

# Internet-of-things(IoT) Based Agricultural Robot

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**Abstract** - Agri-bot is a gadget, that makes complex tasks easy to perform by making use of software programs. It substitutes the convectional techniques to perform similar tasks with more efficiency. Affixing automation in agriculture has helped create various advancements to the industry, it saves farmer's time and money. By making use of Bluetooth medium of an android smartphone the agricultural robot can be monitored. The sensors interfaced with microcontroller and motors designs the entire calculation process, monitoring and processing. Usually people are careless to water the plants on their gardens and rooftops daily, this part explains an in complex and appealing automatic plant watering system which can be built by ourselves in just few hours, by making use of an IR sensor, automatic plant watering system is created, which is based on raspberry and raspberry pi. These agribots can be used for harvesting pesticide spraying, controlling weed and many other applications.

**Key Words:** Agri-bot, efficient, Bluetooth medium, Raspberry, Harvesting, Controlling weed.

## 1.INTRODUCTION

Agriculture is the backbone of economic system of a specified country standard techniques of farming rely on Man power and old procedures such as the application of synthetic chemical fertilizers, pesticides, herbicides and genetically changed creatures. To carry out similar tasks with efficiency, we make use of agricultural robotics. Agribots can spot the existence of diseases, weeds, insect infestations and other stress circumstances. Agri robots are lightweight. Agricultural robot can be controlled by an android application which is helpful for the farmers livelihood. An android application is used to monitor Agribot. This indeed supports the farmer's livelihood. Nevertheless, current methodologies that permit highly mechanised group of primary phenotypic data for compact numbers of plants in the greenhouse fall far short of the requirement to look into and distinguish plenty of

plants under real world circumstances. Building structures that can gather multi-modal, multi-character data in real time in the field needs joining plant biology and crop science with robotic vision and computer engineering. These structures should be precise and dependable, and should supply exceptional facts than the present routine accessible for automated greenhouse or physical field phenotyping. This will assist us to associate plant genotypes in additional to the molecular and ecophysiological responses with the interpretation of particular phenotypes in retaliation to the flourishing surroundings.

## II. LITERATURE SURVEY

1. "Smart farming using agri-bot"(K. Gowthami, K. Greeshma, N. Supraja,IJAER,2019)

This paper offers a system which performs the seeding process in the agricultural field. The main idea behind this development is to perform agricultural tasks without human intervention and to implement a prototype of an effective low cost agribot. This project is based on a wireless communication by making use of Arduino and Bluetooth.

2. "Automatic weed detection and smart herbicide spray robot for corn fields" (G.Sowmya, J.Srikanth,IJSETR,2017)

This paper designs and develops a robot to detect weed in corn crop, by making use of image processing. The advantages of this project is time saving as it detects the beets with the help of a camera and the herbicides are sprayed on the infected crop, saves the farmers from tedious work.

3. **“Designing of an Autonomous Soil: Monitoring Robot”** (Patrick M. Piper and Jacob

Vogel, IEEE, 2015)

This paper designs and develops a robot for monitoring of soil. This robot is capable of sensing the moisture and the temperature of the soil through Stevens Hydra Probe II and it consists of GPS to navigate.

4. **“IoT Based Smart Agriculture-towards making the fields talk”** (Muhammad Ayaz, Mohammad

Ammad-uddin, Zubair Sharif, Ali Mansour, and el-

Hadi M. Aggoune, IEEE, 2019)

This paper proposed a multitasking IOT based technology in the agricultural field. The idea of this structure is to help farmers produce high quality yields to meet the rising demand of food with the increased population, by making use of wireless sensors, UAVs, cloud computing, and communication technologies. The system proposes a complete technology based farming from the start till the harvesting which includes very less human interaction.

5. **“Image processing-based intelligent robotic system for assistance of agricultural crops”** (Nikhil Paliwal, Pankhuri Vanjani, Jing-Wei Liu, Sandeep Saini and Abhishek Sharma, IJSHC, 2019) This paper determines a prototype model of image processing based IOT robot which helps in identification of the leaf infection. This consists of UGV and UAV usage which helps in detecting the disease, soil data connection and in the classification of the field to provide solutions for mixed cropping. The main purpose of this paper is to help farmers with early detection of disease.

6. **“Agricultural Automation System with Field Assisting Robot-AgroBot”** (C. Jeeva, Saher Mairaj,

Archit Keshav Gangal and Farheen, IJPAM, 2018) This system consists of Arduino UNO which acts as the heart of the system. This system consists of a camera, to detect the obstacles falling in its path which will help in taking the required actions and it proposes three main functions: Ploughing, seed dispensing and harvesting. The main idea behind this is to design a multitasking robot which in turn reduces the working hours, cuts down on labour expenses and helps in the correct way of seeding.

