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Article

IoT Based Smart Security and Monitoring Devices for Agriculture

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A B S T R A C T

In the real world, many farmers face problem in monitoring their farms. The farmers have more difficulties to monitor all the farms at the same time. Hence the project is developed to monitor the farms in the field using the concept of IoT(Internet of Things). Temperature level, soil moisture and water level are monitored according to the readings of these sensors and the pump is switched on to provide adequate water to the fields. Here all the data‟s are parsed into the server and are able to monitor the plants continuously and easily able to monitor the health of farms. By using the IoT, the development time gets reduced and thus time for monitoring the farms. Also need not to worry about the health of crops and the readings are displayed in the server automatically through the wireless network. The pump can be switched ON or switched OFF from any part of the world using the concept IoT (Internet of Things). Moisture sensors sense the soil moisture content and switch on or off the pump according to the readings displayed in the web page. Temperature sensor sense the heat in the atmosphere, according to the climate, the switch will be automatically ON/OFFmotor.

Keywords: PIC(Peripheral Interface Controller), IoT(Internet of Things), Sensors used for temperature moisture. A/D(Analog to Digital converter), Wi-Fi(Wireless Fidelity), SQL(Structured Query Language), HTML(HyperText Markup Language), PHP(Hypertext Preprocessor)

Introduction

Agriculture area being the foundation of the Indian economy merits security and consequently a rural item needs security, checking and support at extremely introductory stage. These difficulties ought to be contemplated. The blend of customary strategy with programming advances like Internet of Things and Wireless Sensor Networks can prompt farming turn of events. Keeping this situation the idea “Internet of Things” have been tried and broke down dependent on the gadget and is fit for analyzing the sensed information and then sending it to the client. This venture can be utilized to control and screen the farming fields from far off area. This proposed framework is arranged to give brilliant water system and conveying ongoing warning based on information analysis and processing without human intervention. There are number of other factors that decrease the productivity to a greaterextent.

Hence automation must be implemented in agriculture to overcome these problems. So in order to provide solution to all such problems, it is necessary to develop an integrated system which will take care of all factors affecting the productivity in every stage. But complete automation in agriculture is not achieved due to various issues. Though it is implemented in the research level it is not given to the farmers as a product to get benefitted from the resources. Hence this paper deals about developing smart agriculture using IoT and given to the farmers.

Methodology

Introduction

In this chapter, the methods that available to involve in monitor and security system that given to agriculture field has to be discussed.

What is IoT?

Web of Things generally helps in automation. It acts like an interfaces between actual item around us. Electronic contraption like microcontroller embedded inside actual dissent continues like a veritable inquiry and starts passing on. According to number of things related with web will outperform no .of people on earth in not all that removed future. Cisco Internet Business Solution Group assessments that total related things will arrive at 50 billion out of 2020. Basically significant goal of IoT is to interface everything around us and enable steady correspondence between them with particularly least human intervention. It focuses affiliation at whatever point, wherever with anything.

Method Description

In terms of security aspect IR/PIR sensor is used to identify the animals and human entry in the field and buzzer is used in altering them. While looking in terms of monitoring aspects the presence of water in the well is monitored and then the moisturizing level of the soil and the temperature of the surroundings are monitored. These values are monitored byusing can be controlled based on temperature and moisture level. The water level in the well is stated in two states as F (full/water present) and E (Empty state). If the water level is monitored as empty instead of pump motor is used for water extraction. In case of intruder the farmer will be alerted through webpage. Here when the intruder arrives the buzzer will be alarmed to scare the animals and give initial level of security. Then by using WIFI Module the values are stored as the data‟s are updated for every minute.

Simulation and Results

Proteus 8 is one of the most effortless reenactment programming for different applications and circuit chart of microcontroller. It has practically all microcontrollers and electronic hardware promptly presence in it and henceforth it is generally utilized for reenact the program. The recreation has been done to check the achievability of the proposed work. It very well may be utilized to test programs and inserted plans for electronic before genuine equipment testing, The reenactment of programming should likewise be possible in Proteus.

