Voice Controlled Agribot

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***Abstract*:- Due to an increase in labour shortages in recent years, interest in agricultural technology development has increased. A robot dubbed the voice controlled agribot was created for agricultural uses and works by following user orders. It is intended to reduce human requirements while increasing work efficiency. It performs the basic activities needed in farming, such as pesticide sprinkling, water supply, and robot movement. The main goal of our project is to create a robot that can recognise voices and carry out commands. It may be manually controlled using an android application on an internet-connected device. As a result, it may be beneficial to physically disabled people. Through bluetooth voice control, the robot prototype will be able to receive voice commands from the mobile.**

I. INTRODUCTION

A robot is an electromechanical equipment or gadget that can execute a variety of physical tasks and is controlled by a computer programme or an electronic circuit. With the advancement of technology, scientists have come up with new robot concepts and creations. Agriculture is the most common scenario in our daily lives. Agriculture supports 70% of the population in India. However, the value is declining day by day due to a variety of factors. Everyone must realise that there is no food without a farmer, and there is no living without food. As the seasons vary, so does the production of food grains. Precision agriculture is supported by IT, such as automatic fertiliser spraying machinery and irrigational infrastructure. The internet has been a fantastic instrument for improving communication and establishing these features.Agriculture machinery is becoming more intelligent and automated in the twenty-first century. The agricultural robot can carry out simple tasks such as spraying pesticides, pumping water, and mowing the lawn. Precision autonomous farming is the use of autonomous machines to guide, control, and perform agricultural tasks. It encourages the development of agricultural robots. Agricultural robots' major purpose is to serve humanity by increasing agricultural efficiency and technology. Agriculture is India's primary source of income. Agriculture is extremely important to our country's economy. Water usage is increasing every day, resulting in an issue of water scarcity. Food quality is affected as a result of this.

If farming is done manually, a lot of manpower is required, and the requisite quality job is not achievable. Seeds and fertilisers are also squandered due to inefficient utilisation. The manual harvesting approach takes longer and is more expensive. Chemicals used in pesticides are poisonous and dangerous to humans, and if they do not pay attention while spraying, they will suffer from respiratory ailments. To create a robot that can recognise voice orders and do tasks accordingly. It can be manually controlled via an Android smart phone app or other internet-connected device. To make the farmer's hard work easier in less time than the old method. Work is accomplished in a timely and accurate manner.

II. WORKS IN CONNECTION

[1] Ankit Singh, Abhishek Gupta, Akash Bhosale, and Sumeet Poddar published "Agribot: An Agriculture Robot" in January 2015.They propose an agricultural autonomous Robot in this paper. The Robot will feature a cutting and picking mechanism in addition to spraying pesticides on the crops. It will also have a camera that can provide a live image of the sector while it performs its fundamental functions, allowing it to monitor everything. For large farms, a GPS-based module is frequently implemented, depending on our ability to fix a specific piece of land to be harvested in which pattern or style. A second spraying mechanism is also featured in the robot, which may spray insecticides on the crops.

[2] Suraj Chavan, Anilkumar Dongare, Pooja Arabale, Usha Surayanwanshi, Sheethal Nirve, "Agriculture Based Robot (AGRIBOT)" -2017.In this study, they need to increase productivity while reducing labour costs; their robot is designed to do the basic duties that must be performed in farms. They wanted to create a multitasking farm robot that could specialise in plantation operations.

[3] Deepika.D, K. Deepikha, M.G. Gomathi, and Mr. A. Ponraj – "Agribot for Polyculture and Crop Monitoring" – Mar-2018.

In this work, a robot system is employed to construct an agricultural land cultivation technique that does not require human labour. This method saves time while simultaneously boosting output. The edge level for moisture and temperature for each soil is determined by collecting samples of numerous soil types.

[4] K Gowthami, K Greeshma, and N Supraja -2019 "Smart Farming Using Agribot" The goal of this research is to demonstrate the current status of agricultural and autonomous system trends and implementation, as well as future application possibilities. Different applications of autonomous vehicles in agriculture are explored and compared to traditional systems, with crop establishment, plant care, and selective harvesting identified as the most practicable. The vehicle is controlled via

an Android application that communicates with the hardware through Bluetooth. The language input allows a user to interact with a robot that most people are familiar with. These robots have two advantages: they are hands-free and can input data quickly. In the field of agricultural autonomous vehicles, an idea has been developed to investigate if numerous small autonomous machines can work together.

