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Plant Disease Detection Robot

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ABSTRACT: The best way to forestall misfortune in gather and number of cultivating items is through sickness identification. Plant sickness is not characterized as an illness that can be recognized by actual irregularities of the plant (like shrinking of leaves). Ill-advised upkeep or confirmation of plant illness can make colossal misfortunes to the ranchers. Plant wellbeing checking and sickness location are vital for maintainable farming. It is undeniably challenging to detect the illness physically for goliath regions. It requires more labor who work in plant sicknesses and furthermore requires really handling time. This will be the most valuable thing for the ranchers to keep up with the strength of the plants. In this work, an advanced plant disease detection robot is proposed based on the concept of digital image processing. The picture obtained is utilized to recognize plant sicknesses. Sickness location includes steps, for example, picture obtaining, picture pre-handling, picture division, highlight extraction, and grouping. The caught picture is handled, and a Short Message Service (SMS) will be sent through the mobile phone. SMS contains point by point data about the illness. It will be simpler and more agreeable to check and ensure huge spaces of plants and their efficiency.

Software :(Arduino/ Node MCU)

KEYWORDS: Webcam, DHT Sensore, Soil Sensore

I.INTRODUCTION

India is a horticultural nation wherein over 70% population relies upon agribusiness. The harvest misfortune is because of ailments around 10 to 30%. Ranchers judge the ailments by their experience, yet it is not the exact and appropriate way. Sometimes ranchers take support from specialists to recognize the ailments, yet this is likewise a tedious way. At the season of review of yield harm, the investigation advisory group faces numerous issues about the distinguishing proof of illness and real rate loss of harvest because of ailment. The primary inspiration of this theme is to distinguish the sort of illness and measure the harm of harvest along these lines giving the conceivable money related assistance or remuneration to endured ranchers. This quick distinguishing proof and evaluation of infection is conceivable by utilizing picture handling strategies on various pieces of cotton crop.

II.LITERATURE REVIEW

Sachin D. Khirade and et al [1] identification of the plant ailments is the way of avoiding the misfortunes in the yield and amount of the farming item. It requires gigantic measure of work, expertize in the plant ailments, and furthermore require the unnecessary handling time. Subsequently, picture handling is utilized for the recognition of plant infections. Malady recognition includes the means like picture procurement, picture pre-handling, picture division, highlight extraction and order. This paper talks about the techniques utilized for the discovery of plant maladies utilizing their leaf pictures. This paper talks about different systems to portion the infection part of the plant. This paper likewise talks about some Feature extraction and characterization strategies to remove the highlights of tainted leaf and the arrangement of plant infections. The precisely discovery and characterization of the plant infection is significant for the fruitful development of yield, and

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this should be possible utilizing picture handling. This paper talks about different procedures to fragment the malady part of the plant. This paper additionally talks about some Feature extraction and order systems to separate the highlights of tainted leaf and the grouping of plant illnesses. The utilization of ANN strategies for characterization of illness in plants, for example, selfsorting out element map, back proliferation calculation, SVMs and so on can be proficiently utilized. From these strategies, we can precisely distinguish and group different plant ailments utilizing picture preparing strategy.

Prof. Sanjay, B. Dhaygude& et al [2] the utilization of surface measurements for distinguishing the plant leaf illness has been clarified firstly by shading change structure RGB is changed over into HSV space in light of the fact that HSV is a decent shading descriptor. Covering and expelling of green pixels with preregistered limit level. At that point in the next step division is performed utilizing 32X32 fixedestimate and acquired helpful fragments. These portions are utilized for surface examination by shading co-event lattice.

III.METHODOLOGY OF PROPOSED SURVEY

The idea at first was to create an android mobile application that will be used by the farmer to help him upload the picture of the unhealthy plant's leaf and receive the type of the disease with the type of pesticide to use and the amount of pesticide that the farmer should not exceed. The MATLAB code will be the software that we will be using to process the image that will be sent to it from the mobile application as input throughout a database using MySQL. After some trials, this idea could not be achieved due to constraints of time as it will require a lot of time from building, executing to testing. Also, we tried to achieve this by using "Thing Speak" which is an IoT cloud platform that is used to analyze and visualize data, but it does not support the upload of images to have a database; therefore, it was not accurate to our system. Then, we thought of another scenario which is making a standalone application using MATLAB that will be a desktop application that the users can download and access it from their computers.

