

Smart Solution For Agriculture Leaf Disease

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ABSTRACT

India is the Agriculture oriented country. Now a days most of the agriculture depends on technology. Technology makes agriculture easy for farming. In Technology IOT plays important role. With the help of IOT we can implement various technologies which is useful for agriculture. This paper is overview of such implementation. As we Know nowadays due to immense change in climatic conditions farmers faced lots of difficulty while farming. many crops may spoiled due to excess of moisture Over this they are not aware about various leaf diseases and solution over these diseases and solution for this disease. farmers do all these things manually In this paper we are giving solution over leaf diseases by communicating the Farmers with fertilizer companies/industries. Because of this farmers have two benefits. First of all, they get exact information about leaf disease and secondly they are aware about market value of good fertilizer. for this purpose we used Raspberry pi model to store all the information fertilizer and companies.

Keywords: Raspberry pi, Python, Programming, OpenCV.

I. INTRODUCTION

Agriculture is primary occupation among all the occupation in India. It is integral part of the Indian society. According to static reports of Department of Agriculture, Cooperation and Farmers welfare Ministry of Agriculture and farmers welfare Government of India, 54.6% of total personnel is affianced in agricultural and related sector activities(census 2011) and accounts for 17.1% of the country's Gross Value Added(GVA) for the year 2017-2018(at recent prices).Government of India has taken many steps for its development in a tenable manner. In recent years, more changes seen in agriculture. various modern methods were used for agriculture practising. Government also raises their hand for modern technologies. Nowadays agriculture did by smarter ways. For this purpose IOT(Internet of Things) plays important role. Smart farming based on IOT technologies empower growers and farmers to downgrade waste and increases production, by using IOT Farmers can monitor field and crop condition from anywhere. It is highly effective than conventional methods. The uses of IOT based smart farming not only useful for large farming operation but could also be mechanism to boost growing agricultural like organic farming, family farming and increase highly transparent farming.

In earlier days the most used method for leaf disease detection simply observation by experts. by doing this, a large group of experts required. which costs very high for financially backward farmer. leaf disease identification by visual way is more laborious and less probability task. Now a days, due to sudden climatic changes Indian farmer faces lots of problems related with leaf diseases. It degrades the production of crop. because of this farmer didn't get expected value for their crops. Leaf diseases are hard to be identified. but using IOT farmers easily detect leaf diseases.

II. LITERATURE SURVEY

[1] Various researches have been done to detect and identify the disease of the plant leaf. This research has been done specially on the plant leaf using python programming language as a base. Algorithm has been drawn to spot the leaf diseases. The various steps were carried out for finding out the disease by capturing the image of the leaf, processing it and then converting it using a RGB to GRAY converter. The approach is quite easily accessible to the farmer and the one who is using. The results obtained are quite useful since the diseases can be detected on the primary stage itself without much harm to the crop. Hence help save a lot of loss and gain profit overall.

[2] Proposed a work elaborating the use of raspberry pi software for increasing the production rate food processing industry. They have taken five paddy plants to analyse the diseases. The steps used are image acquisition processing segmenting and extracting and again classifying it according to the diseases found. Open CV has been used for used specially for segmented image finding. Two sensors play an important role in this project, the sensors used are temperature sensor and a moisture sensor. The proposed project positively will help in increasing the production and increasing the food processing rate.

[3] This project in short depicts the methodology used for determining the disease and of different species of plants. The method used here is using Python language along with OpenCV software library. Components used are a web camera (2mp) with SD card. Four steps have been carried out which mainly include the image capturing image processing image segmentation and final stage is extraction of the image and finding out the features. The system has also been integrated with various sensors and GSM. Finally a comparison is done using the SIFT algorithm.

[4] It illustrates the internet of things based smart solution for finding leaf diseases. Here moisture sensor, humidity sensor, temperature sensor and raspberry pi are used for collecting and analyzing the data to detect the disease associated to the plant. The information can be

obtained in a short span of time without much efforts. The camera is used to capture image and further its processed and used for detection of the diseases.

[5] From the paper mentioned it is studied that a clustering algorithm has been used for detection of disease in plants and a raspberry PI has been the used. Raspberry PI hardware is used for computing and run programs in python. Technologies used are OpenCV (open source computer vision), Python, Tomcast server. This all have been together to find out the diseases in plant and get direct information to the mobile of the farmer. This will help reduce the disease and give exact details of the pesticide to be sprayed to prevent the attack of such disease and obtain a good yield.