[5] "Agricultural Robot" – Kavitha Zole, Sanghasevak Gedam, Aditya Dawale, Kiran Nikose, and Jayant Hande – Feb-2018

In this study, the author attempts to design an agricultural robot that performs advanced agriculture processes using an electronic and mechanical (Mechatronics) platform. This research aims to create a robot that can do tasks such as autonomous ploughing and seed dispensing. We created an electromechanical car with a DC motor that drives the wheels. The farm is cultivated by an automated system that considers specific rows and columns depending on the crop. The solar panel is utilised to charge the DC battery in this project, which is operated remotely.

III. BLOCK DIAGRAM

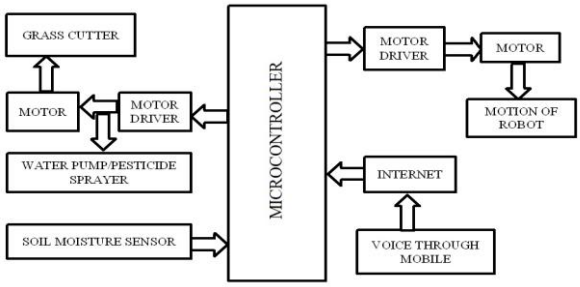


Fig 1 Block Diagram of Voice Controlled Agribot

To begin, we employed a microcontroller, which is used to operate embedded system functions, motors (dc motors), and a variety of other devices. The microprocessor is linked to the motor driver, which acts as an interface between the dc motor and the microcontroller. The microprocessor operates on low current impulses, whereas the dc motor requires a lot of current. Motor drivers' main role is to convert a low current control signal into a high current signal that can drive a dc motor. The grass cutter is attached to the dc motor, which rotates at a high speed to assist in grass cutting. The soil moisture sensor is then attached to the microcontroller, which uses the relationship between electrical and water content to determine whether the soil moisture levels are low. When the water level in the reservoir falls below a certain level, the water pump automatically turns on and supplies water to the field. This dc motor is attached to a pesticide sprayer, which sprays chemicals in an orderly fashion to protect plants from insects and disease. These types of agribots are operated via the internet (voice through mobile via google assistant or Bluetooth). We can control agribot with spoken commands using the Voice Access app for Android.This project's main goal is to create a versatile tool. Agriculture robots are used to cut the grass, spray pesticides, and spray water with little modifications in the environment. This entire robot system works with battery power. The robot's basic frame is created with three wheels and the back wheels are linked to the motor. Water is sprayed from the water pump. With the use of Bluetooth connectivity, the robot receives data through Bluetooth module. This is an Arduino program. The data is subsequently sent to the relay module, and the switch is turned on or off.

3.1 Arduino UNO

Fig 2 Arduino Uno

The Arduino Uno has a set of analog and digital pins that serve as input and output points for connecting the board to external components. In board, there are a total of fourteen I/O pins, six of which are analogue input pins. The board contains a USB port that can be used to connect to a power supply.

3.2 Motor Driver

Fig 3 Motor Driver

A typical Motor driver, also known as a Motor Driver IC, allows DC motors to be driven in either direction. The L293D is a 16-pin IC that can operate two DC motors in any direction at the same time. It means that a single L293D IC may operate two DC motors. Integrated circuit for dual H-bridge motor drivers (IC).

3.3 DC Motor

Fig 4 DC Motor

A Direct Current (DC) motor is a revolving electrical device that transfers electrical energy into mechanical energy using direct current. When DC voltage is given to its terminal, an

inductor (coil) inside the DC motor produces a magnetic field that causes rotary motion.

3.4 Soil Moisture Sensor

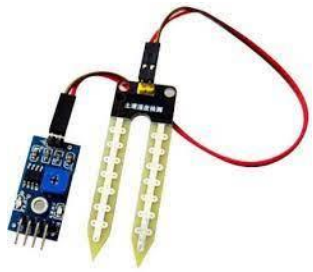


Fig 5 Soil Moisture Sensor

The Soil Moisture Sensor Module measures the resistance between two metallic probes put into the soil to be monitored to detect the quantity of soil moisture.

3.5 Water Pump

Fig 6 Water Pump

3-6V Micro DC Submersible Pump This is a low-cost, small-size Submersible Pump Motor that runs on a 3-volt power supply. It can process up to 120 litres per hour while drawing only 220 milliamps.

