"Design and operation of agriculture Based pesticide spraying and Grass Cutting Robot"

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Abstract: In this design the source energy is ambitious from the sun radiation by using PV panels and it is stored in 12V rechargeable DC battery. The proposed proto-vehicle performs two operations that are controlled using a switch. The first operation is grass cutting, the grass cutting blade is connected a DC Motor. The second operation is the spreading of water/pesticide, here we use a water pump connected to the spreading nozzle by the means ofhoses. The battery is connected to the RF Module with controls all the motors.

The RF session encompasses an RF transmission and reception. This Tx/Rx pair (RF module) functions at a frequency of 434 MHz. The data required for the RF transmitter is received from series of serial data and is transmitted in wireless manner using the RF antenna. The data that is transmitted is received by RF receiver in the RF module with same operating frequency of transmitter. The RF module has a pair of encoder/decoder and is used with the module itself. The encoder encodes the parallel data for the transmission system and the at the reception decoder unit is used for decoding the data. Input signals are transmitted throughfour channels and the outputs are observed with a set of four LED's with respect to corresponding switches

I. INTRODUCTION

Robotic technology has increased appreciably in past couple of years. Such innovations were only a dream for some people a couple of years back. But in this rapid moving world, now there is a need of robot such as "*pesticide spraying and Grass CuttingRobot*" that can interact and co-exist with them. The development of robot technology hadincreased significantly due to agriculture and home appliances. In various fields with hot environment such as , agri,garden, big lawns etc.

Farmers have to work under primitive protection, high temperature and humidity and poor ventilation condition for a long time. Compared to developed countries particularly Japan, the averase age of grochhouse manager is more than 65 years old. Japanese greenhouse management has reached a high degree of automation and has been developing toa fully automated, unmanned direction.

They have established the most advanced level of greenhouse production model in the world, called "plant factory". The cultivation is conducted by robots or robotic arms, so it is completely free from the binding of natural conditions.

Therefore, it is urgent to improve our green house production equipment automation level and develop agricultural technique equipment to meet the requirements of the new era Nowadays smart phones are becoming more powerful with reinforced processors. largerstorage capackies, richer entertainment function and more communication methods.

Wi-Fitechnology add new features to smart phones It has changed how people use digital device athome or office, and has transferred traditional wired digital devices into wireless devices.Using a Smartphone as the brain of a robot is already an active research field with severalopen opportunities and promising possibilities.

In this paper we present a review ol currentrobots controlled by mobile phone. In our work. move the robot toward backward, left andright side by the android application

II.   METHODOLOGY
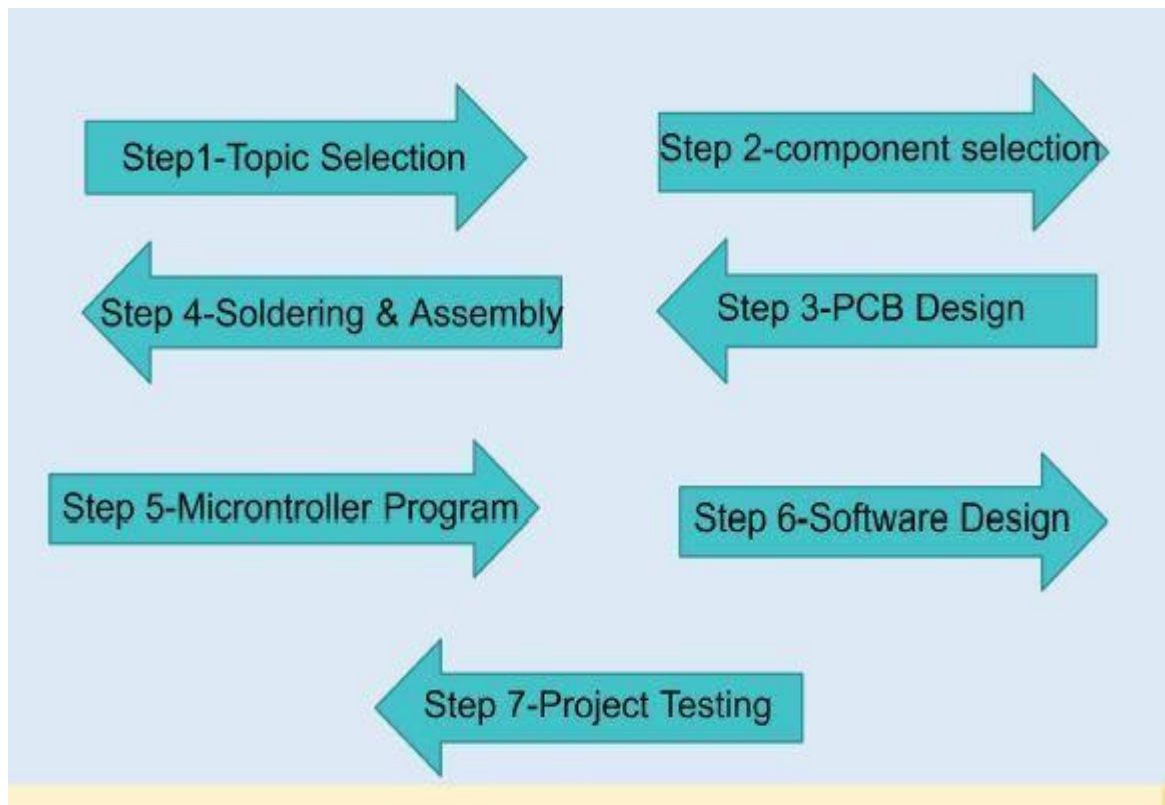
Here the design has a DC motors, battery, and microcontroller. The components are incorporated into a microcontroller. The ultrasonic sensor transmits the signal to detect the objects. If any echo signal is received that information goes to the microcontroller that controls the movement of the DC motors.

