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Digging and Seed Sowing AGRIBOT

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Abstract- Access to Agriculture is a major first step towards a better life, the development of agricultural tools is the basis for agricultural improvement. Now the best way for this project is to develop a system that lowers operating costs and reduces the time to dig and the performance of seed sowing using agribot. In this machine DC Motors, Moisture Sensor, IR sensor, Ultrasonic Sensor are used with the help of a Wi-Fi interface running Android Application on an oeuvre robot in the field. This reduces staff dependency. The robot for sowing seeds and digging will travel through various rows of soil and perform digging, sowing seeds and covering the soil by covering it. This paper describes the complete installation of agribot including hardware and software facet. This paper describes agribot with advanced feature of soil testing.

***Key Words*: Soil Moisture Sensor, IR Sensor, Ultrasonic Sensor, Agribot, Soil Testing.**

1. INTRODUCTION

Robotics is a promising technology that contributes to almost every aspect of the global economy, from medical to space learning. However, another sector is often lagging behind in agriculture. Today the environmental impact of agricultural production is highly concentrated and demand in the industry is increasing. In the current context, most Indian cities do not have enough energy in the agricultural sector and that affects the progress of developing countries. Farmers should therefore use advanced technology to do planting work (digging, sowing seeds, etc.) The newly developed Seed Plant operates by hand or there is no workmanship done by what is expected of seed sowing. The manual method involves spreading the seeds by hand. Sometimes piercing is used to make holes and drop the seeds by hand. Bulls are also used to carry heavy loads to loosen and drop seeds. So it is time for the industry to automatically overcome this problem. There is a need to learn about the development of agricultural machinery. The new concept of the paper makes it possible to dig and plant seed seeds and cover the earth automatically so that human efforts will be reduced to 90 percent. Agricultural Robots or Agribot is a robot installed for agricultural purposes.

• Farmers are the so-called '' managers '' of agriculture. They protect the farm product from the time of sowing until the time it reaches the market. Their hard work is the reason why most of us have food on our table every day.

• Reduce the farmer's hard work through Agribot.

• Agribots do farmers' work, increase productivity and reduce industry reliance on handicrafts.

• One of the great advantages of agribots is that they can work 24/7, 365 days a year.

• Some of the major applications for robotics in agriculture include:

1. Harvesting and picking

2. Self-cutting, sowing, spraying and cutting

3. Filtering and packaging

4. Phenotyping

• As the population grows, farmers must use new technologies to keep pace with the growing demand. By 2050, an estimated 9 billion people worldwide are expected to grow. The IEEE Robotics and Automation Society states that “agricultural production must be doubled if it is to meet the growing needs of food and nutrition.”

For the use of seed sowing, we use a servo motor. This is nothing but a simple electric car, controlled with the help of servomechanism. How to sow seeds. Since the shaft of the servo motor can be adjusted to the required level connected to the hopper containing the seed, to achieve the seed sowing method the servo motor needs to be precisely controlled at the desired angle.

Our project objectives are as follows:

 Be punctual

 Maintain personal strength

 No seed shedding

Less energy

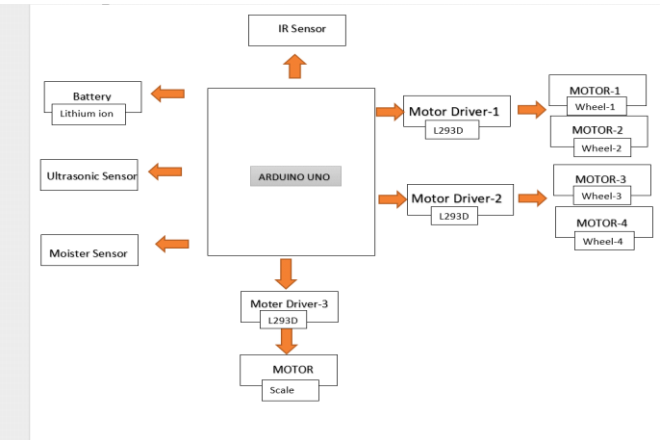

Fig. 1 System Architecture

2. DESCRIPTION OF PROPOSED SYSTEM COMPONENTS

Agriculture is the backbone of the Indian economy. About half the world's population has chosen agriculture as their primary occupation. Provinces such as Maharashtra, Punjab, and Kerala, Assam are heavily involved in agriculture. It all started as a result of the impact of the "Green Revolution" in which farmers became aware of the various strategies involved in agriculture and its beauty. Over the centuries, some modern agricultural techniques have been developed in response to advances in science. These modern methods include the use of a tractor to connect the field, the production of pesticides, the construction of pipelines and so on. As water is a major necessity in this situation, strategies have been developed that will help water the garden more easily, consume less water, and reduce human effort. These findings have improved the quality of life of farmers. Agro-Technology is a process of applying new technologies that occur in everyday life and incorporating them into the field of agriculture which improves the productivity of productive crops and the creation of a better Mechanical machine to help the agricultural field reduce the amount and time spent on a single crop. So in this project we decided to design a better photography machine available to farmers at cheaper prices and that you can sow and plant the crop at the same time.

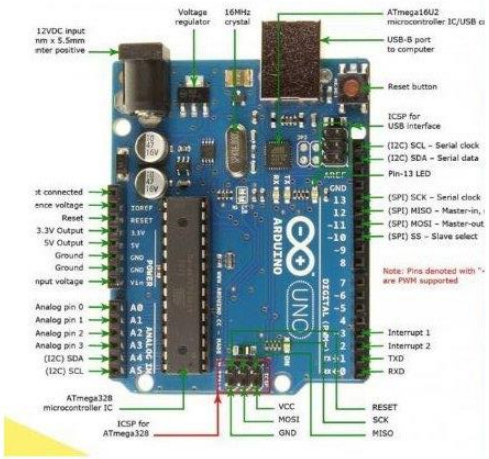

Fig. 2 ARDUINO UNO

2.1 Arduino UNO

Arduino UNO is a microcontroller board based on the ATmega328P. It has 14 digital input/output pins, 6 analog inputs, 16MHz quartz crystal, a USB connection, a power jack, an ICSP header and a rest button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. You can tinker with your UNO without worrying too much about doing something wrong, worst case scenario you can replace the chip for a few dollars and start over again.

The Arduino UNO can be powered via the USB connection or with an external power supply. The power source is selected automatically. The board can operate on an external supply of 6 to 20 volts. If supplied with less than 7V, however the recommended range is 7 to 12 volts.

2.2 Input and Output

Each of the 14 digital anchors in Uno can be used as input or output, using pinMode (), digitalWrite () functions and digitalRead () functions. They operate at 5 volts. Each pin can provide or receive a maximum of 40Ma and has an internal pull resistor of 20-50 kOhms. The ATmega328P microcontroller provides a UART TTL (5V) serial connection that can be made using digital pin 0 and digital pin 1. on the computer.

Fig. 3 Arduino Uno input output cables

2.3 Wi-Fi Module

ESP8266 is capable of hosting applications or downloading all Wi-Fi network functions from another application processor. This module has sufficient processing and storage capacity on the board which allows it to be integrated with sensors and other device-specific devices using its GPIs with minimal development before and before loading during operation.

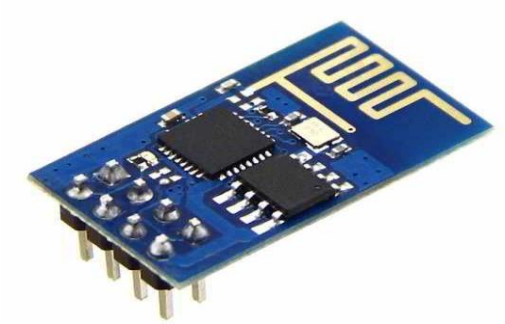

Fig. 4 Wi-Fi Module

2.4 Ultrasonic Sensor

The module from Ultrasonic HC- SR04 offers 2cm-40m. Accuracy ranging from up to 3mm. Modules include ultrasonic transmitter, receiver and control circuit. The Ultrasonic transmitter emitted an ultrasonic wave on one side, and started the moment when it was introduced. Ultrasonic dispersing in the air, and would return as soon as it encountered obstacles along the way. Eventually, the ultrasonic receiver would stop the moment when it received the reflected wave. As the Ultrasonic spread velocity is 340m / s in the air.