7. **“Design and Implementation of Agrobot with Automatic Sun Tracking”** (V. Radhika, B. Sharmila, R. Ramya, M. Gopisri, IJEAT, 2019)

This proposed agrobot consists of Arduino, solar panel, GSM module and sensors. Solar panels are used to charge the robot. The ultrasonic sensors detect the hurdles and also help in digging of holes for sowing seeds at a predefined distance. pH sensors help in the computation of the moisture content in the soil. Electrochemical sensor helps in identifying the fertility of soil and the optical sensor helps in the movement of the robot. The main aim behind this system is to reduce farmers' burden and help obtain good amount of yields.

8. **“AGROBOT: Sowing and Irrigating Farming Machine”** (Shubham Khandelwal, Neha Kaushik, Sagar Sharma, IJAR, 2017)

This structure has a vehicle operated ATMEGA328 microcontroller which acts as the master operator. It performs four functions such as ploughing, seeding and harvesting of crops and irrigation. Solar panels are made used in order to recharge the batteries. The robot moves automatically if the length and the width of the field is provided. The aim of this system is to help farmers with good yield of crops and to minimize the usage of non-renewable sources.

9. **“AGROBOT: Sowing and Irrigating Farming Machine”** (Ponnu Priya Saju, Anila P.V, IJREAM, 2019)

This system is controlled by ARM CORTEX M3 based microcontroller. FC-28 is used for soil

moisture detection. LPC1769 microcontroller controls the seed sowing and irrigation operation. Relay is used to carry out the watering operation, the microcontroller sends in a high signal when the moisture level is low and the relay is turned on. This prototype is built using aluminium square tubes and foam board in order to reduce the weight. The main aim behind this system is to help farmers with precision farming.

#### 10. "IoT Based Precision Agriculture Using AgriBot"

(Mr.V.Gowrishankar ,

Dr.K.Venkatachalam, GRDJE, 2018)

The paper provides information about the demonstration and working of Agribot controlled by IoT. This robot carries out varied functions such as ploughing, seeding and spraying of pesticides. servo motor and solenoid valves are implemented in order to the mechanism of seeding and spraying of pesticides. the moto of this project was to aid the farmers with a good yield of crops and to avoid direct contact with chemical pesticides.

#### 11. "IOT Enabled pesticide Sprayer with security system by using solar energy" (Amaresh.A.M. Anagha G Rao, Fennaz Afreen, Moditha.N, IJERT,2020 )

This paper brings froth the information about the implementation of agricultural robot through an android application. this robot is used for spraying of pesticides with the help of solar powered pumping system. The movement of the robot betwixt the crops is monitored by the farmer with the help of android application. If there's an invader in the field then the robot captures the image of the invader and sends it to the farmer. This robot can be used to during the COVID sanitization for spraying of sanitizer. the main agenda of this project is to build a nominal equipment which can be afforded by farmers, in order to increase the yield of the crops and reduce contact with the chemical pesticides.

#### 12. "Solar Powered Agribot for FarmMonitoring using Interent of Things(IOT)" (Sivaprasad Athikkal, Ambarish Pradhan, Abhilash Gade, A. Mahidhar Reddy, IJEET,2020)

This proposed Agribot consists of IR, moisture and temperature sensors. In order to make use of the naturally available sunlight they have used solar panels. The sensors check the temperature of the soil and irrigates the land depending on the temperature and then feeds the data to the cloud. this robot will change the path if an obstacle occurs. the main intention behind this project is to build a economical robot to help the farmers and to make use of the available natural resources.

### 3. CONCLUSIONS

This paper is primarily based on keeping down the labour force and price of machinery, that will be economical to the farmers. The current successful robots needs a skilled technician because these robots constitutes the use of powerful fuel based IC engines and hefty machinery, It also causes needless environmental pollution and it also causes cut down in fossil fuel. To overcome these issues, the usage of automation agrobot is applied by this project. This device cultivates the field on its own. This automated device called as "Agri-Bot" is distinctively built to ease the farmers so that the demand of food is accomplished conveniently. An agribot delivers enhanced result than hand-operated structure. It is an automated agribot, which is operated on the basis size of field, size of seed and in which mode it is functioned. This agribot should be handled by making use of an algorithm for the well-being of farmers and linked by making use of Arduino board. We foresee that this agri-bot will modify the method of farming in the approaching days. The application of robot significantly saves time, energy, labour, and also it is inexpensive. Thus, farming is made simple and efficient.

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