

# FERTILIZERS RECOMMENDATION SYSTEM FOR DISEASE PREDICTION

## 1. INTRODUCTION

### 1.1 Overview

Agriculture is the considered as the back bone of India. An automated system is introduced in the form of identifying different diseases on plants by checking the symptoms shown on the leaves of the plant. Deep learning techniques are used to identify the diseases and suggest the precautions that can be taken for those diseases. To make the system user friendly a User Interface is created for easy access and usage.

### 1.2 Purpose

The purpose of this project is to create a user friendly web page, which helps the farmers to upload their diseased plants leaves and to check the healthiness of the leaves. If the leaves are detected with disease then the project correspondingly gives a meaningful solution to the problem. This helps the farmers to identify the disease in the plant and to seek a meaningful solution in an easier way.

## 2. LITERATURE SURVEY

### 2.1 Existing problem

Our system finds the area of leaf that has been affected and also the disease that attacked the leaf. This is achieved by using Image Processing; there are systems that predict the diseases in the leaf. Our system uses K-Medoid clustering and Random Forest algorithm to produce more accuracy in the detection of disease in the leaf.	R Indumathi.; N Saagari.; V Thejuswini.; R Swarnareka. "Leaf Disease Detection and Fertilizer Suggestion", 2019 IEEE International Conference on System, Computation, Automation and Networking (ICSCAN)
A software solution for fast, accurate and automatic detection and classification of plant diseases through Image Processing is presented in	Guiling Sun, Xinglong Jia and Tianyu Geng, "Plant Disease Recognition Based on Image Processing Technology", <i>Journal of Electrical and Computer Engineering Volume</i> , 2018.
Agriculture fills in as the spine for economy of a nation and is essential. So as to stay aware of good and malady free creation of yields various strategies are being actualized. Steps are being taken in the rustic territories to assist ranchers with best nature of bug sprays and pesticides. In a harvest, ailment generally influences on the leaves by which the yield doesn't get legitimate supplements and because of which its quality and amount additionally gets influenced. In this paper, we are utilizing programming for naturally	Subhangi Kalingania ,Bijay Kumar Ekkab ,Bibhu Santosh Beherac," Disease Detection in Plant Leaf Using Image Processing Technique", International Journal of Research Publication and Reviews Vol (1) Issue (3) (2020) Page 32-36

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recognizing the influenced region in a leaf and furnishing with a superior arrangement. For knowing the influenced region of a leaf we are utilizing different picture handling methods. It incorporates a few stages viz. picture procurement, picture prepreparing, division, highlights extraction	
Diseases in plants cause decrease in both quality and quantity of agricultural products. The main problem of farmers is the detection of leaf diseases. The leaf disease detection has very important role nowadays. Thus, it is of abundant prominence to diagnose the plant diseases at initial stages so that suitable and timely action can be taken by the farmers to avoid further losses. Early information on crop health and disease detection can encourage the control of diseases through appropriate administration systems. This technique will improve productivity of crops. This paper presents the technique to detect the leaf disease also compares the benefits and limitations of these potential methods	B Mallikarjuna, B Jagadeesh Babu, D Imran, K Chandrashekhar, D Rajasekhar,"DETECTION OF LEAF DISEASES USING IMAGE SEGMENTATION", International Journal of Creative Research Thoughts (IJCRT), Volume 8, Issue 5 May 2020
This paper provides survey on plant leaf disease detection using image processing techniques. Disease in crops causes significant reduction in quantity and quality of the agricultural product. Identification of symptoms of disease by naked eye is difficult for farmer. Crop protection especially in large farms is done by using computerized image processing technique that can detect diseased leaf using color information of leaves.	M.Malathi , K.Aruli , S.Mohamed Nizar, A.Sagaya Selvaraj," A Survey on Plant Leaf Disease Detection Using Image Processing Techniques", International Research Journal of Engineering and Technology (IRJET), lume: 02 Issue: 09   Dec-2015

### 2.2 Proposed solution

What is the method or solution suggested by you?

