

Water Tracking System in Agriculture Field

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Abstract : Indian agriculture is diverse ranging from impoverished farm villages to developed farms utilizing agricultural technologies. Promoting application of modern information technology in agriculture will solve a series of problems facing by farmers. Lack of exact information and communication leads to the loss in production. Our project is designed to overcome these problems. This system provides an intelligent monitoring platform framework and system structure for facility agriculture ecosystem based on IOT. Propose the IOT based smart agriculture model main aim to avoid water wastage in the irrigation process. The project aims at making use of evolving technology i.e. smart agriculture using automation. Monitoring environmental conditions is the major factor to improve yield of the efficient crops.

Keywords: Embedded system, Water motor, LCD display, Arduino IDE code, Bridge rectifier.

I. INTRODUCTION

As the world is trending into new technologies and implementations it is a necessary goal to trend up in agriculture also. Many researches are done in the field of agriculture. Most projects signify the use of wireless sensor network collect data from different sensors deployed at various nodes and send it through the wireless protocol. The collected data provide the information about the various environmental factors. Monitoring the environmental factors is not the complete solution to increase the yield of crops. There are number of other factors that decrease the productivity to a greater extent. Hence automation must be implemented in agriculture to overcome these problems.

II. LITERATURE SURVEY

Sinung Suakanto, Ventje J. L. Engel, Maclaurin Hutagalung, agricultural sector has been facing great challenges in order to feed the increasing number of population living in the world. In the future, it will be very difficult to rely on traditional farming to produce, food. Some researchers and industry experts information technology. This paper presents the Chetan Dwarkani M, Ganesh Ram economic sector and plays an important role in the overall economic development of a nation. Technological advancement sin the arena of agriculture will ascertain to increase the competence of certain farming activities. In this paper, we have proposed a novel methodology for smart farming by linking a smart sensing system and smart irrigator system through wireless communication technology. Oursystem focuses onthe measurement of physical parameters such as soil moisture content, nutrient content, and pH of the soil that plays a vital role in farming activities.

III. EXISTING SYSTEM

In existing system Zigbee network has implemented for transferring the measured parameters. This system installed with sensors which measure the parameters of agriculture field and transfer the measured details using Zigbee. A Zigbee based smart agriculture system was proposed for doing automation of several agriculture tasks. Automation is proposed by smart irrigator that moves on mechanical bridge slider arrangement. The smart irrigator receives signal from smart farm sensing system through zigbee module. The sensed data is transferred towards central database from which all crop details are analyzed and transferred to irrigator system to perform automatic actions.

IV. PROPOSED SYSTEM :

Proposes the automatic irrigation system using Arduino for smart crop field productivity. This system consists of sensor like moisture sensor. Moisture sensor used for detecting the moisture content in soil. If the moisture level or temperature level is detected; if it is high level, then motor will ON. The measured parameters are uploaded to IOT through this farmer can monitor anywhere. Based on the command from IOT water motor will ON. The measured parameters are displays on LCD. Hence, consumers are being the flow sensor detected the water leakages and updated the IOT Server Also. The construction of a smart farming systems using sensors and a microprocessor as part of a system is discussed. The goal of the implementation is to exhibit the microcontroller's clever and intelligent capabilities by allowing decisions on watering the plants to be made based on constant monitoring of the field's environmental conditions.

V. PROTEUS

ISIS has wide range of components in its library. It has sources, signal generators, measurement and analysis tools like oscilloscope, voltmeter, ammeter etc., Probes for real time monitoring of the parameters of the circuit, switches, displays, loads like motors and lamps, discrete components like resistors, capacitors, inductors, transformers, digital and analog Integrated circuits, semi-conductor switches, relays, microcontrollers, processors, sensors etc. ARES offers PCB designing up to 14 inner layers, with surface mount and through whole packages. It is embedded with the foot prints of different category of components like ICs, transistors, headers, connectors and other discrete components. It offers Auto routing and manual routing options to the PCB Designer. The schematic drawn in the ISIS can be directly transferred ARES.

VI. STEPDOWN TRANSFORMER

Our project consists of Step down transformer it will change the incoming 230 volts into 12 volts AC. To convert AC into DC we will use rectifier, other devices needs more volts to run so it stores the volts into many parts it looks like junction box. In our project we use ATMEGA 328P micro controller it consists of 3 parts namely power, analog, digital there are 28 IC pins in that. We use LCD display it has 2 lines upper line has 16 CAT and lower line has 16 CAT.