Hardware & Software Implementation

- Hardware Implementation

In this chapter, the hardware implementation of smart irrigation system has been discussed. The components that are used for sensing and monitoring are connected to the controller. The display, Wi-Fi module and even the motor using driver is connected to PIC. Temperature and moisture level that are sensed by using respective sensors are parsed to web server using IoT.

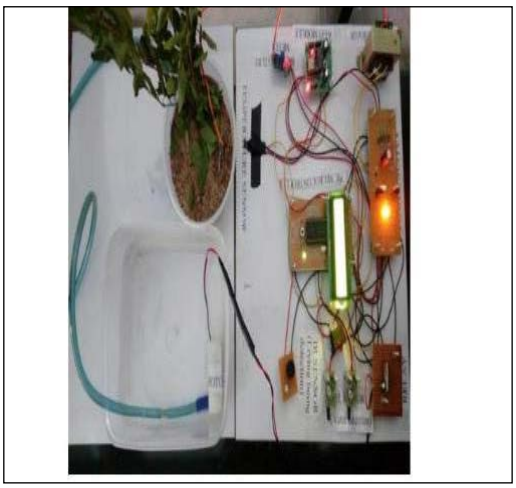

Figure 1.Hardware working model of smart irrigation system

The server can be accessed by the user manually or automatically it is operated to control the motor. LCD shows the entire qualities and checking data for simple access. x Temperature and dampness sensor are plunged into the horticulture field. Temperature and dampness level are detected by utilizing sensors and the qualities are parsed to the web worker and versatile utilizing HOTSPOT and IoT. The worker can be gotten to by the client to control the engine. The engine ON/OFF control is given to the worker. By utilizing IR sensor the passage of intruders, Animals and bugs are recognized and an alarm message is send. Then the user can start buzzer to give an alarming signal. The IR sensor is used to indicate the water level that is used to switch ON/OFF the motor. The XAMPP control panel is used here to display the temperature, moisture, date and time, water content and security notifications to the user. Here the working model shown in fig 8 consists of connection made in the hardware components and the components names are labeled below each component. Here the submerge pump is kept in the water tank from where the water is taken out and moisture sensor is kept near the plant which automatically controls the pump by keeping the moisture value. Here LCD will be used for monitoring the temperature, moisture and motor status.

PIR Sensors

PIR sensors don’t identify or gauge heat, rather they recognize the infrared radiation produced or reflected from an item. It is utilized to identify the development of the individuals, creatures or different articles. They are usually

utilized in criminal cautions and consequently enacted lighting framework. At the point when the human passes in the field, the temperature by then will ascend from room temperature. The sensor changes over the subsequent change into an adjustment in the yield voltage and this triggers the identification.