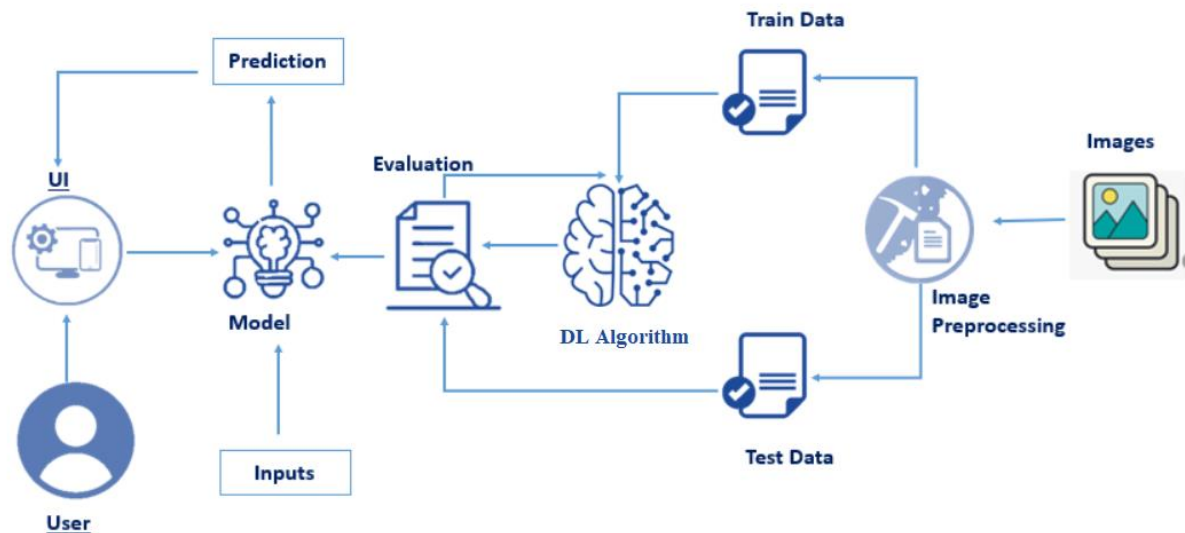
Agriculture is the most important sector in today's life. Most plants are affected by a wide variety of bacterial and fungal diseases. Diseases on plants placed a major constraint on the production and a major threat to food security. Hence, early and accurate identification of plant diseases is essential to ensure high quantity and best quality. In recent years, the number of diseases on plants and the degree of harm caused has increased due to the variation in pathogen varieties, changes in cultivation methods, and inadequate plant protection techniques.

## FERTILIZERS RECOMMENDATION SYSTEM FOR DISEASE PREDICTION

An automated system is introduced to identify different diseases on plants by checking the symptoms shown on the leaves of the plant. Deep learning techniques are used to identify the diseases and suggest the precautions that can be taken for those diseases.

### 3. THEORITICAL ANALYSIS

#### 3.1 Block diagram



Block Diagram

#### 3.2 Hardware / Software designing

##### HARDWARE SPECIFICATION

Processor	Intel(R) Core(TM) i3-3227U CPU @ 1.90GHz 1.90 GHz
Ram	4 GB.
HDD	100 GB.
Monitor type	15 Inch VGA.
Keyboard	110Keys Keyboard

##### SOFTWARE SPECIFICATION

Operating system	Windows 10
Web Browser	Chrome, Mozilla firefox
Open Source Distribution	Anaconda Navigator
Language	Python
Development	Jupyter Notebook and Spyder
Packages Required	Numpy, Pandas, Tensor Flow,
JSON	VS Code
Web Application Tool	Flask
Front End Designing	HTML, Java Script and CSS

