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Automatic Temperature Water Level Controlling for Crop Protection

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ABSTRACT: Agriculture is a backbone of our country. About 70% of our country's revenue comes from agriculture. But during heavy rain falls, the farmers face lot of problems because there cultivated crops get washed off or destroyed. So in order to avoid this problem this project is designed which helps if protecting the crops from heavy rainfall and saving that rain water to use it for other purposes. The saved water can be used for feeding animals, washing, cooking etc. and can also be reused to sprinkle it back to the field when needed. In this system an automatic roof is inculcated which works by taking the signals from the rain and soil moisture sensors and covers the whole field to protect it from heavy rains. Whenever there is rainfall the rain sensor gets activated. The water level in the soil is sensed by the soil moisture sensor. Whenever there is rain, the rain sensor is "ON" and when the water level in the soil is beyond the normal level then soil moisture sensor is "ON". If both the sensors are "ON" then this information is send to the controller. Then the controller indicates the DC motor to run which opens the roof automatically to close the field using a polythene sheet. If there is any problem in opening of the roof, then this is performed manually by the farmers.

KEYWORDS: Agriculture, sensors, farming, motor, polyethylene sheet

I.INTRODUCTION

Plants have had and still have a key role in the history of life on earth. They are responsible for presence of oxygen needed for human survival on this planet. At the same time agriculture is also important to human beings because it forms the basis for food security. It helps human beings grow the most ideal food crops and raise the right animals with accordance to environmental factors. Agriculture plays a vital role in India's economy. Over 58% of the rural households depend on agriculture as their principal means of livelihood. Agricultural export constitutes 10% of the country's exports. So the farmer's and even the nation's economy will be ruined if there are no proper yields due to lack of knowledge of the soil nature, timely unavailability of water. Thus the government should take steps for a better and profitable irrigation. It is a smart farming stick based on IOT (Internet of things) technology which has brought revolution to each and every field of common man's life by making everything smart and intelligent. Aim of this project is to propose a novel smart IOT based agriculture stick assisting farmers in getting live data (Temperature, soil moisture, smoke detection) for efficient environment monitoring which will enable them to do smart farming and increase their overall yield and quality of products. The agriculture stick being proposed via this project is integrated with Arduino technology, breadboard mixed with various sensors and live data feed can be obtained online.

II.LITERATURE REVIEW

Yadnya Adhiya, Shriya Ghuge, H.D Gadade "A SURVEY ON AGRI AUTOMATION SYSTEM USING SENSORS" In Bluetooth based home automation system the home appliances are connected to the Arduino BT board at input output ports using relay. The program of Arduino BT board is based on high level interactive C language of microcontrollers; the connection is made via Bluetooth. The password protection is provided so only authorized user is allowed to access the appliances. The Bluetooth connection is established between Arduino BT board and phone for wireless communication. In this system the python script is used and it can install on any of the Symbian OS environment, it is portable. One circuit is designed and implemented for receiving the feedback from the phone, which indicate the status of the device.



Relevance to current Research

Kim Baraka, Marc Ghobril, Sami Malek, RouwaidaKanj, AymanKayssi “LOW COST ARDUINO/ANDROID-BASED ENERGY-EFFICIENT AUTOMATION SYSTEM WITH SMART TASK SCHEDULING”, To monitor and control the home appliances the system is designed and implemented using Zigbee. The device performance is record and store by network coordinators. For this the Wi-Fi network is used, which uses the four switch port standard wireless ADSL modern router. The network SSID and security Wi-Fi parameter are preconfigured. The message for security purpose first process by the virtual home algorithm and when it is declared safe it is re-encrypted and forward to the real network device of the home. Over Zigbee network, Zigbee controller sent messages to the end. The safety and security of all messages that are received by the virtual home algorithm. To reduce the expense of the system and the intrusiveness of respective installation of the system Zigbee communication is helpful.

