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Crop Disease Prediction System

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ABSTRACT

The Crop Disease Detection System is a groundbreaking and timely solution that aims to tackle the challenges faced by agriculture. As the global population continues to grow and put pressure, on food production it is crucial to adopt farming practices and effectively manage crop diseases. This system utilizes the power of machine learning and image recognition to empower farmers, gardeners and agricultural professionals with a tool that can accurately diagnose diseases affecting their crops. By uploading images of affected plants users can rely on algorithms within the system to identify the specific disease and provide customized solutions, for mitigating its impact.

Keywords: python, Disease, VGG-16 Algorithm

I. INTRODUCTION

In an era where agriculture plays a pivotal role in ensuring global food security, the development of innovative technologies to safeguard crops is of paramount importance. The Crop Disease Detection System represents a cutting-edge solution that harnesses the power of machine learning and image recognition to empower farmers and gardeners. This revolutionary system enables users to swiftly and accurately diagnose diseases in their crops by simply uploading images of affected plants. Through advanced algorithms and data-driven insights, the Crop Disease Detection System not only identifies the ailments but also provides tailored solutions, thereby offering a critical tool to enhance agricultural productivity, minimize crop losses, and promote sustainable farming practices. With the fusion of technology and agriculture, this system stands as a beacon of hope in the quest to meet the ever-growing demands of our global population while safeguarding our environment and resources.

II. METHODOLOGY

For the purpose of detecting plant diseases, many approaches may be applied. However, machine learning-based image classification is a widely utilized strategy. Here is fundamental process for creating a machine learning model for plant/crop disease detection:

1. Data Collection and Preparation: Gather a comprehensive dataset of images of healthy and diseased plants for training and validation. Here we will be using plant village dataset which consists of several crops and plants classified into a total of 39 classes. Clean, preprocess and annotate the dataset if not labelled. The preparation of dataset includes image resizing and transformation,

2. Preprocessing Data: Remove any extraneous information from data, such as HTML elements, punctuation, and stop words. To get a collection of pertinent characteristics, also do text normalization and feature extraction.

3. Split the dataset into test dataset and training dataset respectively.

4. Transfer Learning: It is a machine learning method where we use the knowledge learned from one task to solve another related task. In this technique, a pretrained model is used to optimize our task and apply some modifications to achieve the result. We will be using vgg16 model which is a CNN model consisting of 16 layers pretrained on a dataset of millions of images which are classified into 1000 different classes.