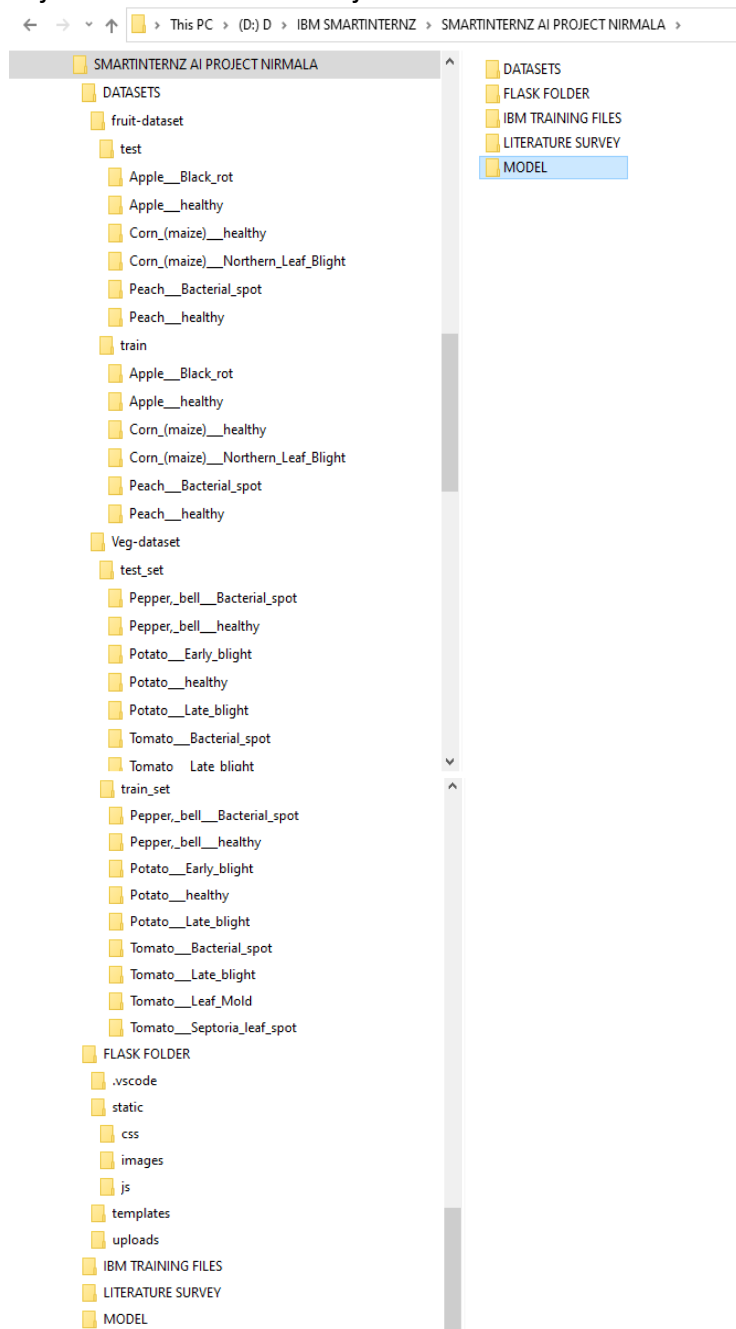
### 4. EXPERIMENTAL INVESTIGATIONS

Submitted by M.Nirmala / Assistant Professor, Hindusthan College of Engineering and Technology, Coimbatore. email: nirmala.mca@hicet.ac.in