Relevance to current Research

HayetLamine and HafedhAbid ” REMOTE CONTROL OF A DOMESTIC EQUIPMENT FROM AN ANDROID APPLICATION BASED ON RASPBERRY PI CARD” Because of the mobile phone and GSM technology, the GSM based home automation is lure to research. The SMS based home automation, GPRS based home automation and dual tone multi frequency (DTMF) based home automation, these options we considered mainly for communication in GSM. In figure shows the logical diagram the work of A. Alheraish, it shows how the home sensors and devices interact with the home network and communicates through GSM and SIM (subscriber identity module). The system use transducer which convert machine function into electrical signals which goes into microcontroller. The sensors of system convert the physical qualities like sound, temperature and humidity into some other quantity like voltage. The microcontroller analysis all signal and convert them into command to understand by GSM module. Select appropriate communication method among SMS, GPRS and DTFC based on the command which received GSM module.

Relevance to current Research

YunCui, MyoungjinKim, YiGu, Jong-jinJung, and HankuLee, 2016 “HOME APPLIANCE MANAGEMENT SYSTEM FOR MONITORING DIGITIZED DEVICES USING CLOUD COMPUTING TECHNOLOGY IN UBIQUITOUS SENSOR NETWORK ENVIRONMENT” Wi-Fi based home automation system using cell phones: Wi-Fi based home automation system mainly consist three modules, the server, the hardware interface module, and the software package. The figure shows the system model layout. Wi-Fi technology is used by server, and hardware Interface module to communicate with each other. The same technology uses to login to the server web based application.

Relevance to current Research

G. Yang, Y. Liu, L. Zhao, S. Cui, Q. Meng, and H. Chen, “AUTOMATIC IRRIGATION SYSTEM BASED ON WIRELESS NETWORK”, 2010. Different problems can occur depending on the location of the station, weather conditions, nearby forest stand or the characteristics of the river. For example rain gauges tend to fill with leaves, tree needles and bird droppings thus distorting the precipitation data. In winter time the turbidity sensors might get broken due to moving ice.

III.METHODOLOGY OF PROPOSED SURVEY

Agriculture plays a significant role in the economic sector. The automation in agriculture is the main concern and the emerging subject across the world. The population is increasing tremendously and with this increase the demand of food and employment is also increasing. The traditional methods which were used by the farmers, were not sufficient enough to fulfill these requirements. Thus, new automated methods were introduced.

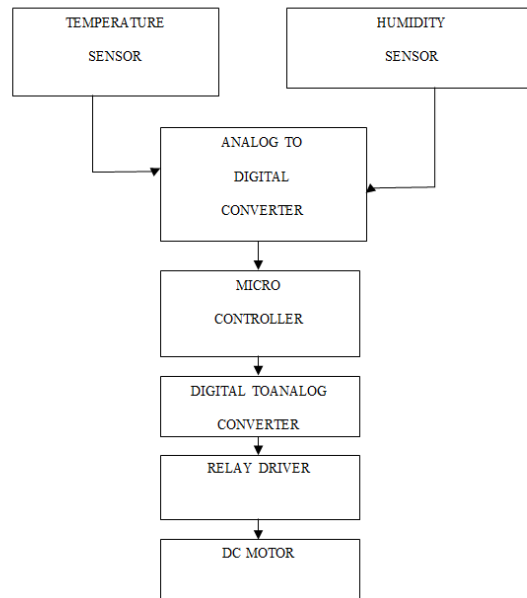


Figure.1 Representation of Working Agricultural Automatic System

Temperature sensor (LM35) is a precision IC temperature sensor with its output proportional to the temperature (in °C). The sensor circuitry is sealed and therefore it is not subjected to oxidation and other processes. With LM35, temperature can be measured more accurately than with a thermistor. It also possess low self heating and does not cause more than 0.1 °C temperature rise in still air. The operating temperature range is from -55°C to 150°C. The output voltage varies by 10mV in response to every °C rise/fall in ambient temperature, i.e., its scale factor is 0.01V/ °C. An automatic irrigation system based on embedded and technology was developed using ATMEL (AT89S52). The developed system incorporates: Sensing devices which sense the dry condition of the defined field or farmland and pass the state to the sensing logic of the automation system, A Control algorithm for water flow regulation. The deficiencies in this irrigation system were: The system lacked the ability to detect soil temperature; the system had no timer mechanism for irrigation scheduling. Designed and developed a mobile irrigation lab for water conservation.