IV. CIRCUIT DIAGRAM

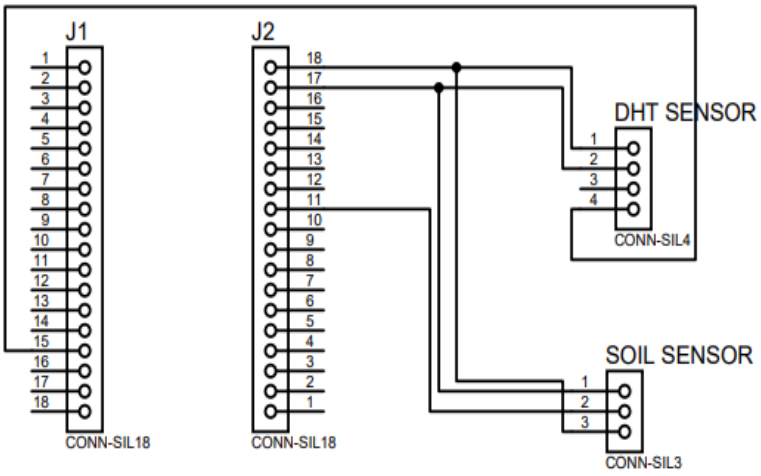

Figure 1. Circuit Diagram

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V.BLOCK DIAGRAM

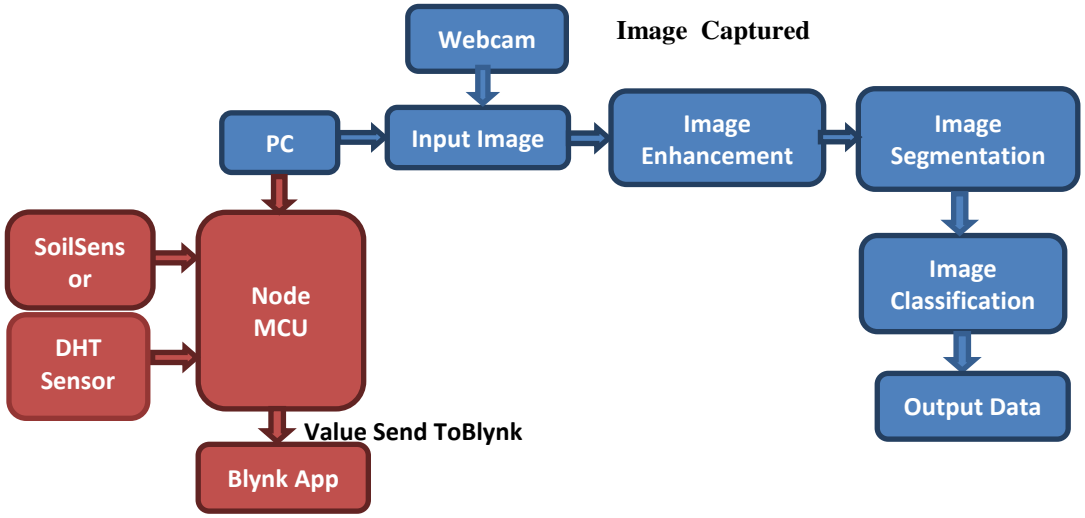

Figure 2. Basic Block Diagram

VI.COMPONENT

6.1 Webcam:A webcam's function is to capture or transmit video to a computer or computer network.They are mostly used for social networking, livestreaming, and security.

6.2Node MCU: Node MCU is an open source platform built on the ESP8266 that allows things to be connected and data to be transferred over Wi-Fi. Additionally, by supplying some of the most crucial microcontroller functionalities like GPIO , PWM , ADC, and others, Many of the project's criteria can be satisfied by it on its own.

6.3DHT 11: This sensor is used in a variety of processes, such as the detection of humidity and temperature in HVAC systems. Weather forecasts are also made using these sensors by weather stations. The humidity sensor is used in homes where humans are affected by humidity as a prophylactic measure.

6.4PC:A personal computer is a versatile, usable, and compact microprocessor that is designed for solitary use. Personal computers are not intended for use by computer professionals or technicians, but rather by average consumers.

