Effectively Protect Plant Leaf from Disease Using Flask Frame Work

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ABSTRACT
In recent years, plant leaf diseases has become a widespread problem for which an accurate research and rapid application of deep learning in plant disease classification is required, tomato is also one of the most important plants and seeds which are used worldwide for cooking in either dried or fresh form, tomato are a great source of protein that offer many health benefits, but there are a lot of diseases associated with tomato leaf which hinder its production. Thus, an accurate classification of tomato leaf diseases is needed to solve the problem in the early stage. A deep learning approach is proposed to identify and classify leaf disease by using public dataset of leaf image and CNN model with the open source library TensorFlow. In this project, we proposed a method to classify tomato leaf disease and to find and describe the efficient network architecture (hyper parameters and optimization methods). Moreover, after applying each architecture separately, we compared their obtained results to find out the best architecture configuration for classifying tomato leaf diseases and their results.

I.   INTRODUCTION
The occurrence of plant diseases has a negative impact on agricultural production. If plant diseases are not discovered in time, food insecurity will increase. Early detection is the basis for effective prevention and control of plant diseases, and they play a vital role in the management and decision-making of agricultural production. In recent years, plant disease identification has been a crucial issue. Disease-infected plants usually show obvious marks or lesions on leaves, stems, flowers, or fruits. Generally, each disease presents a unique visible pattern that can be used to uniquely diagnose abnormalities. Usually, the leaves of plants are the primary source for identifying plant diseases, and most of the symptoms of diseases may begin to appear on the leaves.

PROPOSED SYSTEM
➢ In this project we are going to propose a deep learning method to train an images of dataset.
➢ The algorithm we are going to use is CNN algorithm in the deep learning model.
➢ The images are trained by using the CNN algorithm and predicted the accuracy values and the trained model file are stored as model file (h5)
➢ By using this model file we are implementing that in the flask frame work model.
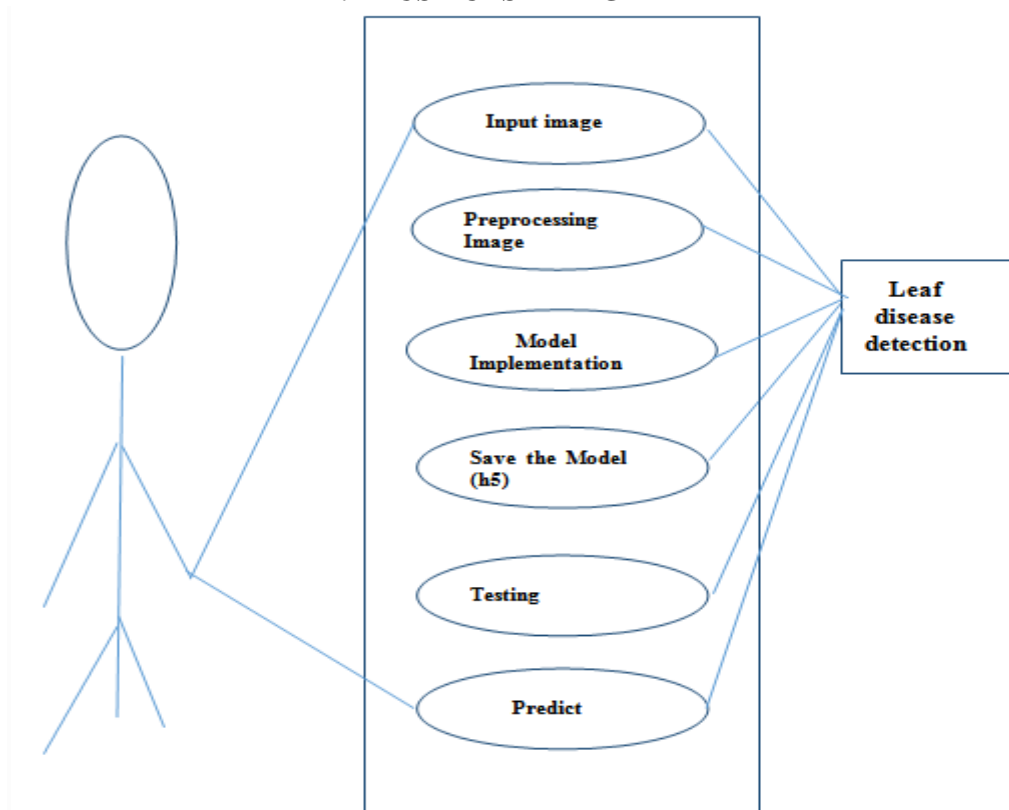➢ Implemented as web application by using the flask frame work

ADVANTAGES
◼ More performance
◼ High accuracy
◼ Image as dataset and input through web application.

