GREEN-HOUSE CONTROLLING AND MONITORING SYSTEM

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ABSTRACT:

Recently, Internet of Thing technology has been used to develop numerous applications, this paper compromising design and implementation of greenhouse prototype that integrated with the IoT to adjust the system's parameters and monitor the system status from any place in this world. This system involves three intelligent controllers that designed to stabilize the temperature degree, water level in soil, and light intensity inside the greenhouse prototype structure. These systems have been built by two important parts: the hardware and software.

The hardware part could be achieved by designing and implementing the control circuits, actuators, and install the sensors as well as the devices. The second one is the software part which is involves implementing Fuzzy Inference Engine that represent the system's brain that monitor and manage the entire process in the system to ensure the best performance. This system has been built to contain three control systems that means there are three different Fuzzy controllers. In order to keep the system practicality, the fuzzy controllers should be aggregated in single code that resides in single microcontroller chip with additional codes that perform the IoT duties. The proposed IoT system provides the ability for specific people to monitor and manage their systems remotely.

INTRODUCTION:

IoT Technology has been used to reduce the distance between the staff in the article "Things" and its digital impersonation in data frameworks. It's seen as the Next Generation Network (NGN) of the internet.

The IoT is driven by an extension of the Internet through the incorporation of physical articles joined with a capacity to provide more quick-witted administrations to the earth as more information ends up noticeably accessible. Several application areas going from Green-IT and vitality effectiveness to coordination's are now beginning to profit by Internet of Things ideas.

A Green-house provides basic methods for employment to its proprietor and must be financially pragmatic for the specific atmosphere in which it stands. Also, Green-house could be defined as advanced Innovation for Protected

Horticulture addresses the major natural elements of light, temperature, and irrigation.

This paper investigates the usefulness of using the IoT based on the greenhouse to utilize low-cost tools and decrease the effort of the Pleasant. This could be implemented by including the automation in irrigation process, conserving temperature, and the degree of brightness inside the greenhouse structure.

More recent attention has been focused on the provision of improvement on the Internet of things (IoT) and how to utilize it with the various applications. The IoT is interesting subject that recently whiteness very large number of papers that aimed to develop this technology. in next paragraphs, several papers about the greenhouse with IoT should be presented.

In 2015, L. Dan et al. presented their paper that cantered on using the CC2530 as core chip and introduces a monitoring system design for greenhouse depends on the ZigBee technology. A terminal node sends the temperature to intermediate node by the wireless network, and this node collects all data and sends them to the PC.

OBJECTIVE OF THIS PROJECT:

- Recently, the developments in the field of the IoT technology have led to renewed interest in developing the greenhouse technology.

- The pleasant was complaints from several things such as keep track the irrigation process and having to do it manually. Also, the plants may suffer from bad circumstances like temperature and light.
- The major objective of this paper is to develop practical smart greenhouse with three intelligent control systems in order to obtain suitable circumstances.
- The proposed system has the ability to monitor and control the greenhouse from any place in the world. depicts the block diagram of the entire system.
- The overall designed system could be divided into three important parts; hardware, software, and IoT structure.

REVIEW OF LITERATURE:

Since 1990‟s, for greenhouse and environment monitoring various kinds of systems have been developed. But due to lack of awareness, cost and implementation factors, these systems were left behind. Later a DSP based prototype Greenhouse Environment Monitoring system developed in 2010. Then in 2012, a Digitally Greenhouse Monitoring and Controlling System based on Embedded was developed. This system used a low power, cost efficient chip, microcontroller-based circuit to monitor and record the values of humidity, moisture to achieve maximum plant growth.

Bharat Institute of technology issued a report on „The Project Green Bee‟ based on Monitor and Control of greenhouse environment. According to the report, the system is modelled for Pradeep Kasale et al, International Journal of Computer Science and Mobile Computing, Vol.4 Issue.3, March- 2015, pg. 68-71 © 2015, IJCSMC All Rights Reserved 69 the automation of greenhouse using embedded system.

a Zigbee based Greenhouse Monitoring and Controlling system was developed in 2013[9]. But the problem exists with Zigbee, it is not easily available. In this project Android application is used for the maintenance and control of greenhouse, which is easily available in most of the smartphones and easily upgradable. Due to automated wireless connection technology, it reduces manpower and provides better accuracy.

J. Gutiré rez, J. F. Villa -Medina, A. NietoGaribay and M. Á Porta-Gándara, "Automated Irrigation System Using a Wireless Sensor Network and GPRS Module," in IEEE Transactions on Instrumentation and Measurement, vol. 63, no. 1, pp. 166-176, Jan. 2014.

B. Balaji Bhanu, M. A. Hussain and P. Ande, "Monitoring of soil parameters for effective irrigation using Wireless Sensor Networks," 2014 Sixth International Conference on Advanced Computing (ICoAC), Chennai, 2014, pp. 211-215.

S. Khriji, D. E. Houssaini, M. W. Jmal, C. Viehweger, M. Abid and O. Kanoun, "Precision irrigation based on wireless sensor network," in IET Science, Measurement & Technology, vol. 8, no. 3, pp. 98-106, May 2014.

Bartok, J.W., Jr. 2005. Fuels and Alternative Heat Sources for Commercial Greenhouses

Clean and Green, Water Quality Action Manual for Greenhouse and Nursery Growers, 1992 Horticultural Water Quality Alliance. Printed by Florists' Mutual Insurance Company

Faust, J. E. and E. W. Irrigation Water Quality for Greenhouse Production, Agricultural Extension Service, University of Tennessee. http://www.utextension.utk.edu/publications/pbfiles/pb1617.pdf

Robbins, J.A. and M. R. Evans. Growing Media for Container Production in a Greenhouse or Nursery, University of Arkansas Division of Agriculture, Cooperative Extension Service https://www.uaex.edu/publications/pdf/FSA-6098.pdf

Agriculture Environmental Management (AEM), AEM Tier II Worksheet, Fertilizer Storage & Handling in the Greenhouse https://www.nys-soilandwater.org/aem/forms/GreenhouseFertilizerStorage6-05.pdf

RESULT AND DISCUSSION:

- Measure the Moisture of soil, temperature and humidity Presence in atmosphere and LDR sensor sense the sunlight is present or not.
- If the parameters are not satisfied, the light will glow and the fan is on to control humidity and the heater is on to control the temperature and the motor starts watering the Plants.
- The earliest from of green-house technology probably involved so much people, they are carrying bucket of water to plants, crops, trees etc. and they have to care their plants in green-house. But now we can control and monitoring our green-house by server and not so much people are needed.

CONCLUSION:

The environment where plants are grown in is the driving force behind the development of plants. The environments consist of many different factors that affect the developmental process of plants in a more or less strong way. Not only that various environment factors are interrelated and they cannot be considered singly without regard to the effect on the others, as well as the total effect on the plant. Some of these relationships are obscure, others are clear but all are easily overlooked. Therefore, a good understanding of the effects of these climate factor and their relationships will allow for prevention and early detection of any potential problems.

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