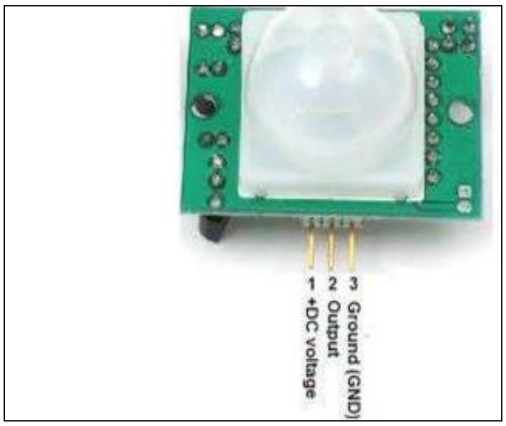

Figure 2.PIR Sensors

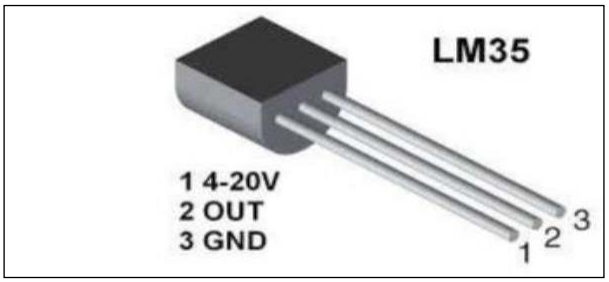

Figure 3.Temperature Sensor

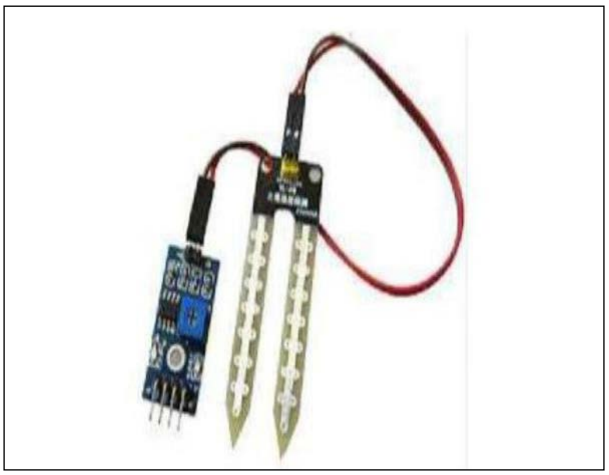

Figure 4.Soil Moisture Sensor

Soil moisture sensor is a sensor which senses the moisture content of the soil. The sensor has both the analog and the digital output. The digital output is fixed and the analog output threshold can be varied. It works on the principle of open and short circuit. The output is high or low indicated by the LED. When the soil is dry the current will not pass through it and so it will act as open circuit. Hence the output is said to be maximum. When the soil is wet, the current will pass from one terminal to the other and the circuit id said to be short and the output will be zero.

- Software Implementation

The Webpage that is designed using PHP server and UI design of the webpage is done using HTML and CSS styling is done using Bootstrap files .The coding used for UI design of the webpage is given as below: UI designing consists of three pages based on the application. The first page is Log in page. It consists of username and password. The list of users to access the webpage and the password for the respective users are stored in MySQL database. The server is contained with data from MySQL database that was named here as IoT. The second page consists of list of fields that need to be accessed and are represented by the diagrammatic images. The third page consists of details of the monitoring sensors values and the status of the pump is embedded into the table.

Conclusion

This proposed work is made to help the farmers and make their harvest economical by helping them in security purpose travelling side, college and for every bodies etc. By this work, the wastage of water and the consumption of power by motor can be reduced so that they are conserved for the future use. This system provides complete monitoring action of sensors in fields that is extremely easy to control the field. It also provides huge security to the plants.

References

1. Gondchawar N, Kawitkar RS. IoT Based Smart Agriculture. *International Journal on recent and innovation trends in Computing and Communication* 2016; 5(2): 177-181.
2. Jain A, Sharma B, Gupta P. Internet of things: architecture, security goals and challenges-A survey. *International journal of innovative research in science and engineering* 2016; 2(4): 154-163.
3. Lee M, Hwang J, Yoe H. *Agricultural Protection System Based* onIoT.
4. Arias JFC, Barajas YJC, Lopez JLR. Wireless Sensor System According to the Concept of Internet of Things. *International Journal of Pure and Applied Mathematics.*
5. Devi VV, Kumari GM. Real Time Automation and Monitoring Systemfor Modernized Agriculture. *International Journal of Review and Research in Applied Sciences and Engineering* (IJRRASE) 3: 7.
6. Devi VV, Kumari GM. Real Time Automation and Monitoring Systemfor Modernized Agriculture. *International Journal of Review and Research in Applied Sciences and Engineering* (IJRRASE) 3: 7.
7. Liu C, Ren W, Zhang B et al. The application of soil temperature measurement bylm35 temperature

sensors. *International Conference on Electronic and Mechanical Engineering and InformationTechnology*.
8. Dave E. The Internet of Things How the Next Evolution of the Internet Is Changing Everything.
9. Lee M, Hwang J, Yoe H. Agricultural Production System Based on IoT, Computational Science and Engineering (CSE), 2013 IEEE 16th International Conference.