



# International Journal of Advanced Research in Arts, Science, Engineering & Management

Volume 10, Issue 2, March 2023



INTERNATIONAL  
STANDARD  
SERIAL  
NUMBER  
INDIA

**Impact Factor: 6.551**

# Arduino Based Agriculture Robot Using Wi-Fi Module

<sup>1</sup> Mr. Shankar Pai B, <sup>2</sup> Abhijith, <sup>3</sup> Binumohan K D, <sup>4</sup> Rohith, <sup>5</sup> Ullas N M

<sup>1</sup>, Professor, Dept. of Electrical and Electronics Engineering, Yenepoya Institute of Technology, Moodbidri, Karnataka, India

<sup>2,3,4,5</sup>, Students, Dept. of Electrical and Electronics Engineering, Yenepoya Institute of Technology, Moodbidri, Karnataka, India

**ABSTRACT:** Agriculture is one of the oldest forms of occupation. The use of tools and livestock in the agricultural process has reduced the human effort. Major factors that affect agriculture include less holding area, shortage of seeds, fertilizers, labour, and uncertainty of monsoon. The mechanization of agriculture refers to the use of tools or machines in the agricultural process that potentially reduces the human effort. Although it reduces the human effort in the agricultural process, it requires complete human interaction. The automation and robotics application in the branch of agriculture is at the booming stage when compared to its wide range of application in other sectors. Many researches have been done in this field to automate the process. In the present paper an effort is made for the design and development of the robot that can perform various farming operations like ploughing, field levelling, seeding, watering and pesticide spraying. The robot is basically a four-wheel robotic car.

## I. INTRODUCTION

Agriculture was the key development in the rise of human civilization. As the time passed, we have seen remarkable changes in the field of agriculture due to the introduction of new technology which has resulted in the development of world agricultural market. Robotics is the branch of technology that deals with the design, construction, operation and application of robots, as well as computer systems for their control, sensory feedback and information processing. The system that can do agricultural work without the need of human intervention is the need of today's world. These types of intelligent systems having robust and feasible model with several functionalities is the demand of future in every field of technology. Precision farming plays a vital role in agriculture field to fulfil the demand of agricultural sector and food industry. Agriculture is an expensive wildly wasteful industry. The precision farming movement may not solve every problem the industry face, but it have the potential to improve sustainability and efficiency. Before this, precision agriculture equipment was only available in the form of heavy machinery. That is why our system brings precision agriculture technology to environmentally conscious individuals.

This project aims to develop and design of the robot which can plough the field, sow the seeds and cover seeds with the soil all the operations at single time. We will use a DC power for both Arduino and the motors. The plough and the mud leveling equipment are attached to the mechanical frame. While the 4 DC motors are used to operate the wheels of the robot. A separate dc motor is used for the seed sowing function. With the help of Wi-fi module we will give all the commands to the robot through our mobile phones.

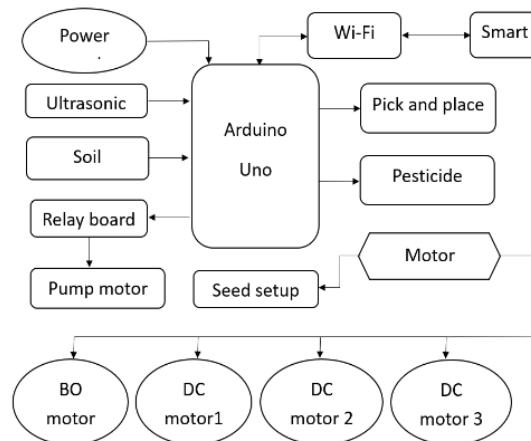
## II. LITERATURE REVIEW

Shivaprasad B S, Ravishankara M N, B N Shoba "Design and Implementation of Seeding and Fertilizing Agriculture Robot" International Journal of Application or Innovation in Engineering & Management (IJAIEM) held at Mumbai, India. In this paper, in order to eliminate challenges in horticulture, the sudden increase in industrialization affecting the workers belongs to villages and planning to shift well developed area. This results in worker related issues in horticulture. Worker is getting more income. As the fare of artefact such as day to day essentials rapidly raising workers prefer comparatively more wages from the managers. Due to this reason rancher will be affected and pasture will be left uncultivated. Fertilizing and sowing operation carried out as a substitute for human. This article tends to profitable for ranchers who are pursuing ranching operation with problems of labor Shreyash Kulkarni, Rahul Kumbhar, Krunal Mistry, Shravan Nithurkar: Multipurpose Agriobot, IOSR Journal of Engineering (IOSRJEN). In this paper author describes a system that can used for farming operations like seeding, watering, and fertilizing. It is a four-wheel robotic car controlled by ARDUINO microcontroller. There are 4 seeding wheels so that parallely 4 tracks can

be sown at a time. For watering purpose, they have used water pump which pumps the water at specific interval and the same watering mechanism is used for pouring wet fertilizers.

