

# Secure Farming System Using IOT

Dayana Rose S<sup>1</sup>, MR. Ajin<sup>2</sup>, Dr. Ferlin Deva Shahila<sup>3</sup>

<sup>1</sup>M.E (Applied Electronics), Department of ECE, LITES, Thovalai, Tamil Nadu, India

<sup>2</sup>Department of ECE, LITES, Thovalai, Tamil Nadu, India

<sup>3</sup>Ph.D. Head of the Department, Department of ECE, LITES, Thovalai, Tamil Nadu, India

## ABSTRACT

Smart Husbandry is an arising conception, because IOT detectors are able of furnishing information about husbandry fields and also act upon grounded on the stoner input. The point of this paper includes development of a system which can cover position of water, humidity and indeed the color change in crops if any happens in the field which may destroy the crops in agrarian field through detectors and the pump motor is used to pump the water from the tank when the field is dry using Arduino UNO board. The design aims at making use of evolving technology i.e. IOT and smart husbandry using robotization. Once tackle has been developed depending on the change in conditions and technology the software needs the updating. The streamlined tackle is called new interpretation of the software. This new interpretation is needed to be tested in order to insure changes that are made in the old interpretation work rightly and it'll not bring bugs in other part of the software. This is necessary because streamlining in one part of the tackle may bring some undesirable goods in other part of the tackle.

**Keywords :** Humidity, Color change, Pumb motor, Arduino UNO

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## I. INTRODUCTION

The Agriculture Parameters are exercising an IOT Technology and system vacuity that draw in these objects to assemble and deal information." The IOT enables effects named honored or potentially forced ever cornerwise over completed the process of being configuration, manufacture open gateways for all the fresh egreious merge of the substantial earth into PC grounded fabrics, in addition to admitting caught capacity, perfection and cash connected favored station. Precisely when IOT is extended with detectors and selectors, the enhancement modify into an

occasion of the all the redundant wide order of electronic physical structures, which in like manner in commercial marches, for case, clever grids, splendid homes, canny moving and smart civic groups. All is especially specific through its introduced figuring configuration anyway can interoperate within the current Internet establishment.

## II. LITERATURE SURVEY

1. IoT based Smart Agriculture was presented by Nikesh Gondchawar, Prof. Dr. R. S. Kawitkar

IOT use growers to get related with his hearthstone from wherever and at whatever point. Remote detector structures are employed for watching the grange conditions and bitty scale regulators are employed to control and denuclearize the home shapes. To see ever the conditions as picture and videotape, remote cameras have been used. IOT development can dwindle the cost and modernize the productivity of standard developing.

2. Wireless Sensor Network in Precision Agriculture Application was presented by Mohamed Rawidean, Mohd Kassim,

An algorithm was developed with threshold values of temperature and soil humidity( Rawls and Turq formulas) that was programmed into a microcontroller- grounded gateway to control water volume. In this paper, we apply a platform for perfection husbandry which allows to collect abecedarian physical marvels needed for the perfection husbandry, which will be treated to calculate the need for water demanded for optimal irrigation.

3. IoT based smart security and monitoring devices for agriculture was presented by R. Balaji, N. Prakash

This device can be controlled and covered from remote position and it can be enforced in agrarian fields, grain stores and cold stores for security purpose. This paper is acquainted to accentuate the styles to break similar problems like identification of rodents, pitfalls to crops and delivering real time announcement grounded on information analysis and processing without mortal intervention.

### III. EXISTING SYSTEM

The soil humidity grounded irrigation control uses Tensiometric and Volumetric ways, which are fairly simple but these amounts are related through a soil water characteristic wind that's specific to a soil type. Also the detectors use bear routine conservation for proper performance. Intelligent automatic factory irrigation system concentrates soddening shops regularly without mortal monitoring using a humidity

detector. The circuit is make around a comparator Op-amp( LM324) and a timekeeper which drives a relay to switch on a motor. The system uses a tackle element, which is subordinated to variation with the environmental conditions. A real- time wireless smart detector array for scheduling irrigation prototyped a real- time, smart detector array for measuring soil humidity and soil temperature that uses off- theshelf factors was developed and estimated for scheduling irrigation in cotton. This system is specific for a crop and hence its operation is limited. Proper scheduling of irrigation is critical for effective water operation in crop product, particularly under conditions of water failure. The goods of the applied quantum of irrigation water, irrigation frequence and water use are particularly important. To ameliorate water effectiveness there must be a proper irrigation scheduling strategy. In this paper a simple system is mentioned using a microcontroller to automate the irrigation and watering of small potted shops or crops with minimum homemade interventions. If it's a homemade mode also regulator keep checking for the incoming communication and if it gets a new communication also regulator reads the content of the communication and if it contains ON also it makes the separate Relay ON by transferring the high signal to the motorist.