6.5Soil Moisture Sensor: Soil moisture sensors keep track of the soil's water content in order to determine how much water is stored in the soil horizon. Water in the soil is not instantly measured by soil moisture sensors.

6.6Blynk app: With the help of the Internet of Things platform Blynk, users with iOS or Android smart-phones may control gadgets like the Arduino, Raspberry Pi, and Node MCU from a distance. You can create a graphical interface or human machine interface by compiling and providing the correct address on the various widgets using this application.

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VII.FLOW CHART

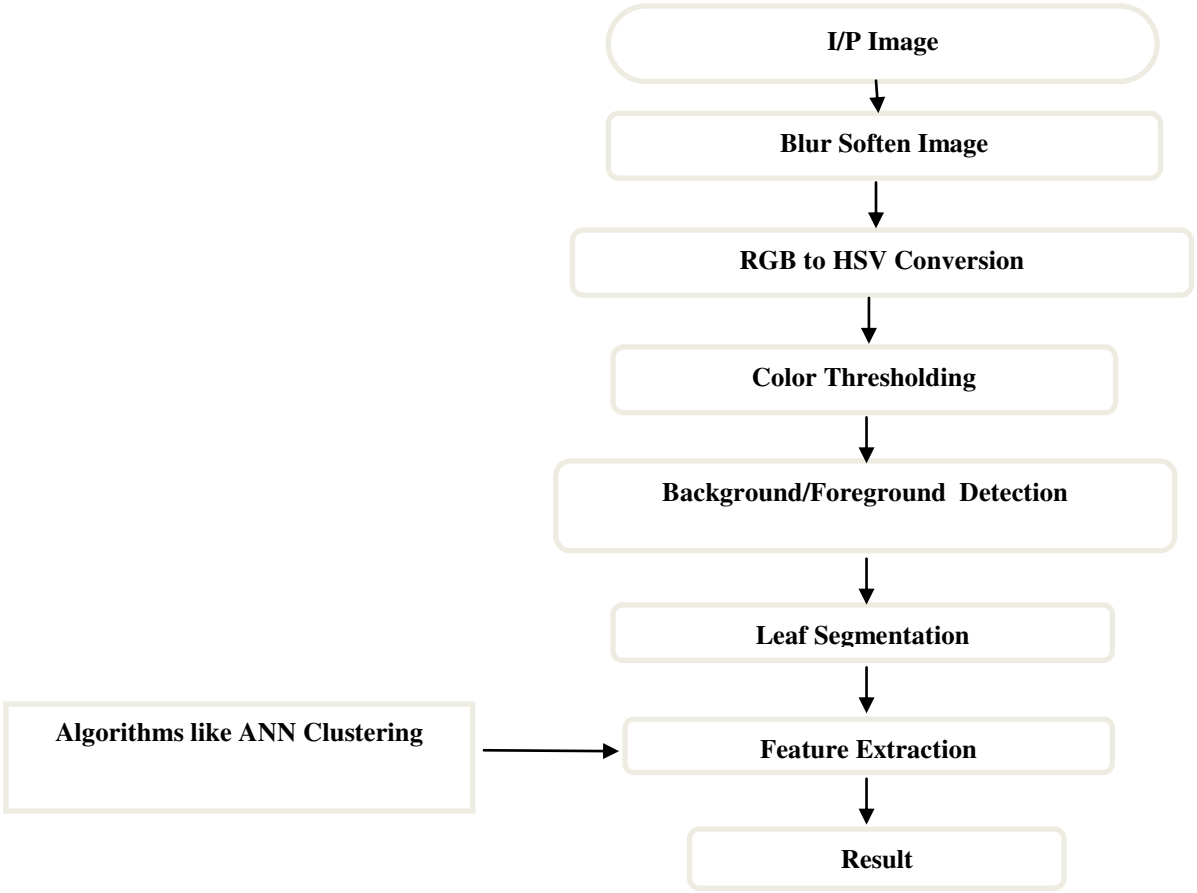

Figure 3. Design Flow Chart

VIII.IMPLEMENTATION

Types of Diseases: It exits different types of diseases that affect the plants. The most common diseases between the plants are Alternaria alternate (fungal), Anthracnose, Bacterial Blight (bacteria), and Cercospora Leaf Spot, Downy Mildew, Alternaria Leaf Spot, Frogeye Leaf Spot, White Spot, Powdery Mildew [5]. In our system we focused only on three types of plant diseases which are the following:

8.1Alternaria Alternata:It is one of the common plant diseases, it is a fungus that cause spots on the plant's leaf, it has bad impacts on both the health of the plant and the human as it may cause for them asthma [5].

