

A Survey Paper on Plants Using IOT

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Abstract

In This Article, Automated system and different taxonomies, the growth of the plant can be monitored. This type of information will be useful to farmers, botanists, and food engineers. In this article we combine Image Processing and the Internet of Things to monitor plant growth and collect climatic factors such as humidity and temperature. In image processing, there is a recognition system that detects the growth of plants using the images of their leaves, so the use of pesticides can be controlled. The system compares the image with those in the database, executing the pre-processing and feature extraction technique to obtain possible matches. In this method we extract the color, texture and shape of the leaf. Based on pattern recognition, a leaf can be identified as healthy or unhealthy. The first sensors are activated, with the help of the cameras, the image is captured and stored for future improvements. After identifying crop diseases using the various imaging techniques, alerts can be sent to farmers. The farmer can see the status of his field even sitting at home using web or mobile applications.

Introduction

In the world around us today we have devices that have the ability to hear, speak, see things, and also process information. These devices are called smart devices. A network of these smart devices for sharing the information they collect or process is called the Internet of Things. Image processing is a method of converting an image into digital form and performing some operations on it, in order to obtain an enhanced image or extract useful information from it. It is a type of signal dispensing in which the input is an image, such as a video frame or a photograph, and the output can be an image or features associated with that image. Usually refers to digital image. Digital image processing uses different computer algorithms to perform image processing on digital images. India is a country of agriculture. Agriculture plays a vital role in the Indian economy. About 70% of the Indian population depends on agriculture. Since 2010, the rate of crop production has decreased due to weather

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conditions, crop diseases, rodents, improper use of fertilizers or low soil fertility, etc. Today, farmers use different types of pesticides for crops at regular intervals. If pests and diseases are present on the plant, it will affect the cultivation rate. It reduces crop yields by a significant amount, and as a result, there will be an increase in poverty, food insecurity and the death rate. At present, the system used to solve the problem is visual observation, which has a drawback as it is time consuming. To overcome this problem, the solution for this is to introduce IOT with the help of image processing. In this procedure the cameras will be installed in different locations in the field and you will capture the images frequently. With cameras, the sensors are also introduced in many places, the sensors will collect the information about the moisture in the soil, the temperature, the humidity and various other agricultural parameters.

Survey on Plants

in this paper highlights the various studies of IOT techniques with help of image processing to detect disease of the plant they are as follows. According to Vijay Singh et al Automatic detection can reduce the disease of the plant using these techniques

Image processing - It is the technique used for measuring affected area of disease, and determining the difference in the colour of the affected area.

Image segmentation – this involves separating or grouping of images. This can be done by simple thresholding method or advanced colour image segmentation methods. Humans can easily detect these but it is not possible for a system to detect this. Hence different methods have been developed. The process of separation is based on various features already present within the image.

The disease detection follows following steps: Image acquisition, Image enhancement, Noise reduction, Image segmentation, Feature extraction, Classifier, Detection. The author also mentions about various disease detection methods: Hybrid method of Noise reduction, Genetic algorithm for segmentation, K-means clustering techniques, K Nearest Neighbour (KNN) for classification, Naïve Bayes Classifier, Support Vector Machine (SVM), Decision Tree classifier (DTC), Recurrent Neural Networks According to Shima Ramesh et al, modern methods such as machine learning and deep learning algorithm have been used to increase disease recognition rate. Random forests method is as a whole, learning method for classification, regression and other tasks that operate by constructing a forest of the decision

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trees during the training time. Unlike decision trees, Random forests overcome the disadvantage of over fitting of their training data set and it handles both numeric and categorical data.”

According to author Lakshmi et al, the following steps are followed, you have an image processing step which is connected to an IOT sensing network. Both these steps are then combined together leading to data analysis and data comparison. Then the data is transferred to farmers or an automatic system which will implement the necessary actions. What the system requires is the physical hardware like camera, humidity sensors, temperature sensors and an algorithm to compare all the data. Image segmentation also needs to be. You need a setup so as to store data for future comparison

The proposed system works on the basis of user validation. When the user validates the system all the connected sensors and cameras are activated and the information is sent to cloud server for comparison with the previous results and decision making and the farmers are informed through web and mobile applications. The process starts with Validation, Initialization of system, Sensors-temperature, moisture, water level, rain detector and cameras, Server, Data analysis, Comparison and decision making.

Conclusion

Agriculture is the main source of food. To improve the output, we need to control the diseases. This can be done by studying the leaf patterns, previous data on diseases, recording the present condition of leaves and comparing the data. This can be done manually but will require a lot of effort money and man power. Instead we can automate the system with the help of cameras and sensors, they can be used to collect data and this data can be compared with previously collected data with the help of an image processing algorithm. Then we can use another algorithm to directly taking action like spraying pesticide or communicating the data to the farmers directly. We can also improve the process by using temperature and moisture sensors.

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