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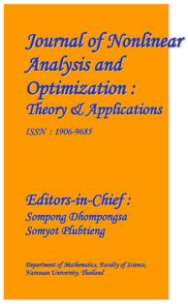

DESIGN AND SYNTHESIS OF SOIL MOISTURE MONITORING SYSTEM USING ARDUINO

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Abstract.
With respect to professionalism and the demanded resources, the agricultural field is high in demand always. Now a day's majority of the nations depend on the agricultural economy growth, consumption of food, employment and trade. So there are many challenges rise for the agriculturalists. So various agriculturalists, scientists, farmers around the world believe to formulate these methods and plans and ideas to deal with challenges. Anyways this project Is mainly describing the use of embedded systems in the field of agriculture. Especially monitoring the crops. The resources are in crisis in somehow. So this projects is intends to use these limited resources in efficient manner so that the cost may reduced. Apparently it is very much important to utilize the resources in a proper way. Lay of land, whether and insects, water availability etc are factors which affecting the crops mainly.
. The proposed model consists of a micro controller, sensors like soil moisture sensor, gate walls (i.e. DC motor) and a water pump represents by the water pump. The sensors senses all the parameters and moderated by the micro controller, and send the information to the micro controller. Based up on the receiving information the micro controller di the necessary action such as turning on the water pump using the appropriate application. So the Farmers can save their time which they used it for irrigation.

1. INTRODUCTION

In this work, the micro controller consists a embedded system along with centre point sensors in yield field. Agricul- ture which is considered as one of the prime occupation of human being. In this system, all the devices work on their own with the help of the inputs received from the sensors [1-3]. The sensors which are placed in the field provide us with the data in regard to the field which is then controlled and monitored by collects the information such as temperature, soil moisture content and detection of rain which affects the growth of crops and soil formation through the sensors installed outside [5]. One of the major factors aims at controlling the unwanted usage of water. Most of the system aims keeping in view the educational and financial background of the average Indian farmers. Both greenhouses based as well an open field can be considered for monitoring the field [6]. One of the important factors to keep in mind is maintaining the humidity and temperature which are greatly influenced by the outside atmosphere. For real time monitoring and controlling the green house equipped with extra sensors and actuators compulsorily.

2. MATERIALS AND METHODS \\

Materials
For this we use Arduino-Uno Microcontroller, Soil Moisture Sensor, Solar Panel, DC Motor, battery, Relay switch, voltage regulator, connecting wires and bread board.

Methods

For this project we have used the software Arduino-IDE compiler for compilation part. Sketchbook is the concept used by the Arduino Software (IDE) :To store your programs (or sketches) , it uses this particular area. The sketches in your sketchbook can be opened from the File > Sketchbook menu or from the Open button on the toolbar. The Arduino software create a directory for your sketchbook when we use it for the first time run on the tool bar.

3. FLOW CHART

The below schematic explain the flow chart of design. The Arduino software create a directory for your sketchbook

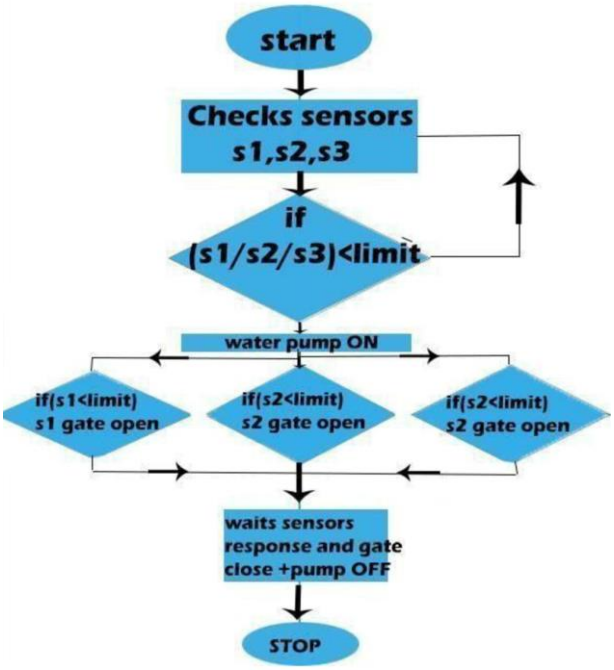

FIGURE 1. Flow Chart

when we use t for the first time run.

Once the pump is switched on, it checks which part of the field is dry and the corresponding parts gate is opened to let the water in. The gate is opened till the whole part gets water. When the sensor shows wet status in that part, the gate is closed and the pump is switched OFF.If more than one part is dry, the corresponding gates gets opened and supply water to those parts till they get water.

This process continues till the harvesting time and will stop only if the system is turned OFF manually.