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Figure 4. Alternaria Alternata

8.2Bacterial Blight: It is one of the dangerous diseases that can affect a plant's leaf, one of its initial symptomsthat could be visually seen on the plant's leaf is the dark and yellow spots other symptoms could be necrotic blotche[5].

Figure 5.Bacterial Blight

8.3Cercospora Leaf Spot: This type of disease appears and spread in high temperature and humidity. It is characterized by small grey spots on the plant's leaf [5].

Figure 6.Cercospora Leaf Spot

As mentioned above, the proposed system will consist mainly of identifying and classifying the type of disease the leaf is suffering from. This will be implemented using image processing method on MATLAB as a tool to process the images. This process undergoes many steps, and the first step is the data collection.

8.4Data Collection: Our collected data contains different images of the leaf diseases that were taken from the internet, and these images are stored as a database in the computer, and they are used also to train our system along with the healthy leaf images.

IX. STEEPLE ANALYSIS

This steeple analysis part is dedicated to discussing the social, technological, economic, environmental, political, legal, and ethical impacts of our project.

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9.1 Social: The social aspect of this project resides in the fact that it will expand the accuracy results of the detection which will help the farmers to guarantee an efficient production, so that it will guarantee a harmonious family life free of troublesome revenue related problems**.**

9.2 Technological: Recently, much research was conducted regarding this topic using different methods. However, using this technology of image processing will allow to tackle the problem form a different perspective. Also, in this project we will be using dome already invented methods that could be developed. Detecting using image processing is mainly implemented using Python, in this project we will be using MATLAB to discover this technology and see how efficient its results will be.

9.3 Economic: Plant disease detection was always requiring the existence of experts, the thing that costs a lot of money and waste of time as this manual work requires a lot of working and processing hours. Also, the detection is done after the healthy plant are contaminated also. The main purpose of our project is to ensure for the farmer the pre-prediction of the plant disease the thing that will minimize the use of pesticides especially in the monoculture. Therefore, this will increase the profit for any monoculture farming industry as it will guarantee the increase in the quantity of the products that are produced by the monoculture farming industry.

9.4 Environmental: Our project will be very friendly to the environment as it will reduces the use of pesticides and all the chemicals that are harmful for the soil. Also, by monitoring the plants' health will have a positive impact on the cultivation process of the crops.

9.5Political: The food security of a country allows its prosperity and political effectiveness. Solving the plant diseases problem allows for a more stable and prosperous society.

9.6 Legal: This project is considered to be legal as it will be tested regularly, and it will undergo many regulations from the experts to specify the framework in which it will be implemented**.**

9.7Ethical: This project is more ethical from a consumer perspective to buy products with minimum impact of harmful pesticides.

X. RESULT

Figure7.ProjectModel

Plant disease detection robots are designed to help farmers and growers identify and diagnose plant diseases early on, before they can cause significant damage to crops. These robots use various technologies, such as computer vision, machine learning, and artificial intelligence, to analyze images of plants and detect signs of disease.

XI. FUTURE SCOPE

In this investigation, we only highlighted a few disease types that were frequently caused by and it can be expanded in the future to include other diseases. Only diseases are discovered here, but in the future Without human intervention, a robot can be sent to automatically spray pesticides onplants.

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XII. CONCLUSION

In order to diagnose disease in leaves, this project offered a classification of leaf image patterns using a mix of texture and colour feature extraction. The farmers initially transmit a digital image of a plant's damaged leaf, which is read in Python, automatically analyzed using SVM, and the findings are shown. Finding the right traits to recognize leaf illness of certain typically affecting plant diseases is the goal of this study. First, photos of health and disease are gathered and prepared. The shape, colour, and texture features of these images are then extracted through processing.. After that, a support vector machine classifier is used to categorise these photos. The right features are assessed using a mix of numerous features in order to find distinguishing features.

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