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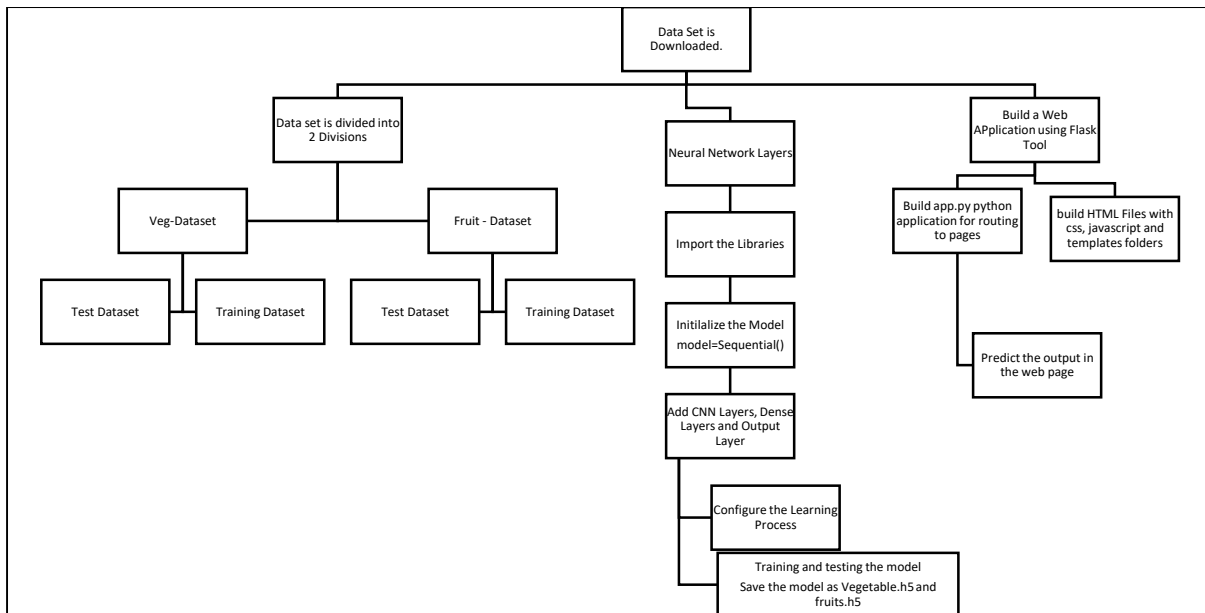
Analysis or the investigation made while working on the solution.

## Project Structure of the Project



## FLOWCHART

# FERTILIZERS RECOMMENDATION SYSTEM FOR DISEASE PREDICTION



## 5. RESULT



# FERTILIZERS RECOMMENDATION SYSTEM FOR DISEASE PREDICTION

Student Dashboard x Plant Disease Prediction x +

127.0.0.1:5000/prediction



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## Plant Disease Prediction

Drop in the image to get the prediction

Fruit


Choose...



Predict!

Plant Dis

Choose...



Prediction: Ooops!! Your peach plant is infected by Bacterial Spots. This is a difficult disease to control when environmental conditions favor pathogen spread. Compounds for the treatment include copper, oxytetracycline (Mycoshield and generic equivalents), and syllit+captan; however, repeated applications are typically necessary for even minimal disease control.

Type here to search

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# FERTILIZERS RECOMMENDATION SYSTEM FOR DISEASE PREDICTION

Student Dashboard x Plant Disease Prediction x +



127.0.0.1:5000/prediction

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## Plant Disease Prediction

Fruit

Choose...



Prediction: Yaayy!! Your corn plant is healthy. But, maintain the soil consistently moist, but not soggy and only need fertilizer every 6 months. It prefers temperatures of 75 to 80 degrees F.

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Student Dashboard x Plant Disease Prediction x +



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## Plant Disease Prediction

Vegetable

Choose...



