

APP-BASED SOLUTION TO IDENTIFY & SOLVE DISEASE IN PLANTS/CROPS

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Abstract

Our project aims to develop an innovative app-based solution to identify the diseases and to solve diseases in plants/crops. With increasing challenges and difficulties to farmers at detecting crop diseases, this application will provide a user-friendly experience to solve the problems. Using some advanced technologies like Image Recognition and Machine Learning. In crop fields, due to the crop diseases, there causes a loss of irrigation and farmers get low crop production to yield foods to people. We are providing Computer Vision empowered with Machine Learning. Since some of the diseases almost makes to look similar to farmers that make them confused, which remedy has to be used. We need better and more accurate instructions on how to use fertilisers, to correctly identify diseases, and to be able to tell apart two or more disease types that look similar when seen visually in order to avoid this situation, Convolutional neural networks are helpful in this situation. Using a foreground-based segmentation method and a two-step feature extraction technique, a novel and effective compressed sensing inbuilt plant disease detection device is created that can identify and categorise two of the main banana diseases. Real-time image collection is used to build a database for the diseases sigatoka leaf spot and banana bunchy top. It's critical to identify banana plant diseases early on to prevent significant damage to the plants. This paper offers a resource for early disease. It is suggested to use machine learning to detect banana diseases. The application also offers remedies in accordance with diseases found. Farmers can use the developed mobile application with little to no technical expertise because it is user-friendly.

Keywords : Diseases, user-friendly, Image Recognition, Machine Learning, Computer Vision, mobile application

1. INTRODUCTION

In recent decades, there has been growing issues in agricultural farming due to the plant diseases. It is one of the vital roles in slowing progress to the agricultural yield. It is a major problem for the farmers, and it lead to food scarcity around the world, that makes some of the significant crop loss or plant loss. And some of the new farmers were unaware of the plant diseases already eroded in the plants. Recently, there are number of advancements and interests in using computer vision and machine learning. Some of them can easily be identified the plant diseases by using visual contact (naked eye). But for some, it can be difficult to identify the diseases early, or some of the diseases having same symptoms. By giving the lab testing make solution to that, but it is more expensive and farmers cannot afford to the price to give the samples. To know more about the symptoms and detecting the plant diseases, this project will help us to solve the challenges to detect the plant or crops diseases.

This project can propose the way to give affordable method, by developing a mobile app that uses computer vision and machine learning to detect the plant diseases. Let us taking an example as banana leaves, as the app would allow the users (farmers) to take the photos of the sampled leaves and import it to the app and so it can automatically classify the leaves as healthy or not healthy. It can also provide some of the information about the diseases that have been detected, and how to solve them by some of the suggestions and remedies to use, then giving some of the calculation of usage to pests/fertilizers and having general news about the disease.

1.1 Literature Survey

D.Raja et al., M.Karthikeyan et al., [1] (2023) (International Conference on Sustainable Computing and Data Communication Systems

(ICSCDS)) "It is difficult to identify plant disease early on due to the lack of laboratory resources. Techniques for automatically detecting plant leaf diseases can be used to reduce the task of keeping an

eye on large agricultural farms. Recent advances in deep learning and computer vision techniques have demonstrated the importance of creating an automated plant leaf disease detection model. A model for automatic plant leaf disease classification is presented in the paper. The goal of the PLDC-AAADL approach is to distinguish between damaged and healthy plant leaves. The PLDC-AAADL approach uses the densely linked networks model to generate features.”

Lakshmanarao et al., M. Raja Babu et al., T. SrinivasaRavi Kiran [2] (2021)

(International Conference on Artificial Intelligence and Machine Vision (AIMV)) used for survey where it studied, “Agriculture is a nation's foundation. Agriculture is the primary source of food for humans. Plant disease detection has grown to be a serious concern. It is possible to diagnose plant diseases. Leaf disease detection has typically been accomplished by an empty eye inspection. This method of identifying plant leaf disease can be expensive, time-consuming, and subjective. It also calls for a large number of personnel and a wealth of plant disease knowledge. Plant leaf diseases can be identified with a software programme. Both deep learning and machine learning are applied. Agriculture is one industry that uses machine learning, for the categorization and detection of plant diseases”.

