

Bluetooth Embedded Robotic with Agriculture Ploughing, Seeding and Grass Cutting Powered by Solar Energy

Rafega Beham¹, Asha K², Sakthi Sridevi³, Manisha Samal⁴

¹ Sr. Assistant Professor , Information Science Engineering, New Horizon College of Engineering, Bangalore, Karnataka, India

^{2,3,4} Students of Information Science and Engineering, New Horizon College of Engineering, Bangalore, Karnataka, India

ABSTRACT

The primary goal of this paper is to lessen the work and power of the farmer. Agriculture is the principle profession in India. One-Third of population is dependent on agriculture directly or in a roundabout way. it isn't simply a supply of livelihood but a manner of lifestyles. It is the primary source of meals, fodder and gas. The agriculture gadget in India needs to be advanced to lessen the efforts of farmers. advanced farming technology involve diverse numbers of operations and are accomplished in the Agriculture discipline like seeding, waste plant cutting, ploughing and so forth. However the conventional methods of seeding, ploughing and plant cutting are not effective and it calls for man energy and value of work additionally increases primarily based on man energy and product. the device's used for seed sowing are very tough and inconvenient to address. so there's a want to increase system with the intention to reduce the efforts of farmers and boom its productiveness and decrease the operating cost. This gadget introduces a control Mechanism which is automatic in any such way that sowing the seeds as in line with the requirement of various seed to seed spacing and depth of seeds placements. in this proposed device seed wastage can be decreased. This unit is attached to the tractors to do automation and it uses sun electricity for its operation.

Keywords: Microcontroller (Renesas 64 Bit), Ultrasonic Sensor, L293, Four Wheels, Relay.

I. INTRODUCTION

In traditional Fashion of agriculture, each motion may be like manual paintings to be accomplished, like guide seed planting and results in low seed placement and with high value of man power and time. Current era will improve the seed planting and offers extra gain than traditional one. Present day fashion of agriculture includes so many machines for cultivating and seeding plant life, irrigation, ploughing, and many others. By way of the usage of robotic technology, seeding can finish the use of automatic robot motion and it could be monitored. Nowadays several generation and devices are invented for improving agricultural overall performance and boom efficiency of the crop

production. The use of conventional way of cultivation, there can be loss to the farmer of their crop cultivation and in crop management as well due to seeds wastage, crop loss for the duration of crop cultivation, hard work control and time management as properly. These global calls for the whole lot need to be done instantly and in greater powerful manner, because of this automation got here into lifestyles. Robotics technology plays a paramount role in all sections like medical discipline, industries and numerous businesses. In few nation's robots are used to carry out cultivation operations in the agricultural area. Now using those modern technologies, we are able to build operational gadget inside the farming device to reduce the efforts of farmers and also to reduce time, electricity and required value.

II. RELATED WORK

In [1] author studied the performance of seed sowing devices by using the use of photo processing Set of rules the use of MATLAB software program. This study gives the understanding at the impact of seed intensity; omit seeding ratio and overall performance seed sowing tool germination of seed and efficiency of yield crop. The paper specifically concentrates on comparison between traditional sowing approach and new proposed system that could carry out wide variety of simultaneous operation. This proposed gadget designed in this kind of manner that it achieves these operations; required row to row spacing, seed rate, seed to seed spacing and Fertilizers placement varies from crop to crop. This machine reduces the sowing time, human efforts and labour price.

In [2] creator studied that designed machine is to work on seeding, fertilizing and perform sports to analyse soil ph., temperature, moisture, humidity of soil. The robot is designed in one of this manner that it plays the above sports and navigated and monitored via managed remote which is connected thru internet connection.

In [3] writer studied a robot platform which operates with high speed of pastime for a sophisticated agriculture system which includes cultivation. The robot machine is an electromechanical (conveys a sense that it has enterprise of its own) and synthetic agent which is prompt with the aid of dc motor which has four wheels. The farm is cultivated by using the system, depending on the crop thinking about precise rows & specific columns. The infrared sensor detects the obstacles within the direction and it additionally navigates the car at turning function at stop of Land the use of sensor. The seed block may be detected and solved the use of water strain. The device can be controlled remotely and solar panel is used to fee dc battery. Microcontrollers are

programmed the usage of assembly language, this microcontrollers are used to manipulate and monitor the method of gadget movement of vehicle with the help of dc motor.