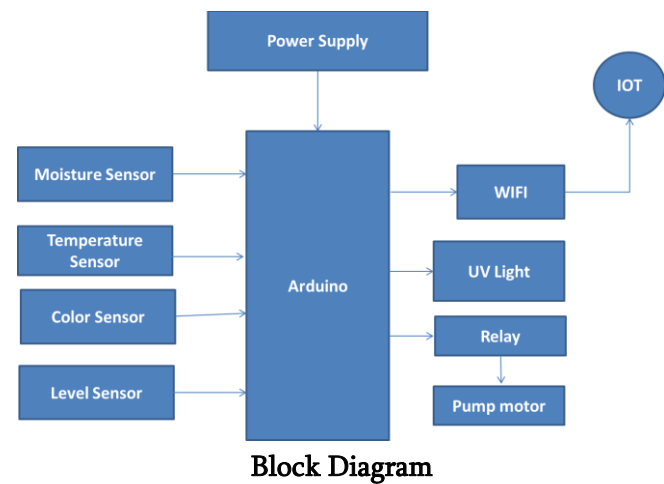
### DISADVANTAGES

- Many of the GSM technologies are patented by Qualcomm
- In order to increase the coverage repeaters are required to be installed.
- GSM provides limited data rate capability, for higher data rate GSM advanced version devices are used.

### IV. PROPOSED SYSTEM

The design uses a Wi- Fi module( ESP8266- 12) which connects the system to internet. This module controls a motor for supplying water to the field on the

information attained from a moisture index and soil humidity detectors. A new color detector for agrarian monitoring. The detector communicates ever with a anthology using backscatter bistatic norms. This whole system is covered and controlled by android App through internet. The design also depicts the conception of Internet of effects( IoT).

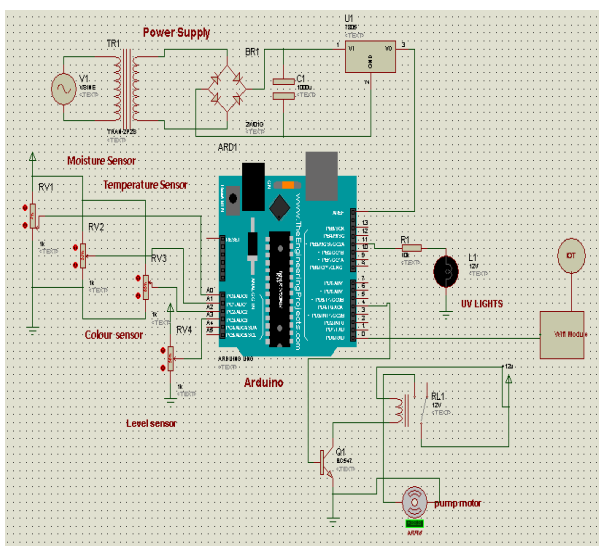


**Block Diagram**

**ADVANTAGES**

- water levels based on things such as soil moisture and weather predictions.
- Local and commercial farmers can monitor multiple fields in multiple locations
- Real-time insight and process automation through low cost sensors and IoT platform implementation

**CIRCUIT DIAGRAM**

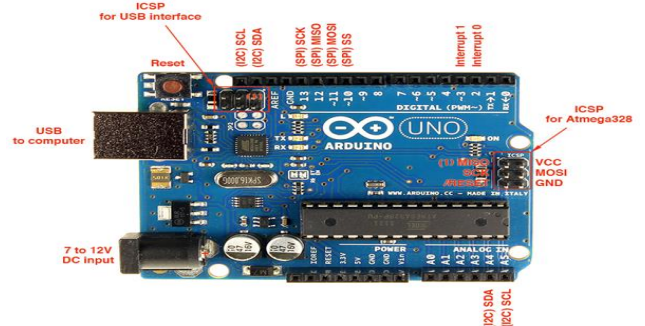


**HARDWARE DESCRIPTION**

- Arduino Controller
- Power Supply
- Moisture Sensor
- Temperature Sensor
- Colour Sensor
- Wifi
- Uv Light
- Water level sensor
- Relay
- Pump motor