3.6 Arduino IDE

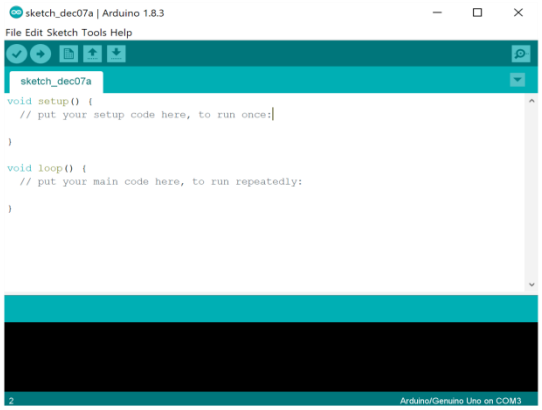


Fig 7 Arduino IDE

The Arduino Software (IDE) includes a text editor for writing code, a message box, a text console, a toolbar with buttons for basic functions, and a series of menus. It communicates with the Arduino hardware and uploads applications to it.

3.7 Thingspeak

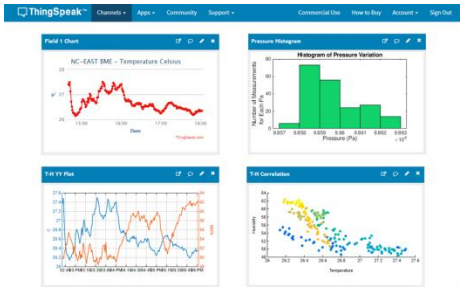
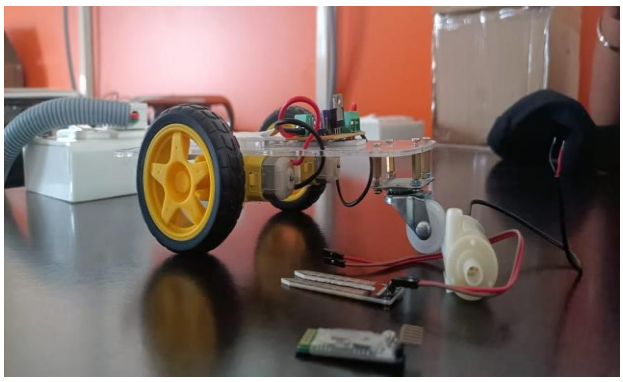


Fig 8 Thingspeak

ThingSpeak is a cloud-based analytic IoT platform that lets you gather, view, and analyse live data streams.

IV. IMPLEMENTATION AND RESULT DISCUSSION

Implementation:



With its multitasking functioning capabilities, the voice operated agribot in this project has been created to assist farmers in easing their work and increasing production by carrying out various agricultural chores such as spraying pesticides and giving water to the agriculture field. The Agribot will help farmers increase crop yields while also protecting them from dangerous pesticide chemicals. The goal of this initiative is to reduce farmers' labour while also boosting the speed and accuracy of their operations. The Agribot is operated by voice, allowing us to control the equipment on a huge scale

over a long distance. This will allow the farmer to execute agricultural tasks from afar without having to enter the field, and with greater control.

V. CONCLUSION

With its multitasking working features, the voice controlled agribot in this project has been designed to assist farmers in easing their work and increasing productivity by carrying out various agricultural activities such as spraying pesticides, grass cutting, alerting the bird, supplying water to the agriculture field, and continuous image capturing and monitoring of the field. Farmers can observe their land from anywhere in the globe thanks to live broadcasting from the fields. The Agribot will help farmers increase crop yields while also protecting them from dangerous pesticide chemicals. The goal of this initiative is to reduce farmers' labour while also boosting the speed and accuracy of their operations. The Agribot is operated by voice, allowing us to control the equipment on a huge scale over a long distance. This will allow the farmer to execute agricultural tasks from afar without having to enter the field, and with greater control.Agribot can be made autonomous in the future to conduct numerous agricultural tasks. The research shows that there is tremendous potential for using the autonomous system in various agricultural processes when suitable control and safety regulation systems can be imposed at a reasonable cost. On the future, the robot could be used to spray pesticides in trees as a climbing robot. Weed picking and distinguishing between grass and weed can be included. It has the potential to provide farm security. We can utilise this robot to reduce human effort and labour challenges in agriculture due to a lack of human resources.

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