III. PROPOSED SYSTEM

The primary goal of this paper is to present agriculture operations like ploughing, seeding, waste plant reducing (grass). by using the Robot technology the farmer can operate and carry out the above operations via android utility with the aid of imparting the input to the device and it performs the operation in line with the enter supplied by using the farmer.

A. Ploughing

That is a farming device, used for loosening or turning the soil earlier than sowing seed or planting. Traditional technique of plough drawn with the aid of oxen and horses, however in modern-day way of farming are drawn by way of tractors. a plough may have a wooden, iron or steel body, with a blade Attached to cut and loosen the soil. The ones conventional approach ploughing includes heavy equipments, animals with human presence. That sort of plough may be very harmful to those animals. On this proposed device one tiller is used to plough the land. The use of this computerized system, farmer can plough the land without difficulty via providing commands to system.



Figure 1: ploughing

B. Seeding

Seed sowing's very basic and paramount operation in the agricultural discipline. Now an afternoon's seed sowing is carried out either manually or by means of Tractors. Manual approach consists of broadcasting the seeds by using hand. Some other method of seeding is dibbling i.e. making holes and dropping seeds by means of hand is used. And also pair of bullocks is used to carry the heavy system of levelling and seed dropping. Some other technique of seed sowing is to apply tractor in farms, this heavy system's has seed garage and losing mechanism are attached to it and it drop the seeds.



Figure 2: Seeding

A ground wheel is connected at the base of the seed sowing machine. The strength Transmission machine is used to transmit the movement of the rotation to the metering mechanism. the metering mechanism contains variety of scoops to drop out the seeds from the hopper. The seeds are then transmitted inside the seed distributor pipes. Bendy and compatible pipes may be used to distribute seeds. With the assist of tiller we can make the land clean for sowing the seeds.

C. Grass cutting

Grass cutting or crop cutting is an essential activity in farming, i.e. reducing of grass or waste plant or crop conventional manner of grass reducing is accomplished by using hand the use of various cutter equipment. Now a day's, grass cutters are using for this reason. Grass cutter makes use of a solar

irradiance as a primary strength supply with the presence of a solar panel. This grass cutter prototype is developed to reduce air pollutant and enhance the contemporary design in particular the blade position based totally at the preceding research. from the time immemorial, the sun is the main source of energy for lifestyles on Earth used for warmth and lighting. In recent times, solar energy has been referred to as a renewable power supply. Its miles an alternative electricity to that of fossil gasoline and it may be amassed from the renewable assets along with sun, wind and hydro. with cutting-edge era, this new prototype is designed as remotely controlled grass cutter using Arduino Uno. Farmer makes use of smart phones for controlling the gadget via the utility to reduce the waste plants or grass without problems without using heavy gadget's and Human presence.



Figure 3: Grass cutting

BLOCK DIAGRAM

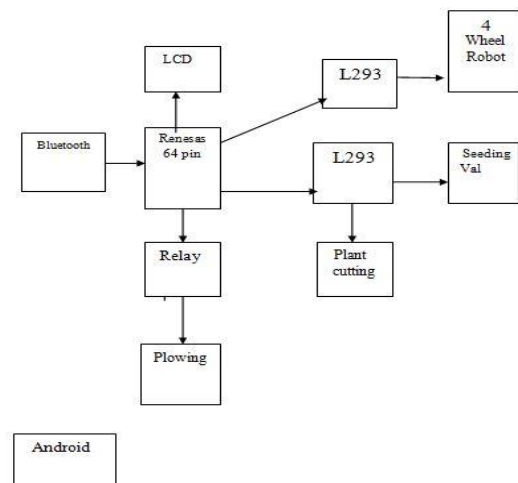


Figure 4: System Architecture

Bluetooth: it is a Wi-Fi era widespread used for changing statistics among fixed and mobile gadgets over short distances using brief wavelength uhf radio waves in the industrial, medical and clinical radio bands, from 2.402 GHz to two.480 GHz, and constructing personal region networks (pans).