In the case of no object detected by the sensors thegrass cutter move until it finds the object in front that shows by glowing LED light. When it finds the object changes the path based on the preferences. The cutter motor is connected to the battery and the microcontroller and it works uninterruptedly to cut the grass consistently. Level of grass cutting is approximate 3 inch

The Machine Is Moving On The Right Side Due To Obstacle Detection On The Left Side. Figure 6 shows an automated machine equipped with ultrasonic sensors. When the machine ismoving in the forward direction if the left side of the ultrasonic sensor detects the object the vehicle turns to the right side. The switches S1, S2, S4 are opened and S3 is closed also making the relay pin low. Here S1, S2, S3, S4 are the switches that are internally present in the motor driver IC.

Hardware:
The grass cutter is suitable to be used for small application due to the shortest operating time,but it is not suitable for tall height grasses. This model is more suitable for a common man asit is having much more advantages i.e. no fuel cost, no pollution and lot more. Based on datacollected from research papers, we made a few changes to make our design better.

The cost effectiveness and the ease provided makes the proto-vehicle to be a necessity insteadof a luxury For future work, there are few recommendations can be made to develop a better device. Instead of using polycrystalline solar panel, it is better to used mono-crystalline solar panel due to the high efficiency.

The motor for the blade should have both high speed and torque. Higher capacity of rechargeable battery can lead to more operating time, in future we can implement lawn cutter by making arrangement to collect the grass that is cut off in order to reduce further manpower.
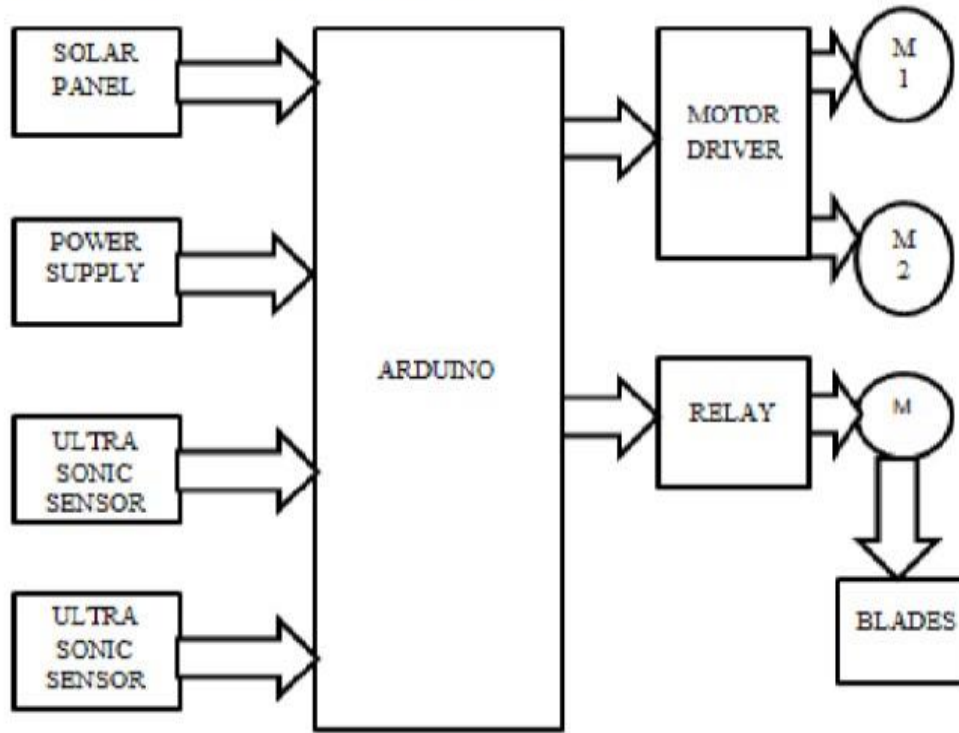
Block Diagram

Fig 1: Functional block diagram

The source is determined commencing from solar energy using a solar panel that energizes the battery and makes use of for driving the process of the system. The microcontroller controls the entire system.

