Report on

AGROBOT

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Subject: Mini Project – 1B

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CERTIFICATE

This is to certify that following students

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We declare that this written submission represents our ideas in our own words and where others' ideas or words have been included, we have adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. We understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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Abstract

In this project, the robot system is used to develop the process of cultivating agricultural land without the use of man power. The aim of the project is to reduce the man power time and increase the Productivity rate of farmers. Robotic farmer or “Agro-bot” robot used for agricultural purposes. Here the designing systems like plough the land, sowing the seed or spraying the fertilizer and harvesting of crops are preferred by this autonomous robot Agriculture is the science and art of cultivating Plants. Agriculture was The key development in the Rise of sedentary human the civilization. Agriculture is done manually from ages, As the world is pacing towards the new technologies and implementations it is a necessary goal to trend up with agriculture also.

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Chapter 1

Introduction

In present scenario most countries are facing problems due to the old and conventional methods in agricultural sector and it affects the growth of developing countries .so it’s time to make some technological advancements in the sector to overcome this problem. In India, there are 70% people dependent on agriculture. So, we need to study the problems arising in agricultural methods. Innovative idea of our project is to automate the process of sowing crops. The farming system like ploughing All the processes are improvising the mechanism in farming which works automatically with very little man power requirement. The small machine would be assembled from existing mass-produced components without the need of changing the existing design. Agriculture is mainly a generous practice of cultivating soil in order to grow crops and a variety of other things.as India is world famous known as the land of farmers because most of the coun try's citizens are mainly involved in agricultural production. Agriculture has lesser companions than other fields. Humans as well as natural calamities, have wreaked on the world's changing agriculture and farming processes. Changes in the climate have a greater impact on agriculture production, which is growing so agriculture is decreasing. At the same time, agriculture technology is evolving rapidly, with the help of automation in the field, to elivate the difficulties faced by farmers. The use of robotics in agriculture, such as ploughing, seed and harvesting, will bring forward in our conventional life style. This, in turn, gives better results in terms of productivity by increasing the rate of productivity .In India, the

traditional method of dragging, lifting, weed control, and fruit picking relies on manual labor. Farmers are currently not having better results due to the lack of use of robots in agricultural operations. These methods must be instilled in farming. Farmers are subjected to adverse environmental conditions when spraying chemicals and pesticides in agriculture. Tractors compact the soil in the fields because they are strong, caged, and unable to move in difficult usage This robotics will solve a lot of issues in the land. Robots can operate in any condition, regardless of the weather, according to a program that instructs them to perform the necessary exercise with the aid of computerization. The main benefit of the robots is that they are light in weight and do not compact the soil in the field.

Chapter 2

Litreture survey

Designing an Autonomous Soil Monitoring Robot (IEEE - 2015) Patrick M. Piper and Jacob S. Vogel etal

In this research they designed an autonomous soil monitoring rover to accelerate the process of data collection. The rover will be able to autonomously navigate through a field and avoid obstacles reviewed that lack of man power has resulted in spending a lot of money in seed sowing, is not only time consuming but also not accurate. The basic objective of sowing operation is to put the seed and fertilizer in rows at selected depth and spacing, cover the seeds with soil and provide proper compaction over the seed. The recommended row to row spacing, seed rate, seed to seed spacing and depth of seed placement vary from crop to crop and according to different agricultural and climatic conditions to achieve optimum yields and an efficient sowing machine should attempt to fulfil these requirements. Stated that the seed sowing machine is a key component of agriculture field. High precision pneumatic planters have been developed for many varieties of crops, for a range of seed sizes, resulting to uniform seeds distribution along the travel path in seed spacing. Revealed that by using a seed drill for wheat crop there was an increase in yield by 13.025 percent in comparison to the conventional method, it also revealed that by using a seed drill for wheat crop, a saving of 69.96 per cent in man-hours and 55.17 percent in hillock hours was achieved when compared, with the conventional method.[1]