Figure 5: Bluetooth Module

Ultrasonic: ranging module hc-05 represents 2cm-400cm non-touch measurement feature, the ranging Accuracy can reach to 3mm. the modules consists of ultrasonic transmitters, receiver and control circuit.

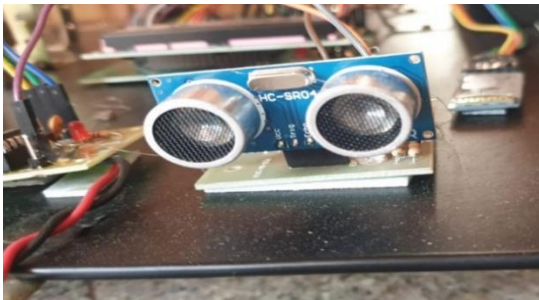


Figure 6: Ultrasonic Sensor

Microcontroller: we're using Renesas 64-bit microcontroller. the microcontroller has 3 sections like power segment, communication segment, controller phase.



Figure 7: Renesas Microcontroller

Liquid crystal display: (liquid crystal show) used to visualize the complete process on the LCD display. this linked to the microcontroller which has a 16Pins (1x16).



Figure 8: LCD display

A relay is an electrically operated transfer. relay creates a magnetic discipline which draws a lever and modifications the switch contacts. the coil modern-day may be on or off so relays have two transfer positions and most have double throw (changeover) transfer contacts. Relays permit one circuit to exchange a 2d circuit which may be completely separate from the primary. Usually used relays are typically spdt or dpdt however they can have many greater units of transfer contacts, for Example relays with 4 sets of changeover contacts are easily to be had.

IV. FLOWCHART

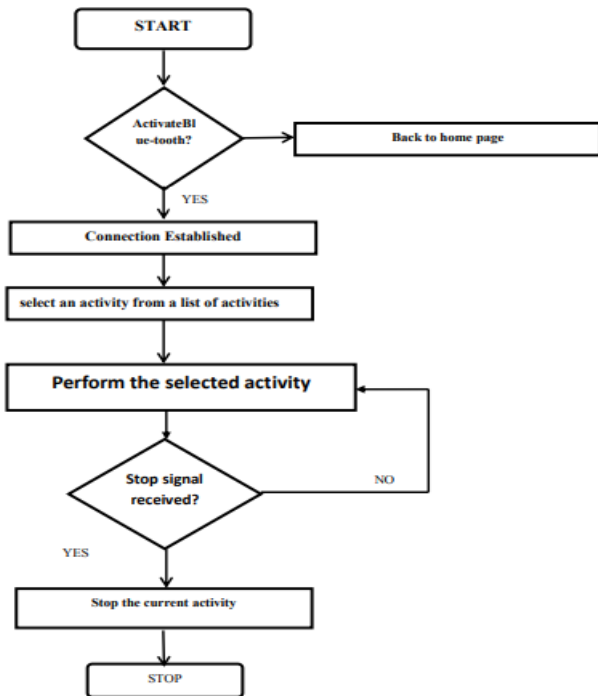


Figure 9: Flowchart

As shown in below determine: first of all when the robotic system started, it'll checks all its operations and get equipped to carry out the commands supplied by user. whilst the person gives input command to the robotic through deciding on the operations like ploughing, seeding, grass reducing. gadget receives the input via linked Bluetooth community from android software and this enter is sent to microcontroller and microcontroller will method this input command and perform the chosen operations and operation might be stopped as soon as operation is finished. Bluetooth is used to speak with robot thru android and ship the operation to the microcontroller. as per the recommendations given by the farmer the robotic circulate in, forward, flip round, left and proper bearing to drop the seeds at a selected function. 4 wheels are associated at the base for the adaptable improvement of robotic. dc engines are applied to drive the wheels associated with the robotic. 1293d is utilized to power the dc engines.