**ARDUINO CONTROLLER**

The Arduino Uno is one of the most common and extensively used Arduino processor boards. There are a wide variety of securities( draw in boards adding functionality). It's fairly affordable( about\$ 25-\$ 35). The rearmost interpretation as of this jotting(3/2014) is modification 3( r3). modification 2 added a pull-down resistor to the 8U2 HWB line, making it easier to put into DFU( Device Firmware Update) mode. modification 3 added o SDA and SCL legs are now brought out to the title near the AREF leg( upper left on picture). SDA and SCL are for the I2C interface o IOREF pin( middle lower on picture that allows securities to acclimatize to the voltage handed. Another leg not connected reserved for unborn use. The board can be powered from the USB connector.

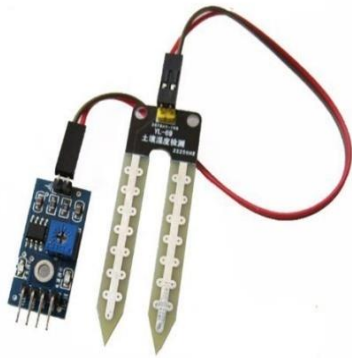


**Pin diagram of Arduino Controller**

**MOISTURE SENSOR**

This humidity detector can read the quantum of humidity present in the soil girding it. This detector

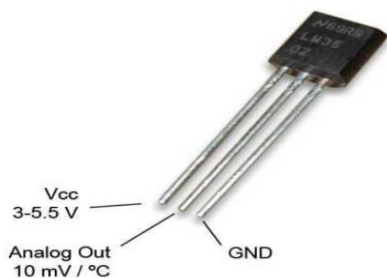
uses the two examinations to pass current through the soil, and also it reads that resistance to get the humidity position. further water makes the soil conduct electricity more fluently( lower resistance), while dry soil conducts electricity inadequately( more resistance). It'll be helpful to remind you to water your inner shops or to cover the soil humidity in your theater .



**Soil Moisture Sensor**

**TEMPERATURE SENSOR**

A temperature detector is a device, generally, a thermocouple or RTD that provides for temperature dimension through an electrical signal. A thermocouple( T/ C) is made from two different essence that induce electrical voltage in direct proportion to changes in temperature.



**Temperature sensor**

**COLOR SENSOR**

In the TCS3200, the light- to- frequency motor reads an 8 x 8 array of photodiodes. Sixteen photodiodes have blue pollutants, 16 photodiodes have green pollutants, 16 photodiodes have red pollutants, and 16 photodiodes are clear with no pollutants. In the TCS3210, the light- to- frequency motor reads a 4 x 6 array of photodiodes. Six photodiodes have blue

pollutants, 6 photodiodes have green pollutants, 6 photodiodes have red pollutants, and 6 photodiodes are clear with no pollutants.



**TCS3200 Colorsensor**

**UV LIGHT**

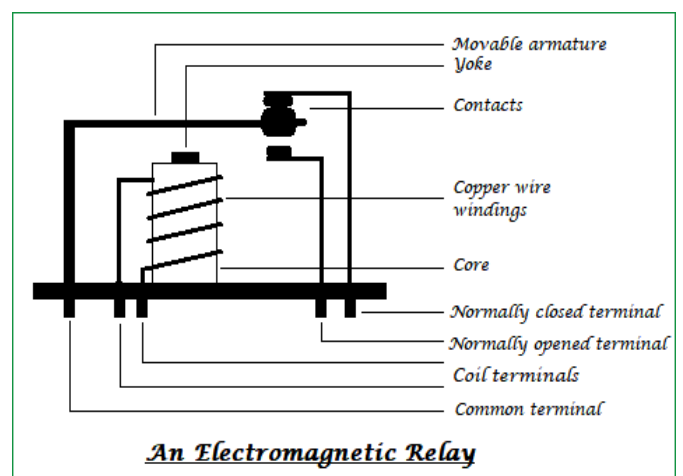
Ultraviolet( UV) is electromagnetic radiation with wavelength from 10 nm( with a corresponding frequency of roughly 30 PHz) to 400 nm( 750 THz), shorter than that of visible light but longer than X-rays.