Oil testing is essential for modern agriculture: Shah Alamgir; Israt Jahan

In this paper to optimize the production, protect the environment from fertilizers overuse, save money and energy during the production. The purpose

of this work was to develop an autonomous mobile platform with soil sampling device for agriculture. Soil samples are analysed to determine the composition, charac-teristics or nutrient levels of the soil. Smallholder farmers can use simple hand-held field-testing kits. However, in the case of large farms where plants are grown upon hundreds of hectares, the autonomous mobile platform with a soil sampler would be the optimal solution. Precision farming is a concept of using new production and management methods that use all kind of data collected about specific locations and crop variety. The mentioned robot can increase resource and cost efficiency in acquiring the required data. Information about the soil properties can be retrieved from the field using the robot's onboard systems, enabling farmers to respond to abrupt changes in real time. Data technologies and collecting soil system allows an efficient production process. Use of robots on farms is associated with the progressive digitisation of all areas of our lives, and agriculture is no exception.[2]

August 2015 doi:10.1109/icinfa.2015.7279423 conference: 2015 ieee international conference on information and automation (icia) Qingchun Feng ; Xiaonan Wang .

In order to improve robotic harvesting for fresh tomato and reduce the amount of human labor, this paper designed a tomato intelligent picking robot. The picking robot included the vision positioning unit, the picking gripper, the control system and carrying platform. Based on the working principle of each component, the working process of picking robot was revised. Based on his color model for image segmentation, the recognition accuracy was improved. The sacs filled with constant pressure air were adopted as the grasping component of the picking end-effector, to prevent the fruits from being damaged. The performance test of picking robot indicated that vision positioning module and the gripper module ran well. The execution time of a single harvest cycle was about 24s, and the success rate for harvesting tomatoes was 83.9 percent.[3]

Chapter 3

Problem definition

Robotics is the branch of technology that deals with the design, construction, operation, and application of robots. A most of the equipment needed cannot be purchased locally and import is unavoidable so cost is increases. More manual power is required. Wastage of Resource Due to improper nurishment of plants productivity decreases. Insufficient availability of fuel, spare parts, fertilizer and chemicals/reagents. More manual power is required. Wastage of Resources. Concerns over the production of good quality & quantity has been always raised in recent years. The exponentially growing human population, with lesser agriculture resources, made us seek new ways to improve agriculture efficiency. This problem can be solved efficiently using robotics, this in turn has increased the interest and spending, in Agriculture Robotics

Chapter 4

Proposed approach

We have developed a portable automate irrigation robot system that performs the tasks of the farmers such as sowing the seeds, flattening the land, spraying water.DHT-11 an temperature and humidity sensor collects temperature and humidity of soil. An Aurdino ATMEGA module transmittes the collected data from sensors to the to the mobile application. An Bluetooth module controls the direction of bot. Servo motor controls the motion of bot and with the help of shield efficient power management is achieved. Bot simultaneously plough the land and distributes the seeds. Bluetooth HC-05 is connected to the motor driver L293D and able to receive the signal from the application in the digital.

