



## AGRI-BOT

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**Abstract:** The aim of this paper is to farm using new technology, automation of farm activities can transform agricultural domain from being manual and static to intelligent and dynamic leading to higher production with lesser human supervision in order to reduce human energy and time. This paper proposes an automated water and pesticide spraying system which monitors and maintains the desired soil moisture and temperature levels. Microcontroller on Arduino uno platform is used to implement the control unit. Information from the sensors is regularly updated on a web page and also sensor readings are transmitted to a thing speak channel to generate graphs for analysis using IoT.

**Keywords:** - Humidity sensor, Soil moisture sensor, Wi-Fi module, Bluetooth module, Arduino UNO

### 1. Introduction

India is a country of Agriculture and Agriculture is the backbone of Indian economy. Knowing when and how much to water for Irrigation, Automation in irrigation system makes farmers work much easier. Chemical pesticide spraying is the most powerful process in agricultural fields and greenhouse to protect the plants from the pests. In our country we do not have sufficient machinery factors in agricultural sector and it increase the load of labor on our farms. It's time to automate the sector to overcome this problem. In 70% people depend on agriculture, so we need



to study the agriculture. Innovative idea of our project is to automate the process of irrigation and inspection of soil nutrients periodically to yield the nutritious crops.

Nowadays instrumentation and control system play an important role. We develop a system for Agri-bot using microcontroller which is very economical and beneficial. Due to automation the work become easiest, errorless and it saves money also.

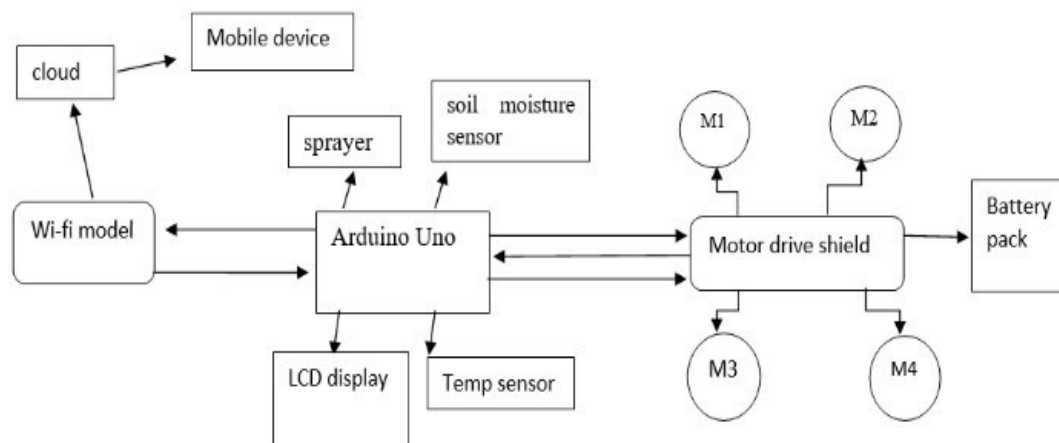
Robotics in agriculture is not a new concept; in controlled environments (green houses), it has a history of over 20 years. In this project an autonomous Agri-bot prototype is made which is capable of spraying pesticides and water to the plants in the field. This prototype is implemented and controlled with an Arduino uno R3 microcontroller and some components

## **2. Literature Survey**

- [1] “Smart Agriculture with AI sensor by using AGRO\_BOT” by B.RAGHAVI and group in 2020 4th international conference on computing methodologies and communication (ICCMC). This paper focus on AGRO\_BOT fully depends on sowing seeds and further more observed by arm processor and cloud based IOT Agriculture.
- [2] “Autonomous cloud robotic system for smart Agriculture” by T.DHARMASENA and group in 2019 Moratuwa engineering research conference(MERCON).This paper proposes a automated system to optimally control the climate and irrigation in a greenhouse by monitoring temperature ,soil moisture , humidity and PH through a cloud connected mobile robot
- [3] “AI based greenhouse farming support system with robotic monitoring” by S.FERNANDO and group in 2020 IEEE region 10 conference (TENCON).This paper is an attempt to minimize the cost of maintaining greenhouse environments using new technologies.

- [4] “IOT based soil nutrition and plant disease detection system for smart Agriculture” by S SUHAGH and group in 202110th IEEE international conference on communication systems and network technologies (CSNT). This paper proposes a framework for IOT based soil nutrition and plant disease detection which uses various sensors to collect the plant related data and in maintaining crop health as well as quality
- [5] “IOT based multipurpose Agri-bot with field monitoring system” by S.GUPTA and group in 2020 international conference on industry 4.0 technology (ICIT). This paper is to design development and the fabrication of Agri bot which is multipurpose bot can perform all the farming operation like ploughing soil of the field, sowing seeds in the ploughing area making the field in a plain by using levelers and watering the crops

### 3. Architecture



**Fig 3.1 Block diagram**

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We proposed an automated Agri-bot ATmega328p Arduino UNO where we give the power supply or battery to get start the Agri-bot. The Agri-bot having 4 dc motors M1, M2, M3, M4 of 100RPM which makes the Agri-bot move. Motor drive will manage the entire movement of the Agri-bot. Humidity, soil moisture sensor to detect the readings of humidity, temperature and moisture of the soil respectively. Bot had one LCD display where the data of the sensor is going to display over and the recorded data will be sent to cloud through Wi-Fi module. Wi-Fi module is connected to Arduino UNO and establish TCP connection through receiver (RX) and transmitter (TX)