**WIFI Module**

The ESP8266 WiFi Module is a tone contained SOC with integrated TCP/ IP protocol mound that can give any microcontroller access to your WiFi network

**RELAY**

The main operation of the Relay was seen in the history for transmitting and entering the information, that was called as Morse law where the input signals used to be moreover 1 or 0, these change in signals were mechanically noted in terms of ON and OFF of a light bulb or a beep sound



**An Electromagnetic Relay**

**Electromagnetic Relay**

## PUMP MOTOR

The whole assembly is submerged in the fluid to be pumped. The main advantage of this type of pump is that it prevents pump cavitations. Small DC Submersible water pumps push fluid to the face as opposed to spurt pumps having to pull fluids. Submersibles are more effective than spurt pumps.



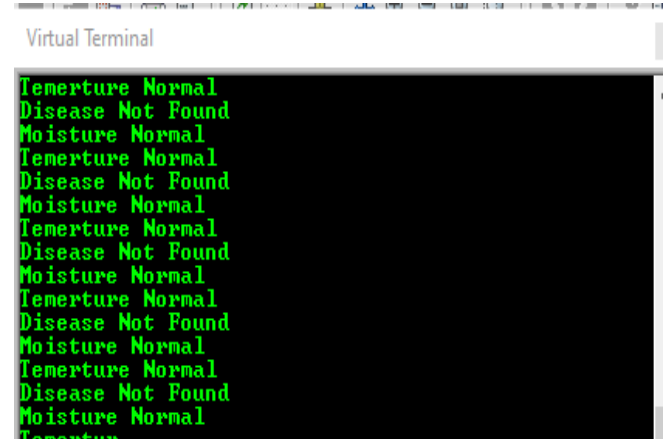
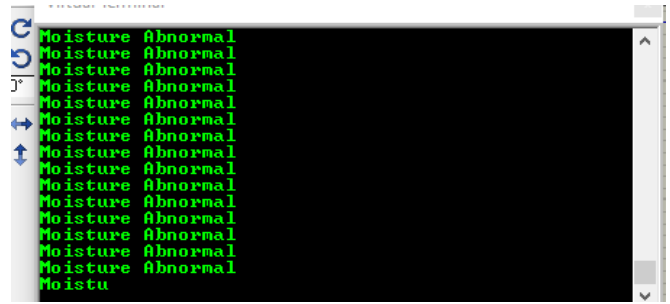
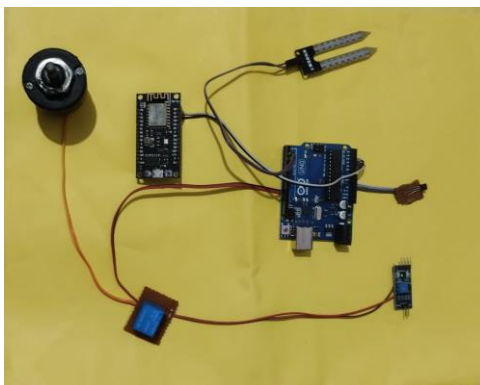
Pump motor

## V. RESULT AND DISCUSSION

### RESULT

The Arduino controller collects the details from different sensor. The sensors are located in different places and collecting the data. These sensor readings are send to the server with the help of WI-FI module. the output are displayed in using app. Suppose the sensors value is normal the app will be display on like moister is normal or temperature is normal then the sensor value is increased or decreased the app will be display on like moister is abnormal or temperature is abnormal. The pumb motor is used for measuring the water level. The water level is below particular range the motor is automatically going to ON state.

### OUTPUT



## VI. CONCLUSION

The agriculture field is being monitored and controlled by android app at user end. The ESP8266 is the device at field end which receives the messages from broker network and manipulates it and will perform the function mentioned in message. After it will send the messages to broker network and in turn it will be published to the Client (user end). The ESP8266 is the best device for IoT projects. Since it is small, compact, lightweight, easily programmable, and easily installable and has enough GPIO pins to use them. Agriculture irrigation system is developed with low complex circuitry. A two sensors are used efficiently those are temperature and moisture of soil in the circuit to get the calibrated information to the system. Two sensors and microcontrollers of all three Nodes are successfully interfaced various Nodes. All observations and experimental tests prove that proposed is a complete to field activities, irrigation problems. Implementation of such a system in the field can definitely help to improve the field of the crops and overall production.



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