II. SYSTEM ARCHITECTURE
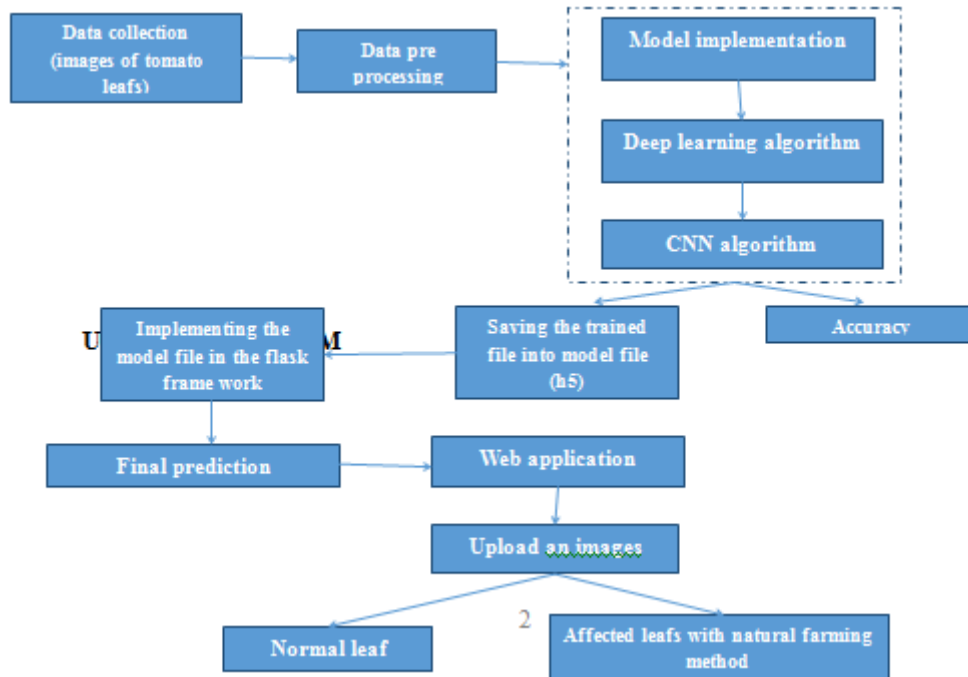
III. USE CASE DIAGRAM

SYSTEM MODULES
Module 1: Dataset collection
Module 2: Pre-processing
Module 3: Model Implementation
Module 4: Implementing in the flask frame work
Module 5: Final prediction

Module 1:Data Collection
Data represents information collected in the form of numbers and text. Data collection is generally done after the experiment or observation. Primary data and Secondary data are helpful in planning and estimating. Data collection is either qualitative or quantitative.
Here for this project we are using images of leafs
The images were taken from kaggle website

Module 2: Pre processing
Data preprocessing is the process of transforming raw data into a useful, understandable format. Real-world or raw data usually has inconsistent formatting, human errors, and can also be incomplete. Data preprocessing resolves such issues and makes datasets more complete and efficient to perform data analysis

Module 3: Model Implementation
For this project we are using deep learning method to identify the plant leafs disease by using CNN algorithm.

Module 4: Implementing in the flask frame work
By using the CNN algorithm we train the dataset and predicted the accuracy for the dataset.
The trained model is saved as a model file (h5)
The model file is implemented in the flask frame work to build a web application format.

Module 5: Final prediction
Implementing in the flask frame work to get the output in the web application format.
Upload the image and get the final output as a solution for medical treatment and natural farming methods.
The final prediction is normal or with disease affected

IV.   CONCLUSION
In this project, a tomato leaf diseases detection and classification method is presented based on Convolutional Neural Network algorithm. The dataset consist of tomato leaves images. Three different input matrices have been obtained for R, G and B channels to start convolution for every image in the dataset. The experiments have been carried out on healthy and diseased leaf images to perform classification. It is concluded that the proposed method effectively recognizes four different types of tomato leaf diseases. To improve recognition rate in classification process different filters or different size of convolutions can also be used. And implemented in the web application by using the flask frame work. The natural farming method is also applied in this concept.

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