeing the symptoms on the plant leaves makes it easier as well as cheaper.

## 3. PROPOSED SYSTEM

Our project is to detect the plant diseases and provide the solutions to recover from the leaf diseases. We planned to design our project with voice navigation system so that a person with lesser expertise in software should also be able to use it easily. In our proposed system we are providing a solution to recover from the leaf diseases and also show the affected part of the leaf

by image processing technique. The existing system can only identify the type of diseases which affects the leaf.

#### 4. ARCITECTRE DIAGRAM



#### 5. LITERATURE SURVEY

Many researchers had done research on various plants and their diseases also they had given some techniques to identify that disease. To get understanding of this research area, we carry out a study on various types of plants with diseases. This survey will help to propose novel idea for identification of diseases. Plant diseases have turned into a dilemma as it can cause significant reduction in both quality and quantity of agricultural products. Plant pests and diseases affect food crops, causing significant losses to farmers and threatening food security. The spread of trans boundary plant pest sand diseases has increased dramatically in recent years. Globalization, trade and climate change, as well as reduced resilience in production systems due to decades of agricultural intensification, have all played a part. Outbreaks and upsurges can cause huge losses to crops and pastures, threatening the livelihoods of vulnerable farmers and the food and nutrition security of millions time. Since the beginning of agriculture, generations of farmers have been evolving practices for combating the various plagues suffered by our crops. Following the discovery of the causes of plant diseases in the early nineteenth century, growing understanding of the interactions of pathogen and host has enabled us to develop a wide array of measures for the control of specific plant disease

#### 6. MODULE DESCRIPTION

The following modules are required for

effective purposes. They are,

**Physical Data Acquisition:** Acquiring the physical image of any device means extracting an exact bit-by-bit copy of the original device's flash memory. In contrast to logical acquisition, physically acquired images hold unallocated space, files, and the volume stack, in addition to the extraction of data remnants present in the memory.

**Data Preprocessing:** Data preprocessing is an important step in the data mining process. The phrase "garbage in, garbage out" is particularly applicable to data mining and machine learning projects. Data-gathering methods are often loosely controlled, resulting in out-of-range values, impossible data combinations, and missing values, etc.

**Segmentation:** *Segmentation* is an architectural approach that divides a *network* into multiple segments or subnets, each acting as its own small *network*. This allows *network* administrators to control the flow of traffic between subnets based on granular policies.

**Feature Extraction:** Feature extraction is a process of dimensionality reduction by which an initial set of raw data is reduced to more manageable groups for processing. A characteristic of these large data sets is a large number of variables that require a lot of computing resources to process.

**Decision Making:** Decision making is the process of making choices by identifying a decision, gathering information, and assessing alternative resolutions. Using a

step-by- step decision-making process can help you make more deliberate, thoughtful decisions by organizing relevant information and defining alternatives.

#### 7. PROCESS MODEL USED:

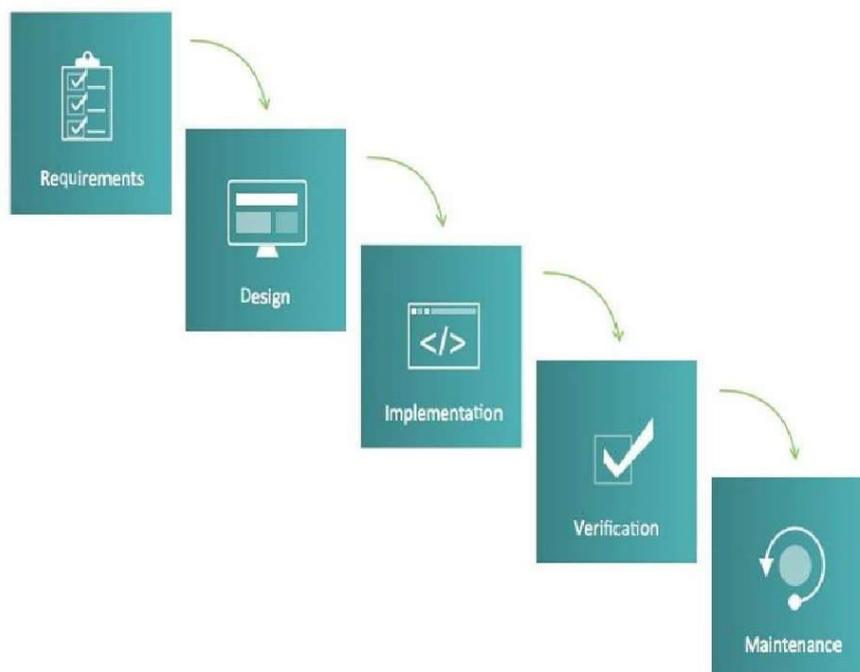
The model that is basically being followed is the WATERFALL MODEL, which states that the phases are organized in a linear order. First of all the feasibility study is done. Once that part is over the requirement analysis and project planning begins.

If a system exists one and modification and addition of a new module is needed, analysis of the present system can be used as a basic model. The design starts after the requirement analysis is complete and the coding begins after the design is complete. Once the programming is completed, the testing is done.

In this model the sequence of activities performed in a software development project

are: Requirement Analysis, Project Planning, System design, Detail design, Coding, Unit testing, System integration & testing. Here the linear ordering of these activities is critical. End of the phase and the output of one phase is the input of the other phase.

The output of each phase is to be consistent with the overall requirement of the system. Some of the qualities of the spiral model are also incorporated like after the people concerned with the project review completion of each of the phases of the work done. WATERFALL MODEL was being chosen because all requirements were known beforehand and the objective of our software development is the computerization/automation of an already existing manual working system.



#### 8.CONCLUSION AND FUTURE ENHANCEMENTS

##### Conclusion:

Data mining technologies has been incorporated in the agriculture industry. This project implements an innovative idea to identify the affected crops and provide remedy measures to the agricultural industry. By the

use of CNN algorithm, the infected region of the leaf is segmented and analyzed. The images are fed to our application for the identification of diseases. It provides a good choice for agriculture community particularly in remote villages. It acts as an efficient system in terms of reducing clustering time and the area of the infected region. Feature extraction technique helps to extract the infected leaf and also to classify the plant diseases. The embedded

voice navigation system helps to guide us throughout the process.

### Future Enhancement:

A future enhancement of the project is to develop the open multimedia (Audio/Video) about the diseases and their solution automatically once the disease is detected.

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