III. PROPOSED METHODOLOGY

In the proposed system we are trying to identify leaf disease of plant using their leaves and gives fertilizers information. For this we have used power supply of 5v/1A.this optimum supply used because of cost efficiency. It is connected to Raspberry pi 3B+.Raspberry pi 3B+ is the latest product which has 64-bit quad core processor running at 1.4 GHz. Here we use 16MP USB camera to capture the image of the leaf. Input switch is also connected to raspberry pi.32GB SD card is used for storing purpose. OpenCV interfaces with python. We have used SMTP for giving Email to farmers as well as used GSM system for giving appropriate information. In our system we have given solution to farmer which fertiliser used for plant to cure the disease on a leaf disease via Email or Short Message Service(SMS).when camera is captured the image, Indicator gives red beam of light while processing is done it gives green beam of light. Moisture sensor can be used to detect the exact level of moisture and such disease associated or occurred due to the high level of moisture content can be detected and cured.

At first ,farmer captures the image then this input goes to raspberry pi(os).Image processing is done with the help of python programming then alogorithm detects and identifies the disease. For this purpose we have stored three levels of images of leaf diseases. Furthermore, this information sent to fertilizer's company through email. They give effective fertiliser information to farmers then this information sent to the farmers by SMS service.

This Project is not only useful for farmers but also for the fertilizer companies to find out solution. In this way appropriate information of fertilizer sent to the farmer via SMS service.

With the use of IOT and its application on the users mobile, constant vigilance is possible.

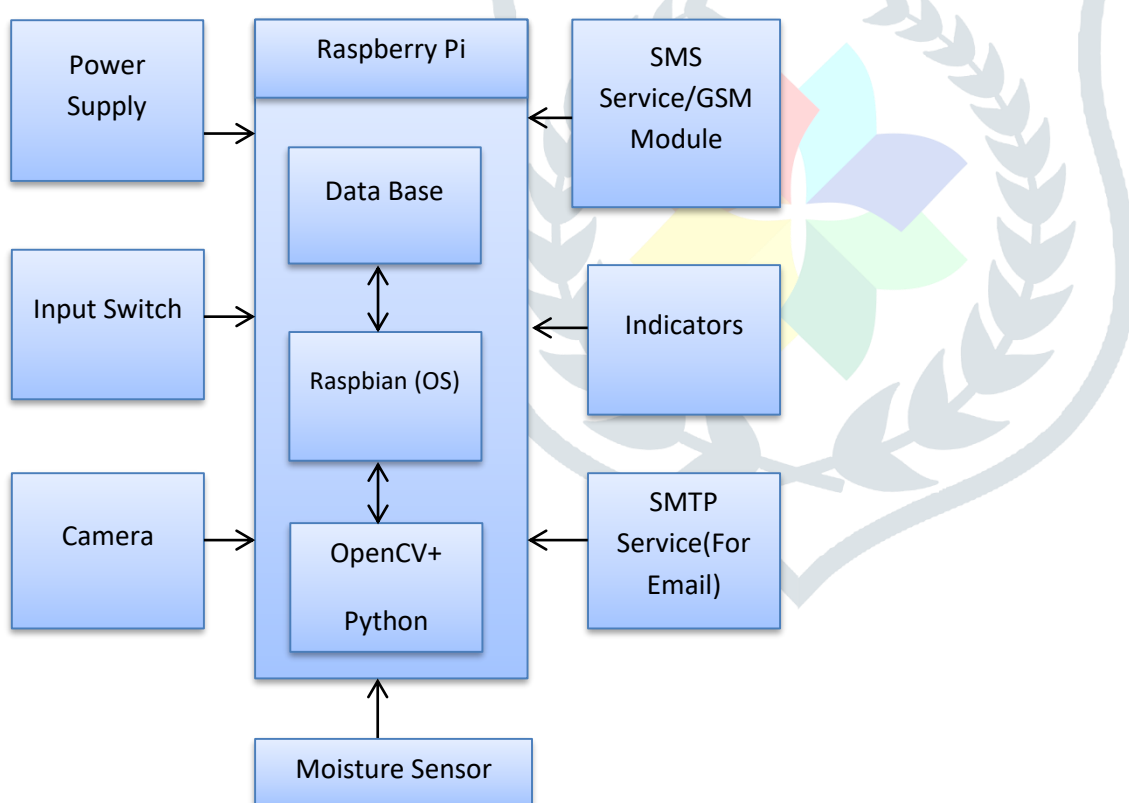


Fig.Block Diagram Of Proposed System

ADAVANTAGES:

- The system can be used both the ways either sending SMS or via Email.
- It detects disease, instantly send message to farmers about disease name and which fertilizer can be used as a solution.
- Farmers also get moisture related information.
- Also agricultural products quality can be improved because farmers observe the qualitative fertilizer.

IV.CONCLUSION

This model is not only limited to farmers only but also to the company manufacturing the fertilizer to implement. This work will enhance the farmers to get exact details along with the curable measures direct from the industry. It connects the broad network between farmers and companies to elaborate the disease of leaf. It gives appropriate market price of fertilizer to farmers.

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