V. WORKING

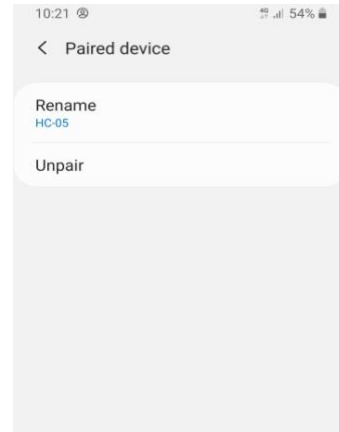


Figure 10: Pairing device

The person to begin with pairs the Bluetooth tool to open the utility, could be displayed as proven in above figure. the device name is hc-05. person cannot login to software without pairing the device.

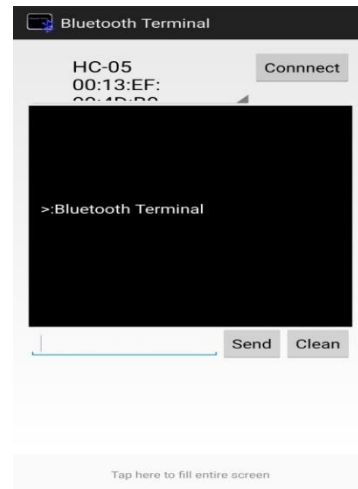


Figure 11: Bluetooth terminal utility

As shown in above determine there's an software Bluetooth terminal, this utility is used to send input to the robot device by means of selecting the operations like ploughing, seeding, and grass reducing and we are able to give cycles and steps as enter to the robotic device.

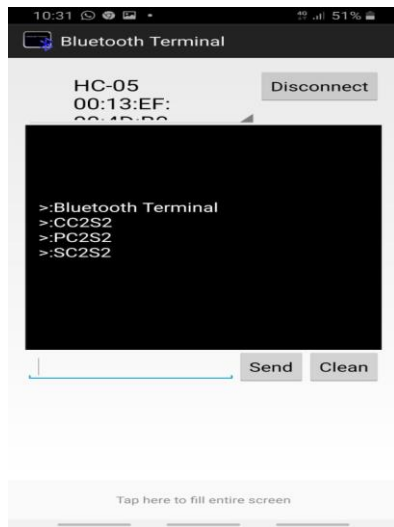


Figure 12: Inputs given

As shown in above figure the tool is connected to device. this tool is operated by using giving inputs. once the consumer offers enter to the device, person need to click on 'send' button to run the operation.

Simulation running procedure

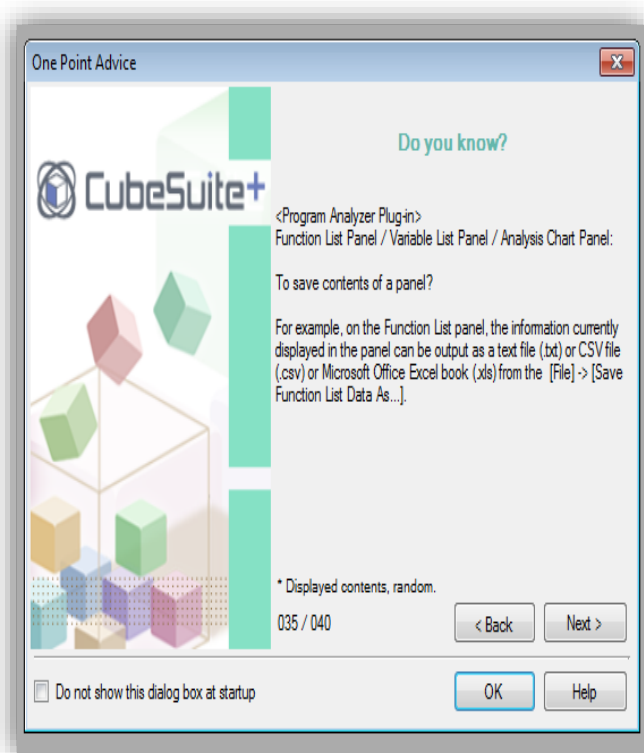


Figure 13: Cube suite+ web page

As proven in above Figure the simulation is accomplished the use of the cube suite+.



Figure 14: Flash programmer using Renesas flash programmer- choose emulator

As shown in above determine this is the very last step of simulation. click on begin for the simulation system to complete.

