



A Survey on Smart Agriculture Monitoring System

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ABSTRACT

Agriculture is done in every country from ages. Agriculture is the science and art of cultivating plants. Agriculture was the key development in the rise of sedentary human civilization. Agriculture is done manually from ages. As the world is trending into new technologies and implementations it is a necessary goal to trend up with agriculture also. But now due to migration of people from rural to urban there is hindrance in agriculture. So to overcome this problem we have proposed an IOT and smart agriculture system. Where IOT plays a very important role in agriculture, IOT sensors are capable of providing information about agriculture fields. This IOT based Agriculture monitoring system makes use of wireless sensor networks that collects data from different sensor deployed at various nodes and sends it through the wireless protocol. And it is powered by Arduino. It consists of temperature sensor, humidity sensor, water level sensor, PIR sensor and GSM module. When the IOT based agriculture monitoring system starts it checks the water level, humidity and moisture level. It sends SMS alert to the phone about the levels of the water. And controlling these parameters are through any remote device or internet services and the operations are performed by interfacing sensor, Wi-Fi, camera with micro controller. This concept is created as a product and given to the farmer's welfare.

Key words: GSM modem, Soil Moisture Sensor, PIR Sensor, Humidity Sensor, Temperature Sensor, WI - FI Module.

INTRODUCTION

As the world is trending into new technologies and implementations it is necessary goal to trend up in agriculture also. Agriculture is considered as the basis of life for the human species as it is the main source of food grains and raw materials. Where it plays vital role in the growth of country's economy. It also provides large ample employment opportunities to the people. Growth in agriculture sector is necessary for the development of economic condition of the country. Unfortunately, many farmers still use the traditional methods of farming which results in low yielding of crops and fruits. But wherever automation had been implemented and human being had been replaced by automatic machineries, the yield has been improved. Hence there is need to implement modern science and technology in the agriculture sector for increasing the yield. Where technology is rapidly growing and new inventions are being created day by day even then farmers are facing a lot of problem about their fields. This is the duty of an every individual to create an environment where farmers must feel comfort and good production and mainly protecting their fields from different mammals.

LITERATURE SURVEY

Authors J Gutierrez, V Medina and M Gandara presented "Automated Irrigation System using a Wireless Sensor Network and GPRS Module". To optimize water use for the agricultural crops, an automated irrigation system was

developed. The system has a distributed wireless network of soil moisture and temperature sensors placed in the root zone of the plants [1].

Authors Danny Hughes, Gordon Blair and Barry Porter presented a paper on “An Adaptable WSN based Flood Monitoring System”. Flooding is a serious and increasing problem. As a result, there is a need to deploy more sophisticated sensor networks to detect and react to flooding. This paper demonstrates a deployed flood monitoring platform which uses WSN technologies and next generation middleware to improve support for flood warning [2].

Authors T Rajesh, Y Thrinayana and D Srinivasulu presented a paper on “IOT based Smart Agriculture Monitoring System”. In every country from the ages, Agriculture is done. Agriculture is the science and art of cultivating plants. Agriculture is done manually from ages. Agriculture was the key development in the rise of sedentary human civilization. As the world is trending into new technologies and implementations it is a necessary goal to trend up with agriculture also [3].

Authors G Meena Kumari and Dr. V Vidya Devi presented a paper on “Real Time Automation and Monitoring System for Modernized Agriculture”. The technological development in wireless sensor networks made it possible to use in monitoring and control of greenhouse parameter in precision agriculture. Due to uneven natural distribution of rain water, it is very crucial for farmers to monitor and control the equal distribution of water to all crops in the whole farm or as per the requirement of the crop [4].

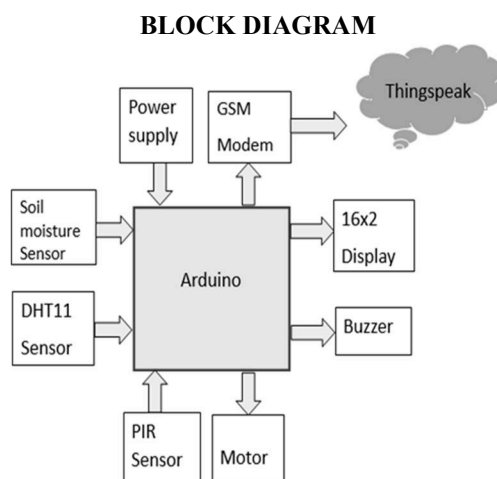


Fig. 1 Block Diagram

The Block diagram of the proposed system is shown in Figure 1. The Block Diagram gives architectural information of the proposed system.

ARDUINO UNO

ARDUINO UNO is a microcontroller board works with ATmega328p micro controller. It also has ATmega16U microcontroller. For Atmega328p, it has high performance Atmel Pico power 8bit AVR RISC based microcontroller which is capable of executing powerful instruction in single clock cycle. The board is equipped with set of 14 digital and 8 analog input output pins. It is interfaced to various expansion boards and other peripherals for different applications. The power supply for the board is given by using mini USB connection of 5V. It is the one of the best AVR controllers and is used in many ARDUINO boards.

GSM

GSM means Global System for Mobile Communications. The operating voltage of GSM SIM800L is 3.4V – 4.4V. GSM is used to send the alert messages and calls to the registered contact numbers. The working of GSM modem is based on AT (Attention) commands, where these AT commands are given to the GSM modem with the help of microcontroller.

SOIL MOISTURE SENSOR

The soil moisture sensor uses capacitance to measure the water content of soil. Simply insert the rugged sensor into the soil to be tested, and the volumetric water content of the soil is reported in percent. It measure the dielectric permittivity of the surrounding medium. The sensor creates a voltages proportional to the dielectric permittivity, and therefore the water content of the soil.



Fig. 2 Soil Moisture Sensor

WORKING

Initially the sensor like DHT 11, PIR sensor, Soil moisture sensor capture the data from the field and it passes to the microcontroller. Now the microcontroller compares the received data with that of pre-existing data and if the values are beyond the threshold point the corresponding devices turn to ON state. Initially temperature inside the farm is compared with that of the pre-defined value in the micro controller and if it is beyond the threshold point then the fan gets ON.

Conclusion and Future Scope

The proposed smart agriculture monitoring is very helpful for the farmers, who are actually in need. Where GSM modem takes the information from the micro controller and forwards the messages to the respective contact numbers. And Wi-Fi model sends the parameters to the IOT server by graphical method. Then farmer performs the necessary precautions to the field.

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