4..SCHEMATIC DIAGRAM

The below picture depicts the schematic design of the prototype. The above diagram show the arrangement of the

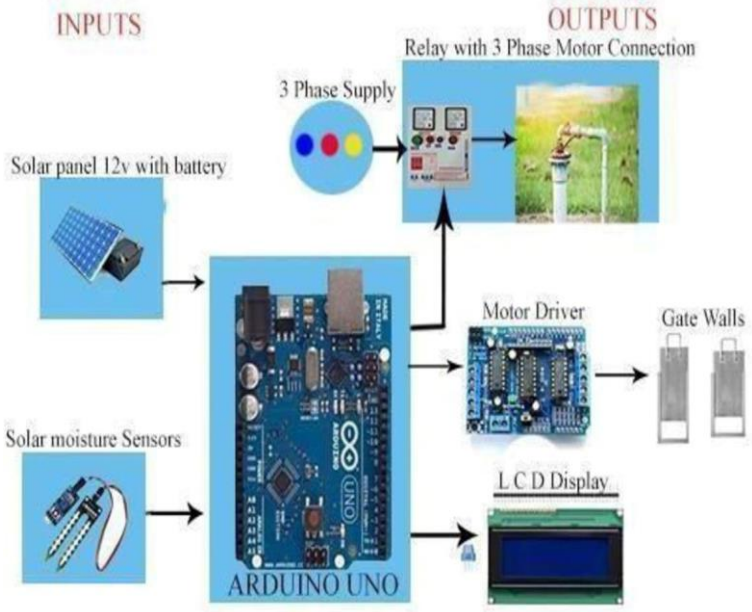

FIGURE 2. Schematic Diagram

circuit with its device, input devices ,output devices, Input power and the power source and the information indica- tors(LCD) and micro controller which process signals from inputs and send signals to output devices.

5. RESULTS

In this model, when the components are activated the sensors will read and gives the input to the micro controller. Then the controller accesses the information and processes it, if the moisture is the below the threshold value the controller value switches ON the pump. Once the pump is switched on, it checks which part of the field is dry and the corresponding parts gate is opened to let the water in. The gate is opened till the whole part gets water. When the sensor shows wet status in that part, the gate is closed and the pump is switched OFF. If more than one part is dry, the corresponding gates gets opened and supply water to those parts till they get water. This process continues till the harvesting time and will stop only if the system is turned OFF manually.

When the system is turned ON the sensors checks for the status, give the report to controller. The controller displays the result on the display and send signal to the respective gate to open or close based on the message received from

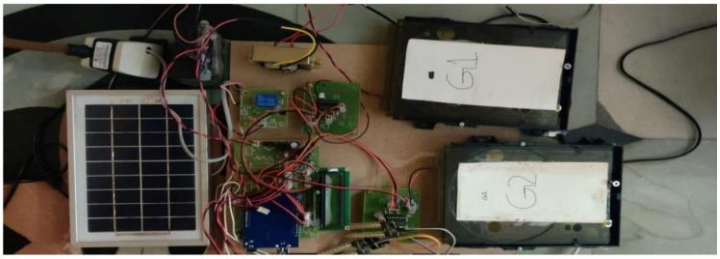

FIGURE 3. Ideal condition of the design

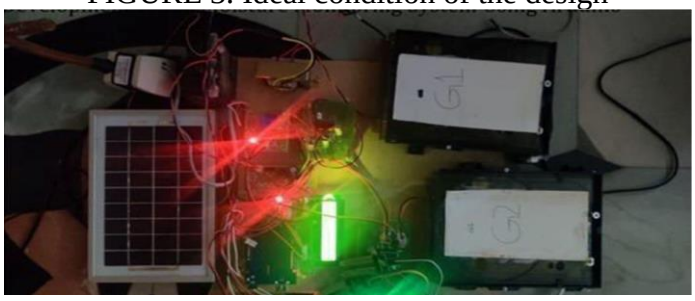

FIGURE 4. Working condition of the Design

the sensor , simultaneously the water pump is Switched ON or OFF. The controller continuously checks the status of the sensors and sends the appropriate signal to respective device.

CONCLUSION AND FUTURE SCOPE

For the small sized fields, the above design gives the smart crop monitoring system. The crop field is partitioned into several sub section fields , so that each and every sub section consists of such model. Depending on the size of the field, the sensors are been varied. To use the embedded system for such applications, we need to face plenty of issues and challenges. Rigorous research and exploration in different ways may help us to tackle with these challenges and problems faced and may improve the working of such models.

Currently the project sticks only to one type of crops (i.e crops like maize,cotton project can be extended in such a manner that it can be useful for other type of crops like wheat ,vegetables which requires water frequently. An extra micro controller can also be engaged to collect information from different micro controllers, working for different crops and sends information to the farmer when he asks to send the report. The project can also be implemented using IOT for precise control of irrigation by farmers. In this section we welcome you to include a summary of the end results of your research.

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