A 40 kHz ultrasonic sensor, microcontrollers are used to automated the system. These are helpful for object detection. DC motors are used for wheel movement and cutting operations. An L298 driver circuit is used to achieve the compatibility of motors and the microcontrollers.

Here, the output of the microcontroller enhances by using the driver circuit. The cutting action of the blade is delivered by a motor of 1000rpm. The previous technological know-how of grass slicing is hand-operated with the aid of the use of hand gadgets like cutters, scissors, these consequences in better human work, and abundant time necessary for accomplishing the work. Also in old techniques deficiency of uniformity of the remaining grasses.
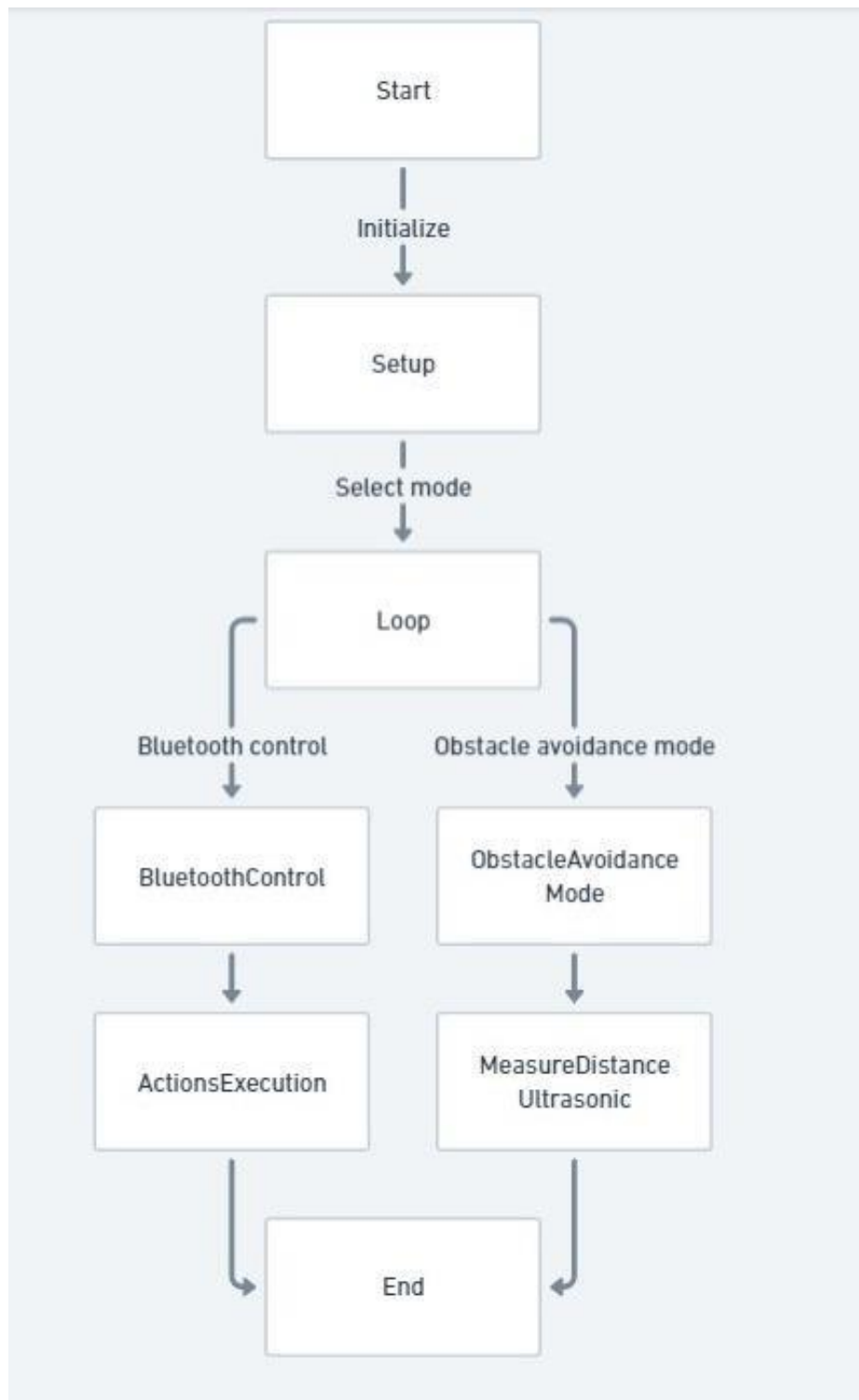
Software: Arduino IDE

Flowchart :

Fig 2: Flowchart

III. WORKING

Here the design has a solar panel, DC motors, battery, and microcontroller. The components are incorporated into a microcontroller. The ultrasonic sensor transmits the signal to detect the objects.

