



Intelligent Farm House Automation Using Green House Method and Plant Image Processing Using MATLAB

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ABSTRACT: Automation of the farm land is playing a major role in production of food materials nowadays. In this paper, the below algorithm gives about how the farm house automation is done using green house method. It enables to automatically control the temperature, soil moisture and light content. It also automatically detects the plant diseases and provides security issues. Using the temperature sensor, soil moisture sensor, LDR we can automatically detect the above parameters. Using MATLAB, we can detect the plant disease using neural networks. The above all actions are periodically updated and sent to mobile via GSM modem.

KEYWORDS: Temperature sensor, soil moisture sensor, LDR, plant disease detection, security.

I.INTRODUCTION

Nowadays almost all the vegetables and fruits produced contain toxic fertilizers and chemicals. So peoples are now depending for organic food products. The best and cheapest way to produce organic products by themselves is by growing the vegetables and fruits in their own farm land using green house method. As we can't able to continuously monitor the plants, we need to go for automation. The algorithm that we have produced now gives a cheapest method for the growth of plants.

In this the temperature sensor detects the temperature, soil moisture sensor detects the moisture present in the soil and LDR helps to detect the presence of sunlight. Security is provided using a locker system. The image of the plant is captured and then the image is segmented, filtered and compared with the normal plant image to detect any disease has been affected to the plant. This is carried out using MATLAB.

II.EXISTING SYSTEM

In the existing system, the temperature, humidity, light content are measured and the reactive response such as turning on the heater, and motor are carried out. Similarly plant disease is detected.

DISADVANTAGE:

- ✚ We can't able to determine what process is taking place and what is the present condition of the growth, till we go and see there. So waste of time.

III.PROPOSED SYSTEM

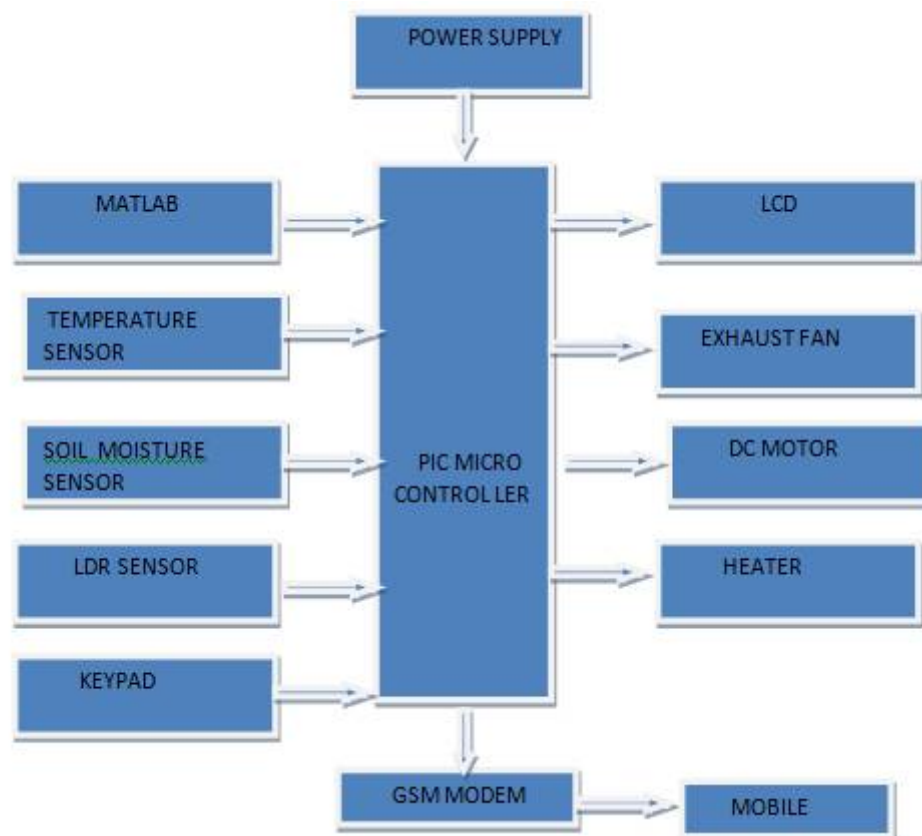
In the proposed system, we have combined both the embedded and MATLAB. The present information's are updated to our mobile via GSM modem. . All the temperature level, soil moisture level, light detection, security and the plant disease that has been detected will be continuously displayed on the LCD and the message is send to the mobile via GSM.

