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SMART IRRIGATION SYSTEM USING AURDINO

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Abstract

Modern technologies have been embraced across the board even in the field of agriculture. Automation is the technology by which the procedure or process is performed by machines or electronic devices with no human intervention. The main target of this paper is to show how a person could construct the automatic irrigation system of his own not very expensive facilities by devoting a couple of hours to joining some electronic parts and other materials.

An automatic irrigation system based on sensor and computer technologies has been designed and applied in practice as one of the most frequently and efficiently functioning automated systems. This system is operated with sensor, microcontroller, relay, dc motor and battery. This system acts as an intelligent operating switching system which identifies the moisture content of the soil and automatically waters the plant where necessary.

The ON/OFF motor control will be actuated automatically according to the value of the soil dryness level. The sensor measurements are transferred to the computer for the generation of graphs and their interpretation.

1.INTRODUCTION

In the world 85% of water is using for agriculture and it will not get decrease asthe rate of population increasing day by day and the demand of food products is increasing. So it is the time to introduce the modern technology in to the field for improving the production of food and to help the farmers for to complete work faster and easier.

SmartirrigationsystemusingArduinois theoneofthegoingtechnologywhichwe should use in the modern agriculture. This will help the farmers in the part of watering the crop according to the situation of the soil and according to the weather conditions.

As we are using the Arduino sensor in this system we will get the moisture level in the soil and according to the level the total irrigation system will work. If the crop need watering then the system gets into it work and the motor will switch on and when the work is done it will

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turn off automatic.

2.LITERATURESURVEY

Currently, farmers are employing the use of electric motors in their irrigation activities. Now since they are using either a three horse power motor or a five horsepowermotor,thenthetimewhich was estimatedtohavewaterinthewells gets utilized and the crop will never fully be ready watered. According to the survey majority of the crops are not fully sown due to the water deficit and this will have quite a negative effect on the food supply.

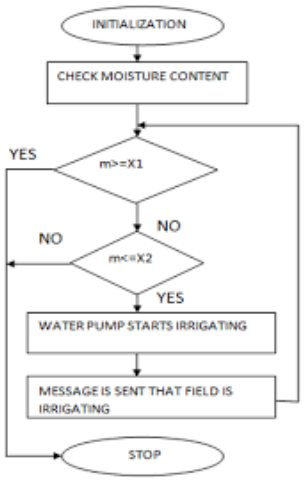
In order to address this issue, we are planning to integrate today's practices with the agricultural sector. We aim to employArduino sensor withmoisture detection sensor in watering the vegetation. Hyacinth will assist us in finishing the cropping cycle. This system will assist agriculturalists in obtaining the much needed yields.

SoilmoisturesensorandthewaterlevelsensorareinterfacedtotheArduinoUNO board using jumper wires and a breadboard and only the connections are provided in this section. As for the dampness of the soil, it is the Soil moisture sensor which will sense its occurrence and through WSN the data

3. METHODOLOGY

Eventually, actuators will be used to carry out the required action with the data.A threshold value which is upper and lower has been established as such whenever the obtained reading goes beyond the threshold, the motor will be turned on or off automatically. There is same working with water level sensor in which a minimum and maximum threshold value has been established so whenever the measured value of water level goes beyond the maximumthreshold water will have to fill tank and vice versa.

In order to show thelevels of moisture content of soil and water levelsof tank, an LCD which is interfaced with Arduino and all the gauges was used. A 5V motor pump hasbeen utilizedforthis projectbecausethis is aminiprototypemodeland Arduino which has been used in this project can provide maximum of 5 volts power.



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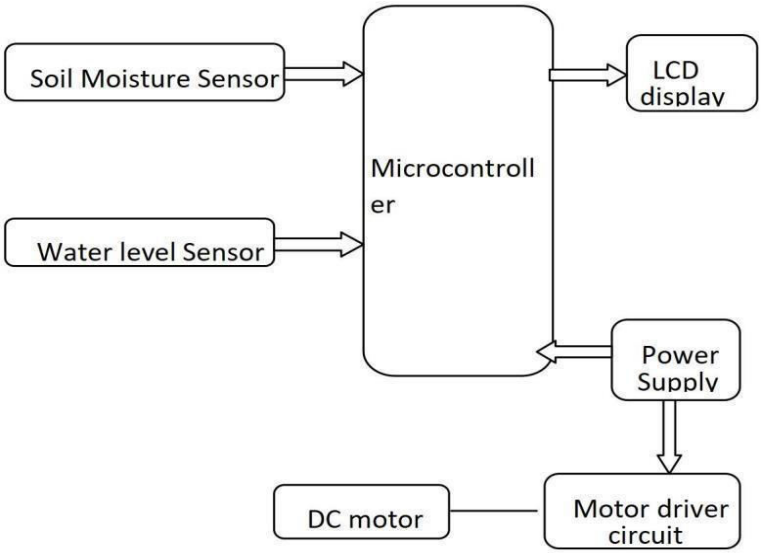
4. IMPLEMENTATION

C language with some extra keywords known as arduino language is used to program microcontrollers using the GUI which is the arduino IDE. Programming has two essential functions, namely: setup() and loop(). The setup function pertains to the initial value of the variables whilst loop function pertains to the operational functions whereby the loop runs nonstop until the power is switched off.