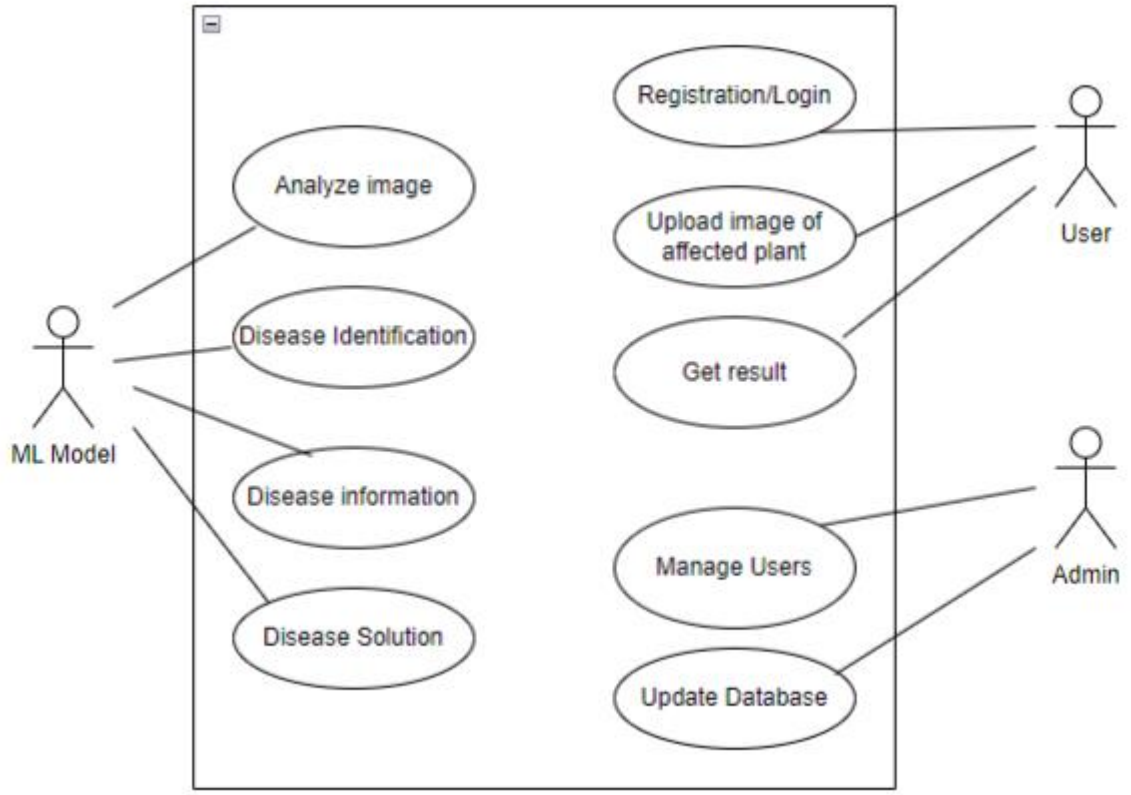
5. Model Training: The training dataset is used to train the machine learning model by importing Torch library. Torch is a machine-learning library useful for creating deep neural networks. The original model

training includes adding several convolution layers as well as batch normalization and max pooling layers.

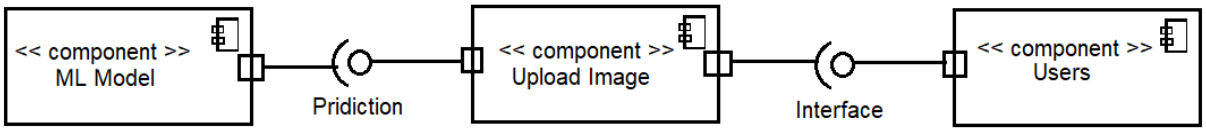
6. Model Evaluation: Evaluate the trained model's performance using test dataset. To evaluate the model's performance, find the losses and accuracy acquired in different batches of test dataset.

7. Deployment: To be used in crop disease detection, import the model to enable it to integrate with the frontend and deploy it.

It's crucial to remember that the aforementioned technique is only a general outline, and the specifics may change based on the demands of the unique application. access to the attendance.



III. MODELING AND ANALYSIS



Below the image of our frontend show how the user can upload the image easily and get the predicted answer and also we create mobile friendly interface, we also provide the supplements also for defected crop.