The developed system comprises of Sprinkler irrigation management device and Water management and irrigation scheduling software program. The software program has essential functionalities to perform device calibration, fuel cost evaluation, pumping cost evaluation and also scheduling of pumping. The novelty in their design is the integration of both the hardware and software components. The system lacks detailed notifications based on sensed parameters and actions taken by the system when in action. Used an three 32-bit timers and two 10-bit analog-to-digital converter developed an automatic drip irrigation system. However, the inability of this architecture to determine the exact temperature at which irrigation should commence due to the absence of temperature sensor makes it ineffective as irrigation can commence at any time even when it is sunny (high) which might affect the plant.

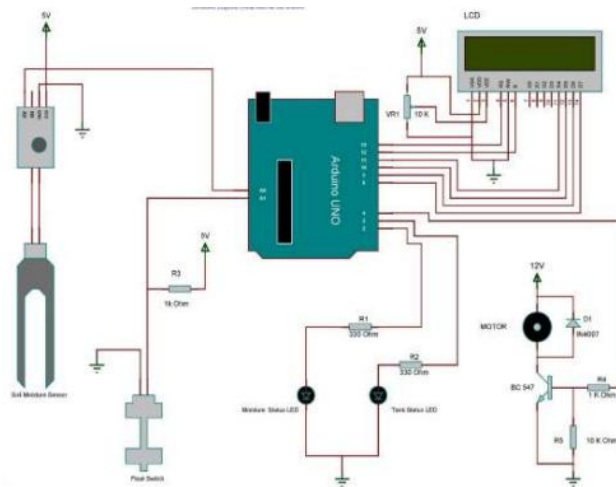


Figure.2 Connection Layouts

IV.RESULT AND DISCUSSION

The user interface helps the user to monitor and control the system effectively. It is made user friendly as it displays various messages to the user displaying the current state of the system. shows the screen-shots of the user interface. The efficiency of the system is also calculated by measuring the level in the tank manually with the help of a measuring tape and is shown in the Table V. The table shows that the control system controls the water level accurately. The error obtained is due to the water in the tubes connected to the pump which rises before the pumps are off but falls into the tank after the pump are turned off by the microcontroller. There are several methods for water level monitoring and control presented in various works but mostly designed so far concentrated on the pump switching based on water level content of the the overhead tank. This work presents a scheme to monitor the the overhead tank water level as well as the underground tank water level simultaneously and then determine the decision of switching the pump on or off. Thus the level of water in both tank together decides in operating the pump helping the entire system to conserve energy, water & also ensure protection of the pump from dry run. The concept can be applied successfully in domestic water level control system with indication of water level along with the prevention of wastage of the most important natural resources ensuring the device protection.



Figure.3 Automatic Motor Control



IV.CONCLUSION AND FUTURE WORK

Any system with cent percent efficiency and zero error are almost impossible. An electronic project using these many chips and sophisticated sensors cannot be expected to perform with the accuracy we expect in ideal case. So the limitations are obvious but finding them and presenting them for future enhancement is the most important part. Working with various communication standards and depending upon any other system for the output of the system makes the system even more error prone. Some of the limitations are stated as below:

The sensor may detect motion where detection is not desirable and not detect motion where it is desirable. As the sensor is extremely sensitive to motion, even object blowing in wind & florescent lighting may cause triggering. Sensor detects both the forward & lateral motion. But our objective to detect only forward motion not is worked on the backward of machine or lateral motion.It doesn't provide security. It is useful for public sector rather than private sector. It is operated by electrical energy. It cannot be functioned in absence of electrical power. It also cannot be opened or closed manually. Frictional effect is considerable in the movement of door operated by pulley drive.

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