Fig. 5 Ultrasonic Sensor

2.5 Soil Moisture Sensor

This sensor measures the amount of water inside the soil and provides moisture as a discharge. The sensor is integrated into analog and digital output, so it can be used in both analog and digital modes. Soil moisture sensor contains two probs used to measure water volume. Two probs allow the current to pass through the ground and then find the resistance value to measure the moisture content.

Fig. 6 Soil Moisture Sensor

2.6 Infrared Sensor

An infrared sensor is an electronic device used to sense certain aspects of the environment. It does this by emitting or receiving infrared radiation. Infrared sensors are also able to measure the heat emitted by an object and detect movement. Infrared waves are invisible to the human eye. In the electric spectrum, infrared radiation can be found between visible and microwave circuits. Infrared waves typically have wavelengths between 0.75 and 1000μm.

Fig. 7 Infrared Sensor

3. RELATED WORK

Agriculture is the job of most people in developing countries. Thus having robots as well as bringing about many improvements helps farmers to complete all work efficiently and simply. Suggested a path where seeds fall to the ground as the robot

moves forward. The seeds are stored in a seed box with a tapered structure that allows the seeds to flow easily through an attached pipe and is then suitable. Explored the ground-based sensory system when defined as line and column distance. The tests were performed on wet soil and the distances covered by the robot were compared to the previously described distances. The robot can also detect the end of a field by simply detecting a field combination. Proposed the Green House Root Monitoring Robot where the robot was designed and modeled using open source software known as V-REP. Navigation planning is done with the embedded Lua typing tool and V-REP software.

1. Energy saving:

   It has been reported that by using a three-tier-drawn fertier seed line for wheat harvest, it saves 76.37 percent of man-hours and 59.92 per cent bullock-hours obtained compared to after plowing. (Mehta and Varshney, 1970) Singh (1971) pointed out that by using a ferti-seed seed sowing machine, saving 69.96 percent of human hours and 55.17 percent of huliock hours was achieved by comparison.

2. Drilling or planting a line:

   In this way the seeds are sown with a seed drill or with a ferti-seed drill. With the help of this seed use decreases at the same depth and results in the same germination and normal growth. The seed bed should be well prepared and well weighed without guards and weeds for the use of a seed drill or a ferti-seed drill. Seed drills are readily available in the market. They may be driven by bulls or by tractors. Ferti-seed drill should be used where possible to ensure uniform planting depth, good fertilizer placement and good germination.

3. Play:

   Planting or mixing of seeds in cross (+) marks made in the field with the help of the manufacturer according to the plant requirement in both directions. Manually made by dibbler. This method is followed in plants such as Groundnut, Castor, and Hy. Cotton, etc. Outstanding size and high value. This method is used in case the seed supply is limited. Sowing is done with the help of a small startup known as 'Dibbler'. A wooden or metal frame with pegs. The frame is pressed into the field and then lifted and one or two seeds are dropped by hand into each hole. It is not a standard procedure because it is a very time-consuming process. Planting seeds behind a plow: Most farmers use this method. This method involves placing the seeds by hand in furrows opened with a local plow. When the seed is placed in the trenches by hand, it is called the 'Kera' road and when it is thrown through Pora or Nai or Hazar special attachments with a local plow are called the 'Pora' road. In this way the seeds are discarded at a depth of 5-6 inches and the germination is satisfactory. Personal sowing has the problem of not providing enough space between row and row and planting for planting which results in a smaller number of crops than recommended by agricultural experts. There is also the problem of placing the seeds in the correct depth and incorporation of the right soil.