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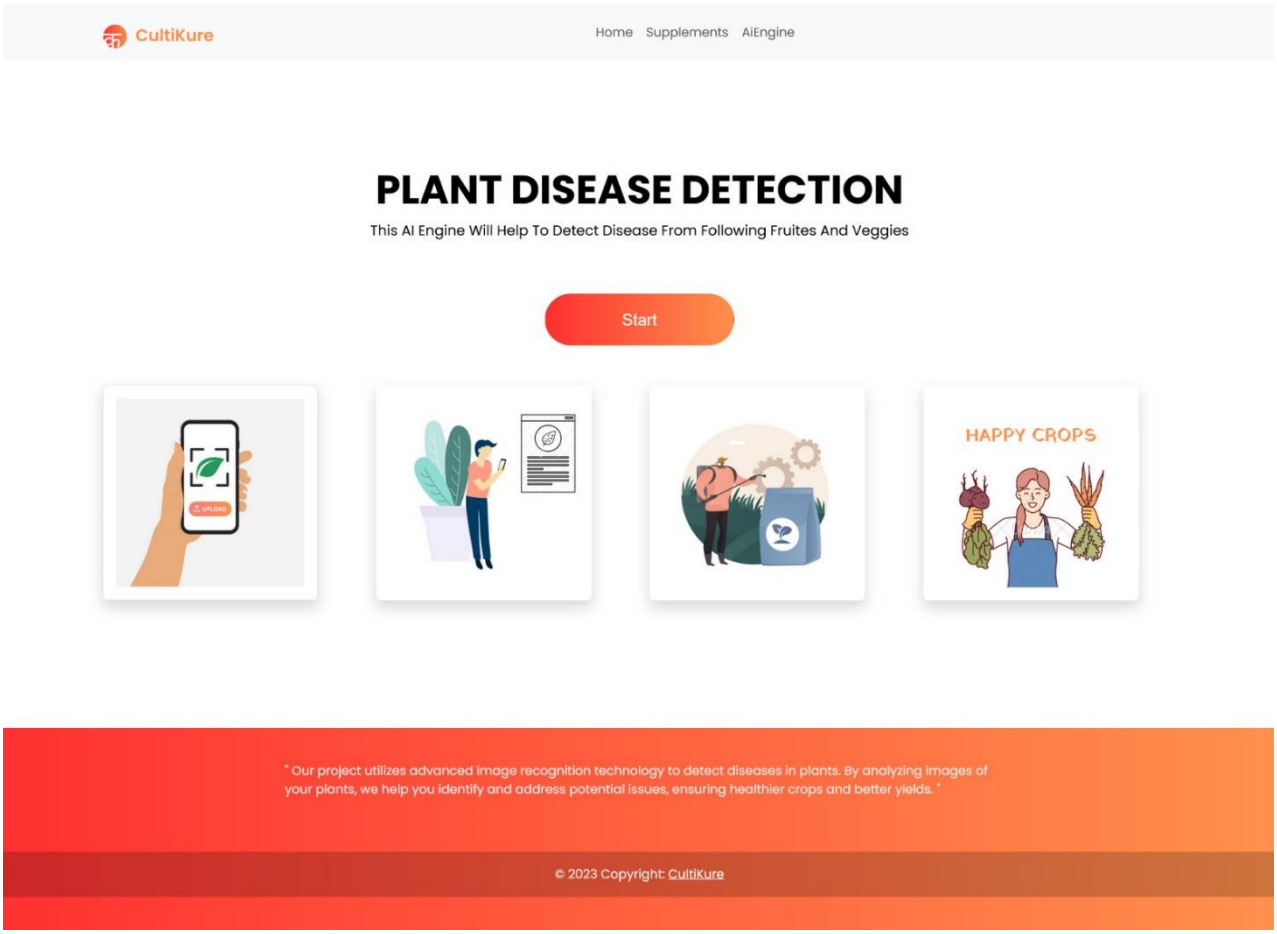

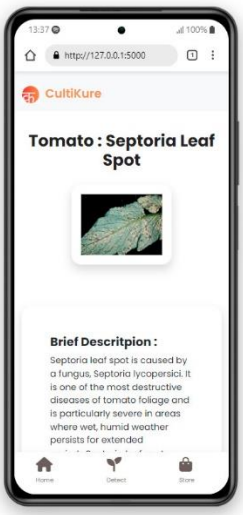

IV. CONCLUSION

The development and application of a Crop Disease Detection System is an advancement, in agriculture and horticulture. This innovative system, which utilizes the power of machine learning and image recognition provides a solution for detecting and managing diseases at a stage. It has the potential to revolutionize farming by not identifying diseases and pests but also offering practical strategies, for disease control and prevention. By addressing the challenge of disease detection and providing recommendations this system can greatly boost crop productivity minimize financial losses and contribute to ensuring food security.

V. ACKNOWLEDGEMENTS

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VI. REFERENCES

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