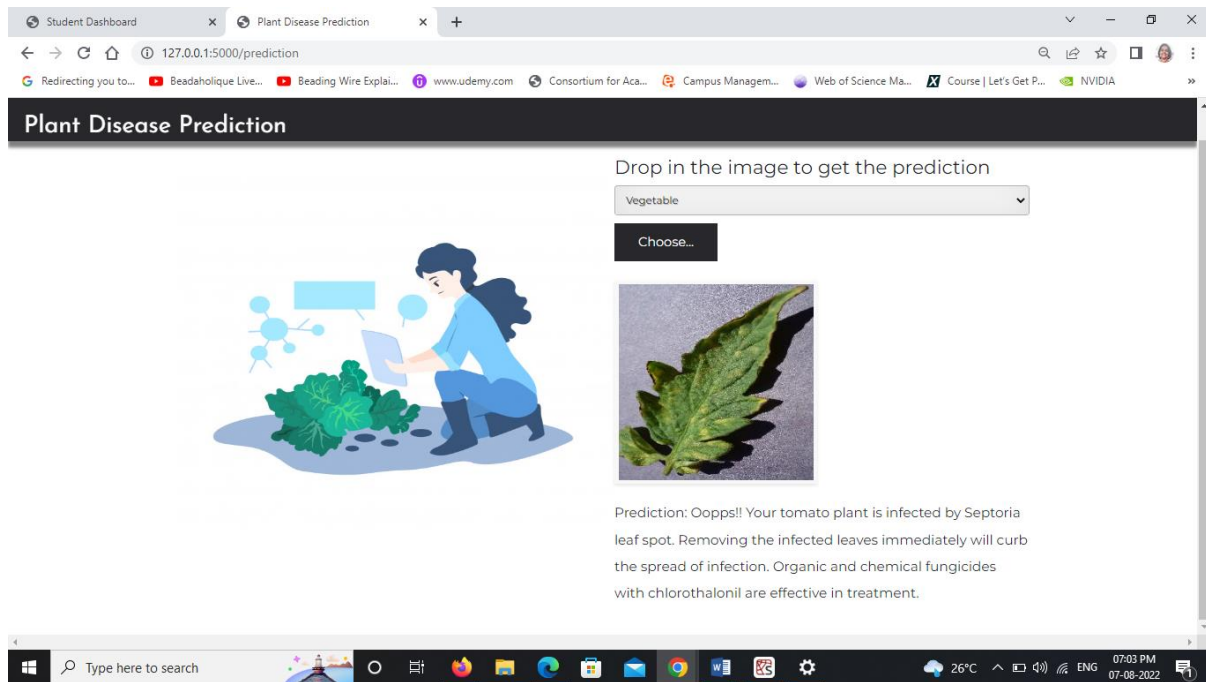
Prediction: Yaayy!! Your pepper plant is healthy. But, take the necessary precautions like, putting the plant where it gets at least 10 hours of direct sunlight. Keep soil evenly moist for good growth. Peppers need well draining soil that is rich and loamy, but avoid too much nitrogen in the soil. Too much nitrogen can cause plenty of leaves and little to no peppers. Your soil should have a pH between 6.0 and 6.5.

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# FERTILIZERS RECOMMENDATION SYSTEM FOR DISEASE PREDICTION



## 6. ADVANTAGES & DISADVANTAGES

### Advantages

- The problem is able to identify whether the leaf is infected with disease and also able to say the type of infection it is been affected and also the solution for the problem.
- The ImageDatagenerator requires lower memory usage and saves a lot of memory.
- The transformed images after applying Augmentation techniques with Keras ImageDataGenerator class only returns the transformed images and does not add it to the original corpus of images

### Disadvantages

- The problem has supported with only 6 classes with respect to fruits data set and 9 classes with respect to vegetable data set.
- The problem need to be further extended to support the farmers community to help them to predict the diseased crop and the applicability of required fertilizers to overcome the problem

## 7. APPLICATIONS

The problem can be applied to the farmer community for the fertilizer recommendation system for disease prediction.

## 8. CONCLUSION

The problem of identifying the disease captured in the leaves and also the measures to resolve the disease is also explained in the web application. The training and testing of varied fruits leaves images and vegetable leaves images are done using ImageObjectGenerator and the various Neural Network layers are added to train the images and also appropriately tested to get the disease predicted and the measures to be followed by the farmers is appropriately outputted in the web page.



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## 9. FUTURE SCOPE

Further extension of this project should be done for all vegetables and fruits using the appropriate diseased and healthy leaves getting trained and tested. In this case the project is limited to only 6 classes with respect to fruits and 9 classes with respect to vegetables. Furthermore, new feature images should be trained and tested using ANN and the web page design can also be improved for further additions.

## 10. BIBLIOGRAPHY

- [1] R Indumathi.; N Saagari.; V Thejuswini.; R Swarnareka. "Leaf Disease Detection and Fertilizer Suggestion", 2019 IEEE International Conference on System, Computation, Automation and Networking (ICSCAN)
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- [5] M.Malathi , K.Aruli , S.Mohamed Nizar, A.Sagaya Selvaraj," A Survey on Plant Leaf Disease Detection Using Image Processing Techniques", International Research Journal of Engineering and Technology (IRJET), lume: 02 Issue: 09 | Dec-2015