Heri Andrianto et al., Suhardi et al., Ahmad Faizal et al., Fladio Armandika et al., [3] (2020) (International Conference on Information Technology Systems and Innovation (ICITSI)) said, “The most significant factor influencing agricultural yield and quality is plant disease. An agriculturalist is aware that a pathogen could damage his plant. This procedure might be off. Plant illness can be identified using machine learning. We present here our deep learning-based rice disease detection system, which consists of a phone application and a machine learning application running on a cloud server. Images of rice plant leaves can be sent from the cloud server application to the phone application, which can then be used to retrieve data on the different kinds of plant illnesses.”

R. Dhivya et al., N. Shanmugapriya et al., [4] (2022) (International Conference on Knowledge Engineering and Communication Systems (ICKES)) states that, “The global economy is affected by plant diseases. Deep neural network concepts for early disease identification and control are some of the smart agricultural solutions that are emerging. Automatic detection techniques can be used to detect early plant

disease, which can lower costs and increase the quality of food. The paper presented the EVTC neural network model as a useful tool for identifying plant diseases. The accuracy of object detection and image categorization systems has been greatly improved by deep learning in recent years of about 54,305 photos of different plant disease types were used in the studies.”

1.2 Problem Statement

Plant illnesses are a major issue for ranchers since they bring about huge yield misfortunes. Plant sickness identification strategies utilized in the past are work and time-serious. Albeit visual examination is every now and again utilized, it very well may be trying to distinguish infections at a beginning phase when they are generally repairable. Despite the fact that research center testing is more costly and tedious, it can deliver more dependable outcomes. A faster and more precise technique for distinguishing plant sicknesses is required. Contrasted with traditional methodologies, an application-based arrangement could offer different advantages. And taking as most importantly, it would make a great and faster deal for the more straight approach to farmers. Ranchers could utilize their telephone to snap a picture of a plant, and the product would quickly identify any illnesses that are there. The application could likewise be utilized to early recognize illnesses.

1.3 Problem Justification

We recommend fostering a versatile mobile application that utilizes simulated intelligence and PC vision to recognize plant infections. Farmers could utilize the application to snap pictures of their plants, and it would then decide if the plants were solid. Furthermore, the application would give data on the contaminations that have been found and their treatment.

A broad information base of pictures of sound and unhealthy plants would be utilized to foster the application. The names of the pictures would relate to the sorts of sicknesses that are accessible. By examining the features that are removed from the pictures, the application would figure out how to recognize the diseases. The application would work with various cell phones and be accessible in numerous lingos.

1.4 Main Objectives

To develop a mobile application that can identify the diseases in plants and crops using “Image Recognition/Acquisition” algorithm technique. To provide farmers with easy-to-use tool for diagnosing plant diseases and acknowledging about different types of diseases and its symptoms, to make increased productivity.

2. PROPOSED SYSTEM

Utilizing photographs of the tormented plants from a current framework, an AI program might analyze plant sicknesses more precisely than a manual investigation technique that requires particular information.

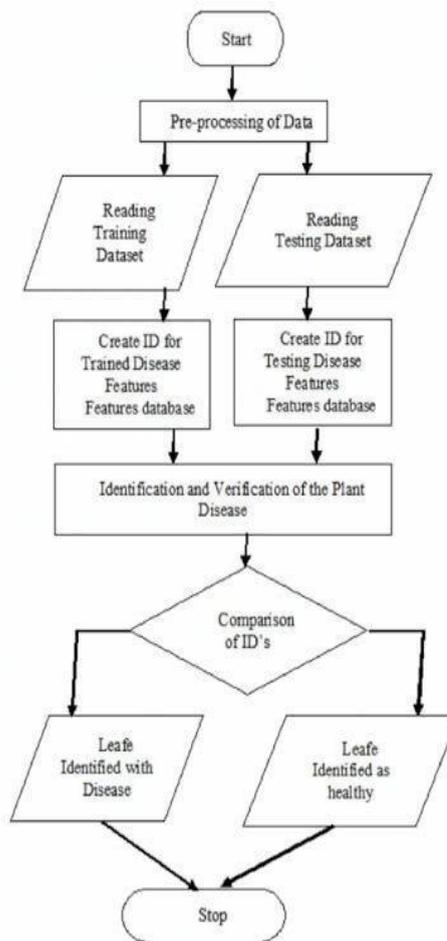
Thought: An assortment of plant animal groups can utilize the proposed way to deal with analyze diseases. Existing strategies could be compelling against a specific plant or illness.