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IV. SYSTEM MODEL AND EXPLANATION



In our system we are going to implement temperature sensor [A], soil moisture sensor [B], LDR[C], and we are also implementing a security for the farm land. The plant disease can be detected using MATLAB [D]. Here we are placing a keypad in the entrance of our farm land, so that only authenticated person can able to go inside. If the correct password is pressed, the system is unlocked and the door will get opened, correspondingly message will be sent to the authorised mobile. If the wrong password is pressed then the alarm will get on, to alert that some unauthorised intruder has entered the system. On parallel message will be sent to the mobile regarding the wrong password.

[A].TEMPERATURE SENSOR

The temperature sensor (LM35) ,senses the temperature. If the temperature go beyond the threshold it will automatically turns on the exhaust fan, till the temperature attains the normal mode. The temperature in the farm land is automatically updated to our mobile via GSM modem.

[B].SOIL MOISTURE SENSOR

The soil moisture sensor senses the moisture present in the soil. If the water level becomes low, then the motor turns on. If the sufficient level of water is reached, the motor will be switched off automatically. The turning on and off of the motor will be send to our mobile via GSM modem.

[C].LDR

The property of the green house system is to keep that environment warm. The LDR will automatically sense the presence of sunlight. If the light intensity decreases, the resistance decreases and the heater will be turned on. The change in the light intensity is notified to our mobile via GSM modem.

[D].PLANT DISEASE DETECTION

The plant growth is continuously monitored using camera. If any disease seems to be infected, then the image of the plant leaves that has been affected is captured via the camera and is processed using matrix laboratory (MATLAB).

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First the image captured is converted from RGB to grey and it is then segmented using K mean algorithm. By the K mean algorithm, we find the Euclidian distance, which gives the diagonal component that determines whether the leaf is infected or not.

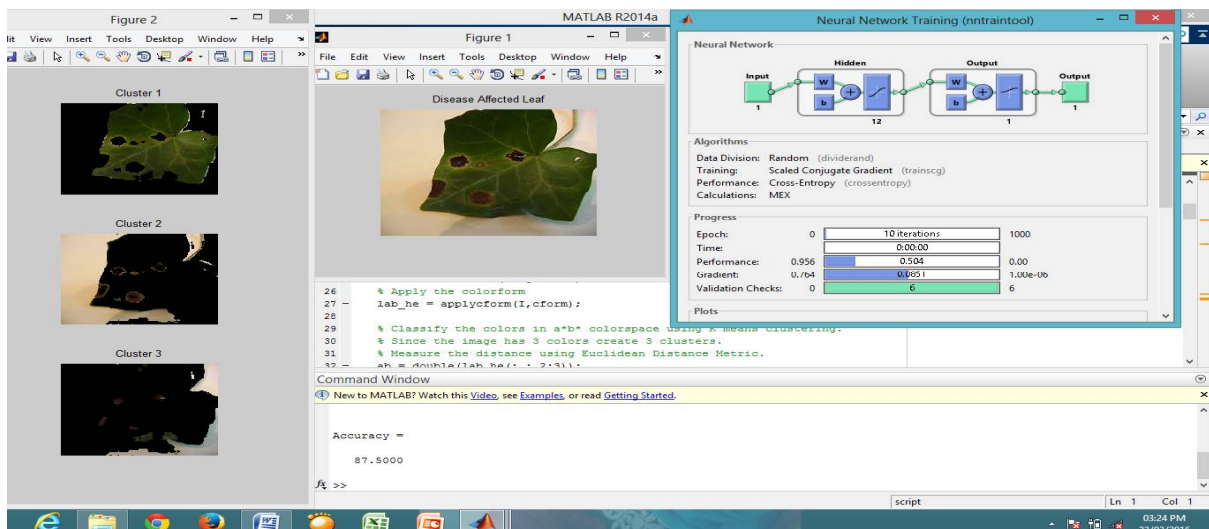


Here we are using the Principle Component Analysis Algorithm in order to detect the leaf disease.

V.RESULT ANALYSIS AND DISCUSSION

The result of all the sensors is displayed in LCD through the microcontroller and it sends the message when the threshold goes beyond the certain level to our mobile via GSM modem.

In the plant image processing, we are using Principle Component Analysis (PCA) algorithm, which determines energy, contrast, correlation, homogeneity, mean, entropy, Root Mean Square, accuracy. The result of the plant image processing is sent to the Programmable Interface Controller (PIC) micro controller. The microcontroller detects the presence of the signal and sends a message to the mobile via a GSM modem.



(a). Result analysis for plant image processing

VI.CONCLUSION

In this project we are allowing the user to set the threshold conditions appropriate to environment in which the crop is growing. If the soil moisture is low, then pump will turn on. If the temperature is high, exhaust fan will get turned on. If the light intensity is low, it will turn on the heater. All the reactions will send to the mobile via GSM. Similarly plant disease will be detected and send to the mobile via GSM modem.



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