Neha S. Naik, Virendra. V. Shete, Shruti. R. Danve. Precision Agriculture Robot for Seeding Function, IEEE International Conference on Industrial Instrumentation and Control, May2015. In this paper the author gives an overview of the proposed system. The prototype of an autonomous Agriculture Robot is presented which is specifically designed for seed sowing task only. It is a four-wheel vehicle controlled by LPC2148 microcontroller. Its working is based on the precision agriculture which enables efficient seed sowing at sowing at optimal depth and at optimal distances between crops and their row, specific for each crop type.

### III. PROPOSED METHODOLOGY



**Figure1:**Schematic Representation of the Proposed system

In this robot, we are using the sensor to find the conditions of agriculture land and motor drive is using to operate the robot forward, backward, right side and left side. The ultrasonic sensor is using find an obstacle in way of moving time and soil moisture sensor is using to find the dry and wet conditions in agriculture land. If we find any dry plant pick and place is help to remove the dry plant and we sowing the seed in that place after that supply the water to the seed in this method this all process is controlled by Arduino Uno.All the instructions are given through Wi-Fi module from android application.

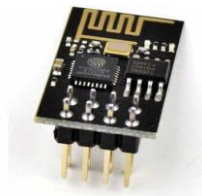
### IV. FUNCTIONAL DISCRIPTOION

**Arduino UNO:**



Arduino can interface with PC using Extended Serial Bus (USB) strategies. The Arduino could be an organized microcontroller placed on a board that feasibly connects to major PCs. It allows the customer to program the featured at mega chip to do a variety of tasks.

**Wi-Fi Module:**



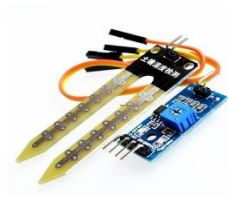
The instructions are given through Wi-Fi module form android application

**Ultrasonic sensor:**



Ultrasonic sensor is device which is used to detect the object

**Soil moisture sensor:**



It is utilized in a programmed plant watering framework or to flag a caution of some sort when watering is needed by plants.

**DC water pump:**



DC water pumps utilizes direct current from battery to move fluidina different way.

**Motor driver:**



This engine driver board is perfect for mechanical applications and appropriate for association with a Micro controller requiring only a few control lines for every engine.



**MODEL :**



prototype

**V. CONCLUSION**

In this project we have built a farming robot which can perform multiple functions such as ploughing, field levelling, seeding, pesticide spraying and watering. We have efficiently built the proposed robot to reduce man power and health hazards caused by chemicals during pesticides spraying. The 3 seeding wheels reduces the time taken for sowing the seeds manually and 3 outlets of water helps in spraying water in less time. Also, the automatic navigation implemented helps in doing all the farming operations without human intervention. Thus, the skill labour required is less and the health hazards to the farmers is reduced significantly.

**REFERENCES**

1. Shivaprasad B S, Ravishankara M N, B N Shoba “Design and Implementation of Seeding and Fertilizing Agriculture Robot” International Journal of Application or Innovation in Engineering & Management (IJAIEEM) held at Mumbai, India, Volume 3, Issue 6, June 2014, PP. 251-255.
2. Shreyash Kulkarni, Rahul Kumbhar, Krunal Mistry, Shravan Nithurkar: Multipurpose Agribot, IOSR Journal of Engineering (IOSRJEN) Volume 09, Issue: 4th April-2019.
3. Neha S. Naik, Virendra. V. Shete, Shruti. R. Danve. Precision Agriculture Robot for Seeding Function, IEEE International Conference on Industrial Instrumentation and Control, May2015.
4. AkhilaGollakota; M. B. Srinivas “Agribot— A multipurpose agricultural robot” 2011Annual IEEE India Conference held at Hyderabad, India. PP: 1-4.
5. Saurabh Markar; Anil Karwankar “Automated seed sowing agribot Using Arduino”2016 International Conference on Communication and Signal Processing (ICCSP) held at Melmaruvathur, India. PP: 1379-1383.
6. Swati D. Sambare, S. S. Belsare, “Seed Sowing Using Robotics Technology” International Journal of scientific research and management (IJSRM)Volume 3, Issue 5, 5 May 2015, PP. 2889-2892.International Journal of Industrial Electronics and Electrical Engineering (IJIEEE) Volume-4, Issue-2, Feb.-2016, PP. 12-15.
7. Ashish Lalwani, MrunmaiBhide, S. K. Shah, “A Review: Autonomous Agribot for Smart Farming” International Journal of Industrial Electronics and Electrical Engineering (IJIEEE) Volume-4, Issue-2, Feb.-2016.
8. K DurgaSowjanya; R Sindhu; M Parijatham; K Srikanth; P Bhargav “Multipurpose autonomous agricultural robot” 2017 International conference of Electronics, Communication and Aerospace Technology (ICECA) held at Coimbatore, India.



INTERNATIONAL  
STANDARD  
SERIAL  
NUMBER  
INDIA



# International Journal of Advanced Research in Arts, Science, Engineering & Management (IJARASEM)

| Mobile No: +91-9940572462 | Whatsapp: +91-9940572462 | [ijarase@gmail.com](mailto:ijarase@gmail.com) |

[www.ijarase.com](http://www.ijarase.com)