If any echo signal is received that information goes to the microcontroller that controls the movement of the DC motors. In the case of no object detected by the sensors the grass cutter move until it finds the object in front that shows by glowing LED light. When it finds the object changes the path based on the preferences.

Thecutter motor is connected to the battery and the microcontroller and it works uninterruptedly to cut the grass consistently. Level of grass cutting is approximate 3 inch

Fig 3: The Machine Is Moving On The Right Side Due To Obstacle Detection On TheLeft Side.

The Machine Is Moving On The Right Side Due To Obstacle Detection On The Left Side. Figure 6 shows an automated machine equipped with ultrasonic sensors.

When the machine ismoving in the forward direction if the left side of the ultrasonic sensor detects the object the vehicle turns to the right side. The switches S1, S2, S4 are opened and S3 is closed also making the relay pin low. Here S1, S2, S3, S4 are the switches that are internally present in the motor driver IC.

IV.   RESULTS

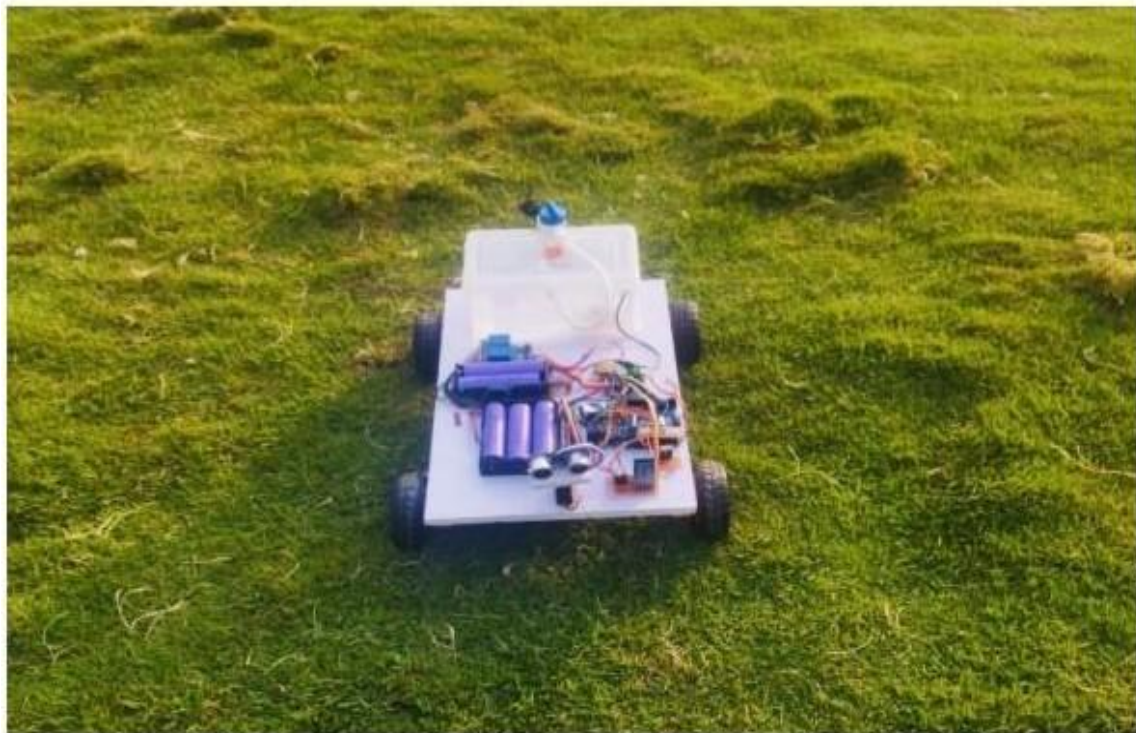Fig 4: Model of "Design and operation of agriculture Based pesticide spraying andGrass Cutting Robot"

Fig 5: Result For pesticide spraying and Grass Cutting

V. CONCLUSION

The main paper aim is suitable to be used for small application due to the shortest operating time, but it is not suitable for tall height grasses. This model is more suitable for a common man as it is having much more advantages i.e. no fuel cost, no pollution and lot more. Based on data collected from research papers, we made a few changes to make our design better.

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