4. PROPOSED METHODOLOGY

The process of sowing seeds in agriculture is a very tedious task. Our main goal is to build this robot that can reduce human activity and make things easier. This automated robot is used to sow one seed at a time to determine the accuracy of agriculture is our main goal.

Algorithm:

1. Device Begins.

2. Open the android app.

3. Register and Sign In.

4. Connect to Bluetooth.

5. Give the Commandment.

6. Measure Soil Temperature.

7. Start DCs and servo motors to facilitate robotic operation and seed sowing.

8. Is there a barrier? Yes and do Next Performance Otherwise step 5 Performance

9. Sowing Seeds.

10. Finish.

4.1 Controller and Sensors

The main components of the hardware used are the controller (ARDUINO UNO) and the sensors. Soil moisture sensor is used to check soil moisture. Moisture is maintained by a water tank and water is pumped using an engine. Temperature sensor is used to measure soil temperature. Soil moisture and temperature are displayed on the LCD screen.

4.2 Sensor based guidance system

The sensor-based control system allows the robot to move in the right direction and to sow seeds from time to time. Here, the ultrasonic sensor is used to alert the robot to potential obstacles and to move it in the right direction. An infrared sensor is used to dispense seeds from time to time and one seed at a time. Another infrared sensor is used to detect whether a seed is present or not and if it is not present it informs us. With the help of an ultrasonic sensor and an infrared sensor the robot navigates smoothly to its proper position. The robot and its movements are viewed on the created website.

4.3 Seed sowing mechanisms

Seeds should be sown one by one at regular intervals and at the depth of the appropriate product. Here the lead is there to make depth in the soil where the seeds are sown. The robot runs smoothly through the ultrasonic sensor and the seeds are sown in the infrared sensor. It helps from time to time to sow seeds. There is a container containing the seeds where the robot starts the connecting wheel connected to the container rotating thus lifting the rod and the seed falls into the hole in the container and the pulley continues to rotate now it returns to its original position and the opening is closed. The infrared sensor also detects the presence of seeds, alerts us when there is no seed and the vehicle is switched off immediately. The robot runs only when there are seeds in the container. This is how the seeds are sown from time to time.

4.4 Workflow of proposed sensor based Agribot for sowing seeds

The workflow of the proposed seed-sized agribot includes the following steps:

Step 1: Soil moisture sensor checks soil moisture.

Step 2: Check the equal humidity to 40% or greater to 40%.

Step 3: After that the robot starts digging Process

Step 4: All prices are displayed

Step 5: The ultrasonic sensor directs the robot by looking at any obstacles.

Step 6: The infrared sensor is used to check the presence of seed in the container and is also used to sow seeds from time to time.

Step 7: All the functions of this automated robot are monitored using a web page connected using a Wi-Fi module.

Step 8: The robot stops working when the seeds are sown from time to time.

5. RESULTS

This automated robot is used to sow seeds from time to time. This is mainly to make the job easier and more efficient. Thus it helps farmers to be more efficient. This robot can operate successfully on any soil. The robot navigates with the help of an engine mounted on the wheels, and the car runs with the help of adjustable batteries. This is an automated robot that can only be viewed using a web page. This robot is guided by an ultrasonic sensor that directs the robot through obstacles and the infrared sensor helps to sow seeds from time to time. The robot does not need to be controlled by an automated robot that is easy to use because it only needs to be monitored. It is practical and farmers can easily use this car. This robot focuses primarily on sowing seeds far and wide without direct contact with them.

6. CONCLUSION

The main focus of this program is its default method of sowing seeds. Seeds are sown in a sequence that should have the effect of proper germination. This method of sowing seeds using a robot reduces the need for workers. Here seed loss is also greatly reduced. This program is designed to sow seeds automatically. Here with the help of a robot the seeds are spread in the ground in the right order thus reducing the seed wastage The process of planting onion crops was only used using the Seed Sowing V robot independently. This robot will help farmers to make good farming practices.

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