

# **Minor Project Synopsis**

## **Plant Disease Identification & Diagnosis**

Under the guidance of

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Submitted By

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# Synopsis

**Topic :** Plant Disease identification and Diagnosis

## **Problem Statement :**

Develop a mobile application that predicts plant's disease and recommend the remedies to cure that disease and also tell the preventive measures so that the disease doesn't occur in future. The app would interact with a backend server which has a model running to predict the plant disease and the server transmits back the result to the application to show to the user.

## **Motivation :**

The main motivation behind "Plant Disease Diagnosis and Treatment Through Deep Learning" is to provide remedies recommended by experts and scientists to the farmers at their home or fields where they can cure their crops immediately and using correct medicines. There have been attempts to solve these problems, but none of the solutions have been particularly effective. However, application of deep learning in agricultural sector to detect and cure crop diseases has potential to change all these problems. If diseases can be caught in their early stages then we could prevent the worldwide loss of economy related to agricultural sector.

## **Objectives:**

- To collect and curate a comprehensive dataset of plant images showcasing various diseases and healthy conditions.
- To design and implement a deep learning model capable of accurately identifying and diagnosing plant diseases based on input images.
- To develop an intuitive and user-friendly interface for farmers to interact with the system.
- To evaluate the performance of the developed system through rigorous testing and validation processes.

## **Methodology :**

This section gives background information about specific requirements of the product to be developed in brief. Although we will not describe every requirement in detail, this section will describe the factors that affect the final product.

The product has four main components: a mobile client which is the mobile application, a backend server which is made using flask in our case and a trained model which would predict the disease in the given image and a database which would store the treatment to various diseases and preventive measures which could be taken in order to prevent those diseases to happen in future.

The first component is the mobile client which is basically a mobile application where the end user needs to login and after login he can click image of the leaf of the diseased crop and the app will tell him the disease and the cure for that particular disease.

In order to predict the disease, the mobile application communicates with the backend flask server. The app sends the clicked image to the server and the trained model which has been deployed on the server runs on the received image and predicts the disease. After predicting the disease, the server responds back to the mobile application but before the it checks into the database.

The database consists of the treatments for various diseases. The server searches the treatment for the predicted disease in the database and responds back to the app giving it the predicted disease and its chemical and biological cure. Along with that it also gives the preventive measures that can be taken so that the disease does not infects the crops in future.

The overall functioning of the entire system is show in below figure:

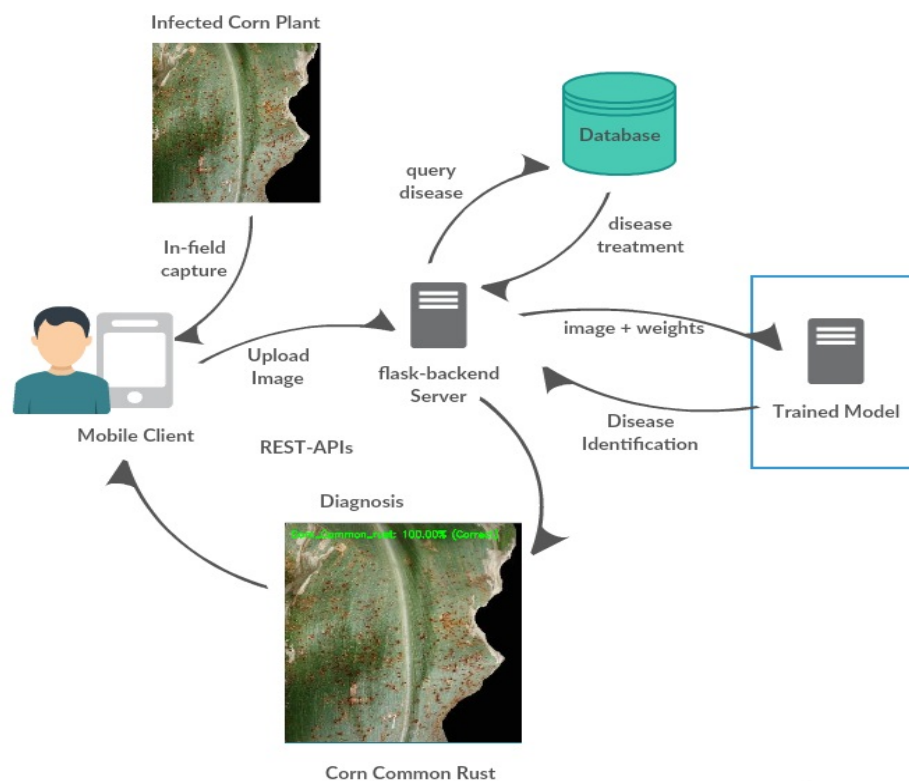


Figure : Overall functioning of the entire system

## **Hardware & Software to be used :**

### Hardware

OS : Windows, Mac  
RAM : 8GB and Above  
Processor : intel i5, M1  
Disk Size : 512 GB  
GPU : NVIDIA 4GB

### Software

Colab  
Android Studio

## **Conclusion:**

Finally, it is concluded that the model is successfully tested on the field images which gives the good accuracy so that the model can be used as a product to help the farmers. Now, we have to just know the remedies and the system is good to go. Further, in the same application, we can expand the idea. Instead just of only one crop, we can make another portal in the app in which scientist can upload the photo of certain diseased plants and train the model. This thing can expand the application and can be more useful. Since, Agriculture is a vast field. So, we have only implemented a product which can detect disease and tell the farmer that the following method should be used but as technology is improving, we can implement a method in which robot does the human labor task for spraying. In this method, first of all we have to detect the affected area using the same process of convolutional neural network, afterwards we can finally apply the process. It is itself a research area.

## **Future Scope :**

- Plant Disease Diagnosis and Treatment using AI algorithms can prove to be a major breakthrough as far as the modern technology is concerned. With advances in Artificial Intelligence especially Deep Learning, the disease in the plant could be detected more efficiently and accurately without experts' advice.
- By removing expert's intervention, diseases in plants could be detected more quickly as the user just has to click an image of the diseased plant and the system will detect the disease and show the cure.
- Furthermore, complete human intervention can be avoided by deploying AI robots in the fields which would scan the fields for suspected disease and spray the correct medicine to cure the disease.
- Also, it can further be extended by installing cameras in the fields which would take images of the plant leaves regularly and check for their healthiness and if any disease is found they could sound an alarm so that the farmer could come and check what the alarm was for.