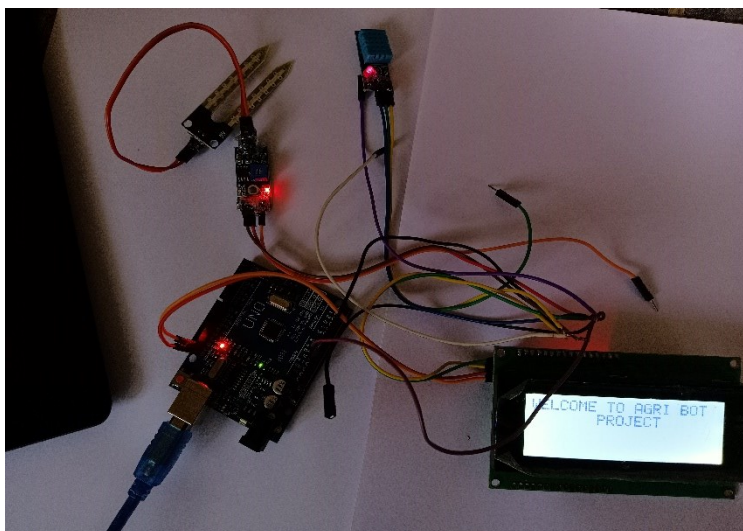
Spraying can be done in two ways by water pump. While spraying water it will check the moisture of the soil and decide whether to spray the water or not based on the condition written in the program related to the particular field. Whereas the pesticide can be sprayed through the water pump itself when needed. The water pump can be controlled by the 4channel relay model.

Agri-bot can be controlled by the Arduino Bluetooth control app, which will interact with the Bluetooth module. Every data will be sent to the ThingSpeak cloud where admin can check out the status Agri-bot and environmental condition

#### 4. Results



**Fig 4.1: LCD Screen**



**Fig 4.2: Soil moisture and humidity sensor with Arduino**



**Fig 4.3: Water pump set up with 4 channel relay**



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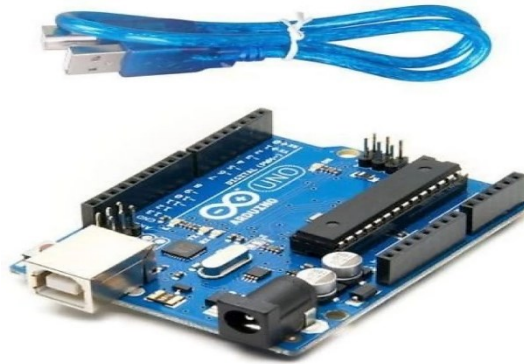
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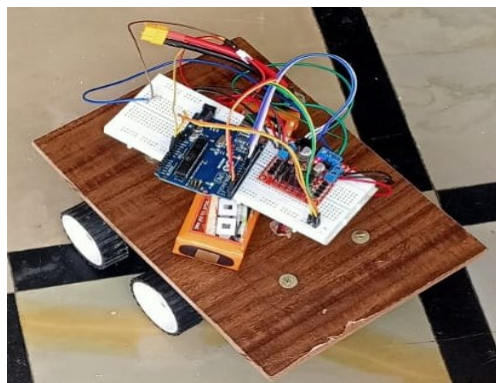
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**Fig 4.4 : Arduino Uno**



**Fig 4.5 : The Basic image of Agri-bot**



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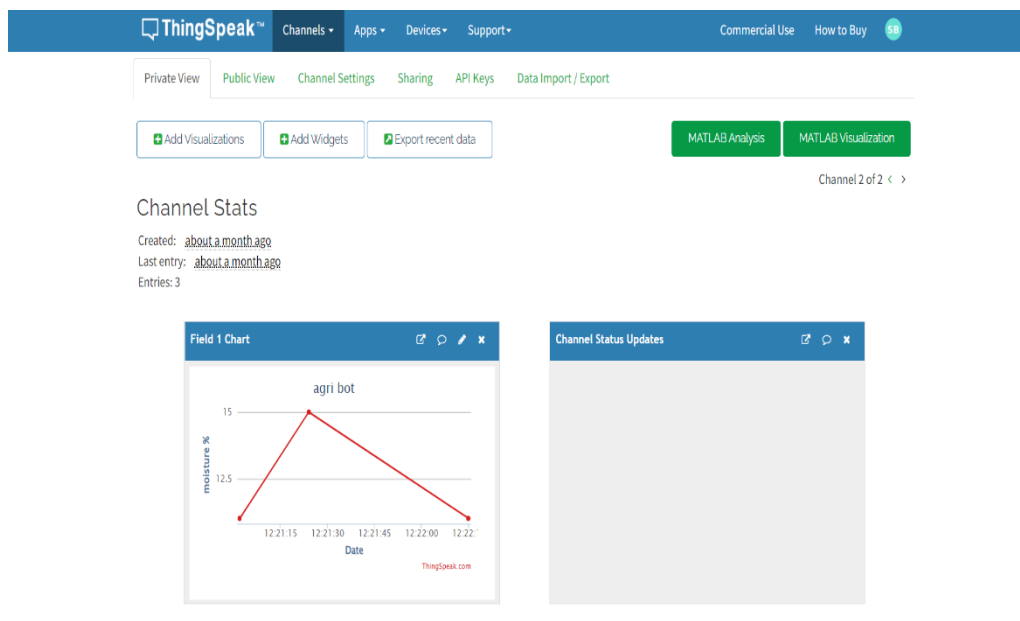


Fig 4.6: Data uploaded to ThingSpeak

### 5. Conclusion

More than 60 percent of the population in the India, agriculture as the primary sector occupation. In recent years, due increase in labor shortage interest has grown for the development of the autonomous vehicles like robots in the agriculture.

This project works on the automation done in the agriculture field to make field work easier and save man power by spraying the pesticides and watering the plants by proper stats and not going to tired or sick until battery drains. This prototype could be environment friendly and low cost model for the farmers in real time.



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