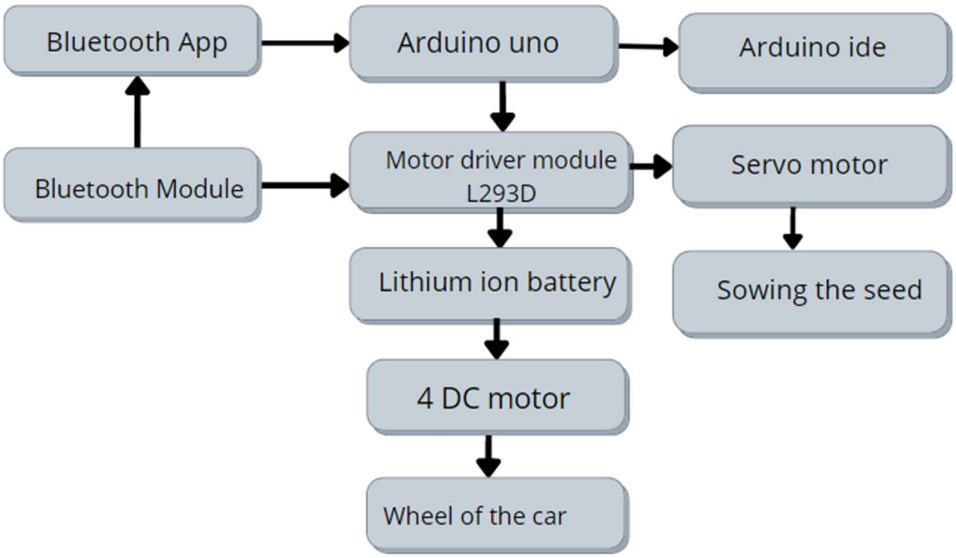

Fig.4.1 flow chart diagram

Chapter 5

Implementation

Fig.5.1 Mobile app

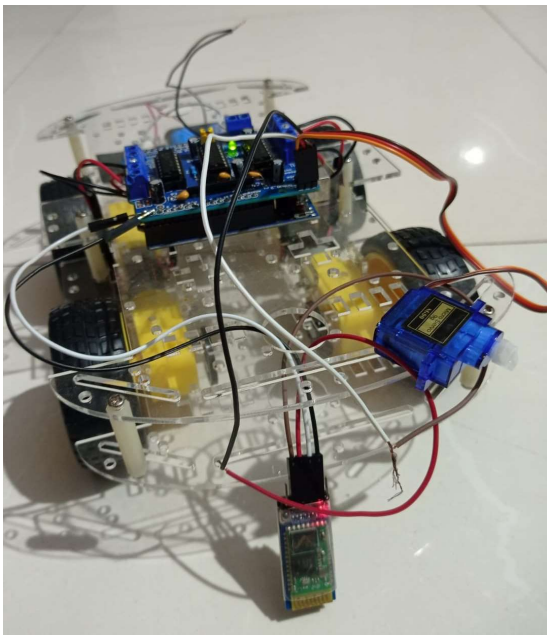

Fig.5.2 Output Bluetooth receive signal

5.1 COMPONENT REQUIRED

5.1.1 Arduino uno

is a low-cost, flexible, and easy-to-use programmable open-source microcontroller board that can be integrated into a variety of electronic projects. This board can be interfaced with other Arduino boards, Arduino shields, Raspberry Pi boards and can control relays, LEDs, servos, and motors as an output. Arduino UNO features AVR microcontroller Atmega328, 6 analogue input pins, and 14 digital I/O pins out of which 6 PWM.

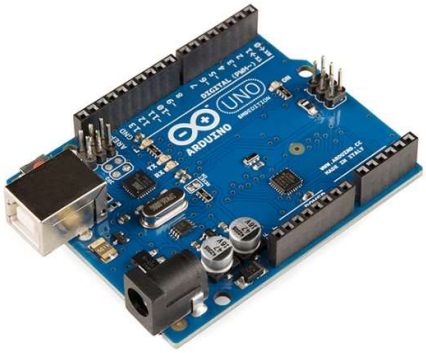

Fig.5.3 Arduino uno

This board contains a USB interface i.e. USB cable is used to connect the board with the computer and Arduino IDE (Integrated Development Environment) software is used to program the board.

The unit comes with 32KB flash memory that is used to store the number of instructions while the SRAM is 2KB and EEPROM is 1KB.

The operating voltage of the unit is 5V which projects the microcontroller on the board and its associated circuitry operates at 5V while the input voltage ranges between 6V to 20V and the recommended input voltage ranges from 7V to 12V

5.1.2 L293D Motor Driver:

Fig.5.4 L293D Motor Driver

H bridge is an electronic circuit that allows a voltage to be applied across a load in any direction. H-bridge circuits are frequently used in robotics and many other applications to allow DC motors to run forward & backward. These motor control circuits are mostly used in different converters like DC-DC, DC-AC, AC-AC converters and many other types of power electronic converters. In specific, a bipolar stepper motor is always driven by a motor controller having two H-bridges. DC gear head motors need current above 250mA

5.1.3 4 WHEEL ROBOT CHASIS

Fig.5.5 4 WHEEL ROBOT CHASIS

This is double layer 4 wheel smart car robot chassis DIY kit. It comes with the four pairs of Geared Motors and Wheels. All the products included in this car kit are quality products. The chassis used in this kit is transparent so as to create dynamic handling of the components mounted on your robotic vehicle.