ALGORITHMS

1.Algorithm forworking of the project

Begin

Initializethresholdforwaterlevelintankandthresholdformaximumdrynessin soil variables definition setup() set input pin and output pin end of function loop() sensorvalue<--------- pinreading

If sensorvalue>=maximumdryness then print "soil dry start watering" output pin> HIGH Else

print"soiliswet"outputpin ---------->

LOWEndifprintresultson

serial monitor output value□ water level reading

If output value <= water level thresholdthen print "tank is empty" output pin for alarm>HIGH Else print "tank is full" output pin for alarm> LOW

endof function

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convert()convertsensorvaluetopercentageprint percent value
endoffunction End

2.Componentsconnectiondescription

Table1:Connectingsoilmoisturesensor

Arduino UNO board	**Soil moisture sensor**
5V	VCCpin
GND	GND
A0	A0

Table2:ConnectingLCDdisplay

Arduinoboard	**LCDdisplay**
Digitalpin12	RST
Digitalpin11	CE
Digitalpin10	DC
Digitalpin9	DIN
Digitalpin8	CLK
3.3V	VCC
GND	LIGHT
GND	GND

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Table3: Connectingwaterlevelsensor

ArduinoUNOboard	**Waterlevelsensor**
GND	negative
5V	positive
Analog pin	S

Table4: Connectingwatermotorpump

Arduino UNO board	**Water motor pump**
Digitalpin	Wire1
GND	Wire2

5. PROPOSEDSYSTEM

The proposed irrigation system for agrarian purpose can measure the Soil humidity, temperature of the field and transmits the real time data to the stonerthroughtheWi-FiandIOTgarçon,ifthere'sanydivagation fromthe span of reference value,also thestoner canshoot the command through the IOT garçon to maintain.

1. Blockillustrationofproposedirrigationsystem

TheblockillustrationoftheproposedirrigationsystemisshowninFigure-

1. The main advantage of the proposed irrigation system is that it canshoot the information of a soil to thestoner through IOT network for irrigation. Powerforce is given to the circuit in the form of voltage or current. Then soilhumiditydetector measuresthe water content of soiland its affair is fed to the amplifier, which is used to ameliorate the gain value. And this measured value is given to the Arduino UNO as analog input. And second input of the Arduino comes from LDR and ray. These two analog inputs are converted to digital affair values by Arduino UNO.

2. dimensionofsoilhumidityinProposedIrrigationSystem

The is designed to measure the soilhumidity content in the field so that it gives the accurate

value of soilhumidity content in terms voltage. It contains two electrodes and averitably littlevolume of cataplasmdyads. The gypsum material is used that shows water absorbing property, depending on the water content in the soil the absorbing rate varies. The conduction through electrode varies with content of water absorbed by gypsum and also there's a change in resistance of a captain depends upon thehumidity content. In wet condition of field, its resistance become100K hence the drop at the flipping outstation islower than at the flipping terminal. Hence the affair from comparator is Vs indicating normal wet condition. This affair is fedto the PLC, it'll not bespark the relay. When the dry condition is appeared in the field, its resistance value is 10K and therefore the drop at thenon-inverting terminal than that at the flipping terminal. Hence the affair from this V sat indicating adefective condition. This affair is fed to the PLC. It'll becrankingthe relay.

An automated irrigation system is developed which is effective enough to optimize application of water and othercoffers. This system helps in irrigation in areas with low waterposition and leads to sustainability. This system isveritably unpredictable and lowconservation and could be acclimated according tocolorful types of crops withoutimportantmortalsweats. Different modules in terms ofmileage ofdesign that's green house or open field can be developed andenforced usinganalogousways. Other than cost reduction thisdesign helps tosavethevitalelementoflifethat'swater.Infuturethisdesigncanbeextended to biggerposition ofhusbandry as thisdesign is only limited tohusbandry at home. GSM/ GPRS module can be extended in thisdesign toshoottextbook dispatches to theproprietor of itstheaterabout water motor pump status.

6. CONCLUSION

Smartirrigation systems insurethattheshopsgathermaximumreliable hydration with the resource of covering soilhumidity degrees and conforming irrigation schedules consequently. Thisperfection permits maintaining healthy root systems and promotes lively growth ofshops. Smartirrigation systemspoweredbyIOTtechnologyarevitalin husbandry. Traditionalstylesfrequentlyharmfactoryhealthandwastewater.Again, IOT- driven smart irrigation enhances wateroperation, boosts crop yield, and supports sustainablehusbandry.

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REFERENCES

Ning Wanga, Naiqian Zhangb, Maohua Wangc," Wireless detectors in husbandry and food assiduity — Recent development and unborn perspective", wisdom direct, 2006.

Raul Morris, A. Valente, and C. Sergio," A Wireless Sensor Network for Smart Irrigation and Environmental Monitoring A Position Composition", EVITA, 2005.

Y Kim's, R. G Evans," Software design for wireless detector grounded site specific irrigation", Elsevier, 2009.

Dan Teibel Pat Bowen," Results from an Agrarian Wireless Sensor Network", IEEE, 2004.
Yunseop(James) Kim, Member, IEEE, Robert G. Evans, and William M. Iversen," Remote Sensing and Control of an Irrigation System Using a Distributed Wireless Sensor Network", IEEE, 2008.

Adeel- your- Rehman, and Zubair A. Shaikh," Towards Design of Context Aware Sensor Grid Framework for Agriculture", 2008.

Qiang Fu, Zhenxiang Xing, Yongsheng Ma," Applying Multivariate Auto RetrogressionModeltoForecasttheWaterdemandofWellIrrigationRicein Nanjing Plain", 2004

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BIBLIOGRAPHY

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