VI. RESULT & DISCUSSION

Agricultural robot gets the input from the utility, those inputs are received using Bluetooth module plays all the sports decided on by way of the Person. Consequences of each module of agricultural robot

1) **Grass cutting:** dc motor is connected with blades to reduce the grass successfully. (as shown in Figure.15)

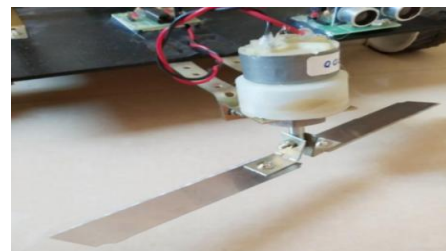


Figure 15: Grass Cutting

2) **Ploughing:** the plough arm made of screws moves down and plows the soil and is lifted up after completion of plowing (as shown in Figure.16)

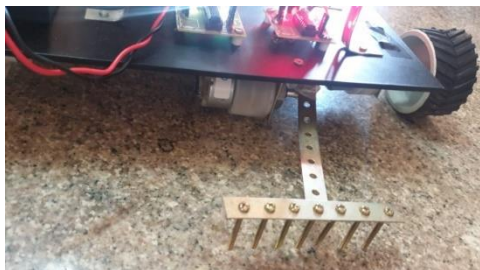


Figure 16: Ploughing

3) **Seeding:** seeds are dropped from the funnel the usage of the open-near movement of valves at identical periods (as shown in Figure.17)

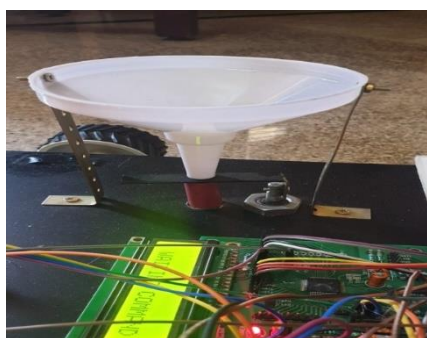


Figure 17: Seeding

4) Agricultural robot with all its modules assembled together seems like the following photographs.



Figure 18: Agri-robot

VII. CONCLUSION

Technology is coming across or creating major breakthrough in diverse fields, and hence generation keeps updating. This task is designed using dependent modelling and capable of offer the desired consequences. It can be efficiently carried out as a real time system with positive Modifications. This makes the present system extra effective. If we're the usage of this machine for actual time reason, this desires to be implemented with more range of additives and by means of contemporary technologies.

VIII. REFERENCES

- [1]. Shivprasad b s, ravishankara m n, b n shoba "layout and implementation of seeding and fertilizing agriculture robot." global magazine of Software or innovation in engineering & control (ijaiem), volume3, issue6, june 2014. R. caves, multinational employer and financial evaluation, cambridge university press, cambridge, 1982. (e-book style
- [2]. Ms. Gaganpreet Kaur, Anushka Upadhyay, Akash Srivastava, Abhishek Yagnik, Abhishek Bhardwaj Sun oriented Controlled Seeding and Furrowing Robot-An Audit - IJRAER.2017
- [3]. Abdulrahman, Mangesh Koli, Umesh Kori, Ahmadakbar Division of MECHANICAL and Building Theem School of Designing Seed Planting Robot Universal Diary of MECHANICAL Patterns and Innovation (IJMET) – Volume 5 Issue 2, Blemish – Apr 2017.
- [4]. Nitin P. V., Shivprakash,"Multipurpose Rural Robot", Global Diary Of Designing Exploration Vol.5, Issue, 06, PP:1129-1254, 20 May 2016.

Cite this article as :

Rafega Beham, Asha K, Sakthi Sridevi, Manisha Samal, "Bluetooth Embedded Robotic with Agriculture Ploughing, Seeding and Grass Cutting Powered by Solar Energy", International Journal of Scientific Research in Computer Science, Engineering and Information Technology (IJSRCSEIT), ISSN : 2456-3307, Volume 6, Issue 3, pp.477-483, May-June-2020. Available at doi : <https://doi.org/10.32628/CSEIT2063120>
Journal URL : <http://ijsrcseit.com/CSEIT2063120>