5.1.4 Switch

Fig.5.6 Switch

The Switch is the button that are used do On Off Means to put in the circuit to do on off.

5.1.5 Lithium ion Battary

Fig.5.7 Lithium ion Battary

Lithium-based batteries that have high round trip of efficiency it have high energy and also power density and it also have low self discharge rate and they have been widely to used in portable electronics. It can also have high power density and also make s lithium ion batteries on option for powering electrical vehicles.

5.1.6 Arduino IDE:

Fig.5.8 Arduino IDE

The open-source Arduino Software (IDE) makes it easy to write code and upload it to the board. This software can be used with any Arduino board. The Arduino Integrated Development Environment - or Arduino Software (IDE) - contains a text editor for writing code, a message area, a text console, a toolbar with buttons for common functions and a series of menus. It connects to the Arduino hardware to upload programs and communicate with them.

5.2 BLOCK DIGRAM

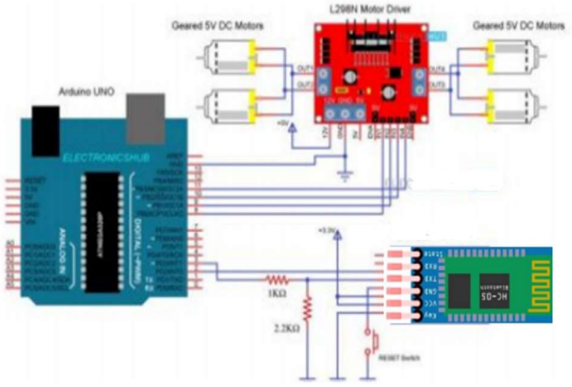

Fig.5.9 Block Diagram

Chapter 6

Result

Smart farming system monitors which can be operated by the mobile application, and farmer can use it for seed sowing in the land and able to find the temperature and soil moisture of the soli by the using sensors.

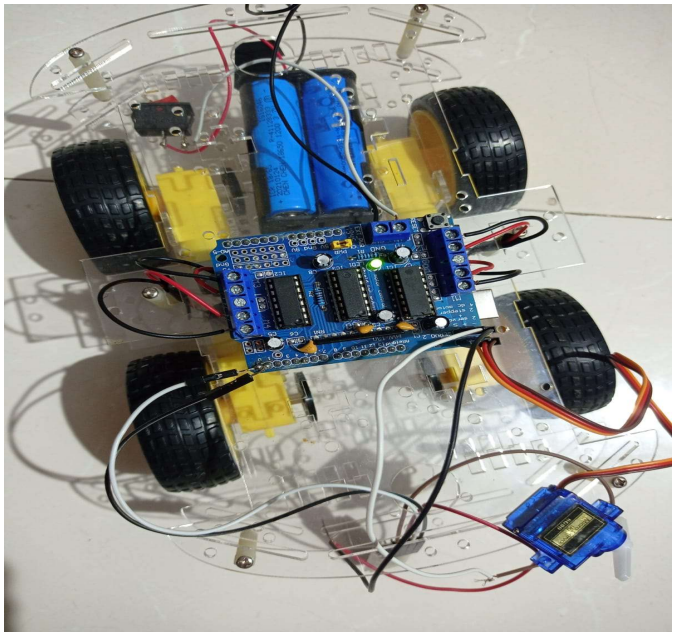

Fig.6.1 output

Chapter 7

Conclusion & Future scope

By the help this Agrobot they can save time. The system has high efficiency and accuracy . With the help of robot we are able to plough the farm and simultaneously seed distribution can be done. And its very eco-friendly to the farmar as we think about the price and many more parameter . The System has high efficiency and accuracy in fetching the live data of temperature and soil moisture.

Future work would be focused more on increasing sensors on this system to fetch more data especially with regard to Pest Control and by also integrating GPS module in this system to enhance this Agriculture IoT Technology to full-fledged Agriculture Precision ready product. We can make it as AI robot which is based on the training based automation.

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