The framework's ability for development: The proposed framework might be scaled to deal with a rising client populace and developing information volume. It's conceivable that ongoing frameworks can't deal with a ton of clients or information.

3. SYSTEM DESIGN

Mobile app: The system's user interface will be the mobile app. Users will be able to photograph plants and submit them for study. The analysis's findings, including the disease's type and recommended treatments, will also be shown on the app.

Server: The server will house both the database of photos of both healthy and diseased plants as well as the machine learning model. Additionally, the server will offer an API so that the mobile application may submit photographs for analysis and get the findings. Machine learning model: A dataset of photos of both healthy and diseased plants will be used to train the machine learning model. By examining the characteristics of the diseases, the model will learn to recognise them.



4. METHODOLOGY

Information Assortment: The initial step included the assortment of a different dataset of plant pictures showing side effects of different illnesses and irritations. This dataset was carefully organized to guarantee its exactness and exhaustiveness.

Data set Improvement: A far reaching plant sickness and irritation data set was made, containing data on side effects, causes, and suggested therapies. This information base filled in as the establishment for the application's illness recognizable proof abilities.

Application Improvement: An easy to understand portable application was created, consolidating picture acknowledgment innovation. Clients can catch pictures of impacted plants and submit them through the application for examination.

Picture Handling: The application uses progressed picture handling calculations to examine the transferred pictures. AI models, prepared on the

dataset, recognize the sickness or irritation influencing the plant.

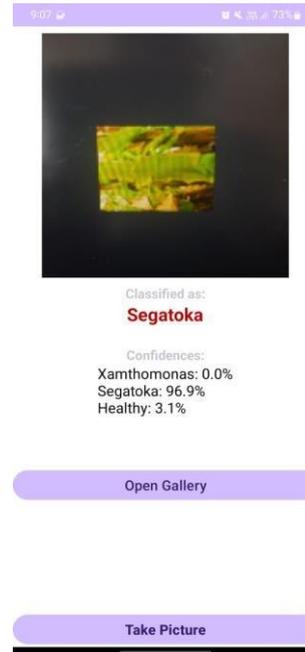
Determination and Proposals: When the illness is distinguished, the application gives clients a finding and gives suggestions for infection the board and yield insurance. These suggestions depend on the data set's data and current prescribed procedures.

Input Instrument: Clients are urged to give criticism on the application's exactness and adequacy. This criticism is utilized for ceaseless improvement and refreshing of the information base and application highlights.

5.RESULT

The application based arrangement showed a serious level of precision in recognizing plant illnesses and irritations, with a typical exactness pace of more than 90% across different yields and conditions. Client input demonstrated an elevated degree of fulfillment with the application's exhibition and handiness.

Ranchers and farming experts found the suggestions gave by the application to be important in overseeing plant sicknesses and limiting harvest misfortunes.



6.CONCLUSION

This task presents a creative and functional answer for tending to establish sicknesses and nuisances in horticulture through an easy to use versatile application. The joining of picture acknowledgment innovation and a complete sickness data set considers exact finding and opportune suggestions. The outcome of this application based arrangement highlights its capability to reform the agrarian area by further developing infection the board, lessening crop misfortunes, and advancing supportable cultivating rehearses.

Future work could zero in on extending the data set to incorporate extra yield assortments and sicknesses, as well as consolidating constant climate and natural information to upgrade the application's prescient abilities. Generally speaking, this examination adds to the progression of accuracy horticulture and fills in as a significant device for ranchers and farming partners in guaranteeing worldwide food security and manageable yield creation.

7. REFERENCES

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