If there is any possible of leakage it indicates on LCD display by using this we can come to know and it helps to stop the leakage. If there is no water supply it shows as no water on the LCD display. We have moisture sensor too if we dip that sensor in water or soil content it will show as high on LCD display. We use IOT module to upload output on internet. The main component we are using is water motor without this the motor cannot run if the water is leaked we can off the motor by using the IOT module. We use two flow sensor namely flow sensor 1 and flow sensor 2.

PRODUCT MODULE

The Proteus Design Suite is a Windows application for schematic capture, simulation, and PCB (Printed Circuit Board) layout design. It can be purchased in many configurations, depending on the size of designs being produced and the requirements for microcontroller simulation. All PCB Design products include an auto-router and basic mixed mode SPICE simulation capabilities.

SCHEMATIC CAPTURE

Schematic capture in the Proteus Design Suite is used for both the simulation of designs and as the design phase of a PCB layout project. It is therefore a core component and is included with all product configurations

MICROCONTROLLER SIMULATION

The micro-controller simulation in Proteus works by applying either a hex file or a debug file to the microcontroller part on the schematic. It is then co-simulated along with any analog and digital electronics connected to it. This enables its use in a broad spectrum of project prototyping in areas such as motor control, temperature control and user interface design.

MOISTURE SENSOR

The Moisture sensor is used to measure the water content (moisture) of soil. When the soil is having water shortage, the module output is at high level; else the output is at low level. This sensor reminds the user to water their plants and also monitors the moisture content of soil. It has been widely used in agriculture, land irrigation and botanical gardening.

WORKING PRINCIPLE

The Soil Moisture Sensor uses capacitance to measure dielectric permittivity of the surrounding medium. In soil, dielectric permittivity is a function of the water content. The sensor creates a voltage proportional to the dielectric permittivity, and therefore the water content of the soil.

LIQUID CRYSTAL DISPLAY

A liquid crystal display (LCD) is a flat panel display, electronic visual display, or video display that uses the light modulating properties of liquid crystals. Liquid crystals do not emit light directly. LCDs are available to display arbitrary images (as in a general-purpose computer display) or fixed images which can be displayed or hidden, such as preset words, digits, and 7-segment displays as in a digital clock.

They use the same basic technology, except that arbitrary images are made up of a large number of small pixels, while other displays have larger elements. An LCD is a small low cost display. It is easy to interface with a microcontroller because of an embedded controller (the black blob on the back of the board). This controller is standard across many displays (HD 44780) which means many micro-controllers (including the Arduino) have libraries that make displaying messages as easy as a single line of code.

WATER MOTOR

A pump motor is a DC motor device that moves fluids. A DC motor converts direct current electrical power into mechanical power. DC or direct current motor works on the principle, when a current carrying conductor is placed in a magnetic field, it experiences a torque and has a tendency to move. This is known as motoring action. Pumps operate by some mechanism (typically reciprocating or rotary), and consume energy to perform mechanical work by moving the fluid. Pumps operate via many energy sources, including manual operation, electricity, engines, or wind power, come in many sizes, from microscopic for use in medical applications to large.

NODEMCU

NodeMCU is a LUA based interactive firmware for Espressif ESP8262 Wi-Fi SoC, as well as an open source hardware board that contrary to the \$3 ESP8266 Wi-Fi modules includes a CP2102 TTL to USB chip for programming and debugging, is breadboard-friendly, and can simply be powered via its micro USB port.

NodeMCU is a WiFi SOC (system on a chip) produced by Espressif Systems. It is based ESP8266 - 12E WiFi module. It is an highly integrated chip designed to provide full internet connectivity in a small package. It can be programmed directly through USB port using LUA programming or Arduino IDE. By simple programming we can establish a WiFi connection and define input/output pins according to your needs exactly like Arduino, turning into a web server and a lot more. NodeMCU is the WiFi equivalent of ethernet module. It combines the features of WiFi access point and station + microcontroller. These features make the NodeMCU extremely powerful tool for WiFi networking. It can be used as access point and/or station, host a web server or connect to internet to fetch or upload data.

VII. CONCLUSION

IOT based smart agriculture system can prove to be very helpful for farmers since over as well as less irrigation is not good for agriculture. Threshold values for climatic conditions like humidity, temperature, moisture can be fixed based on the environmental conditions of that particular region. The system also senses the invasion of animals which is a primary reason for reduction in crops. This system generates irrigation schedule based on the sensed real time data from field and data from the weather repository. This technology can tell a farmer about the irrigation necessity. Water Leakages will lead numeral of customer's complaint and will reflect negative perspective of water operator operational efficiency in agriculture field.

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