

# Solar Powered Arduino Based Wireless Grass Cutter System

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**Abstract**— This paper gives the survey on the technique of wireless grass cutting through application. As we know the main objectives of solar powered wireless grass cutting are provide cutting of grass with solar energy. In this project we have automated machine for cutting the grass. This device consist of one blade which is operated with motor. In this project we use battery for operating the motor .The battery can be charge by using the Solar panel. For detecting the obstacles we use the Ultrasonic sensor. If any obstacle is in path then the ultrasonic sensor detect the obstacle and changes its direction and move forward for cutting the grass.  
**Key words:** Solar Panel, Blade, Ultrasonic Detector, Bluetooth Module

arrangement at an angle of degrees in such a way that it can receive solar radiation with high intensity from the sun. This electrical energy is stored in the batteries by using the solar charger. The main function of solar charger is to increase the current from the panels while the battery is charging. It also disconnects the solar panels from the batteries when they are fully charged and also connects to the panel when the charging of batteries is low. The motor is connected through the motor driver ICL293D which is controlled the motor performance. The power transmit to the mechanism and this makes the blade to rotate with high speed and cut the grass at a particular height. The cutter and motor are controlled by arduino MEGA2560.It move the robot by the application via android phone.

## I. INTRODUCTION

In this project we are doing the wireless grass cutting through robot. This project is useful for farmers as well as for preparing the play ground.Solar powered arduino based grass cutting system is fully automated grass cutting robot powered by solar energy which avoids the obstacles by ultrasonic sensors and which is able to to operate without human being. The system uses 5V battery to move the robot and operate grass cutter motor. We use the solar panel to charge the battery so that there is no need of charging it externally. The grass cutter and robot motors are interfaced with arduino AT MEGA 2560 that controls the working of the all motors. The ultrasonic sensor is also interfaced for detecting the obstacles. If any obstacle is come then we can operate the robot by our android .That means we can change the directions of the robot by the application.



Fig. 2: ARDUINO MEGA 2560

Arduino is an open-source hardware and software company, project and user community that designs and manufactures single-board microcontrollers and microcontroller kits for building digital devices and interactive objects that can sense and control both physically and digitally.

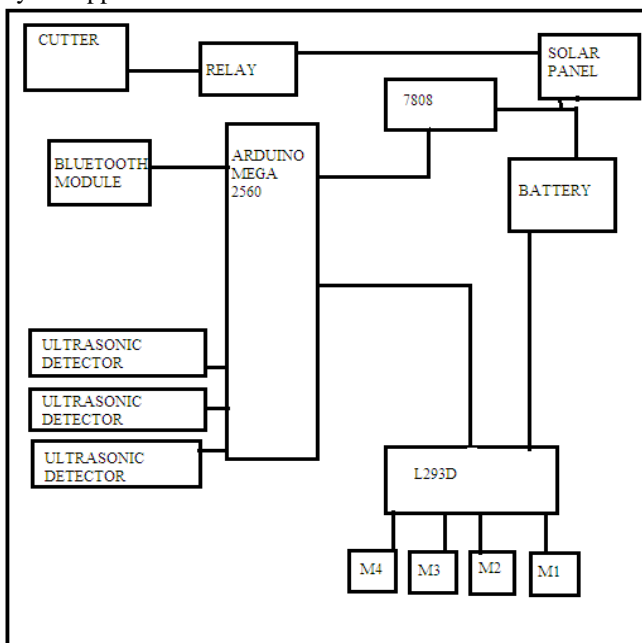


Fig. 1: Block Diagram

The solar powered arduino based wireless grass cutter system .It has panels mounted in a particular



Fig. 3: Driver Circuit

L293D is the most generally used driver for bidirectional motor energetic applications. L293D is a 16 pin motor driver IC which is use to drive the two motors. L293D

IC is a dual H-bridge motor driver. It can be used to drive direct current on any direction. It is used as a current speaker since it takes low current control signal as the input and provides high current signal as output. L293D IC can be used to drive undersized as well as big motors as well. L293D motor driver is available for providing user with ease and user responsive interfacing for embedded applications. It is simply compatible with any of the systems. In fig1 we can see that, it supports external power supply pins for motors.

## II. FLOW CHART

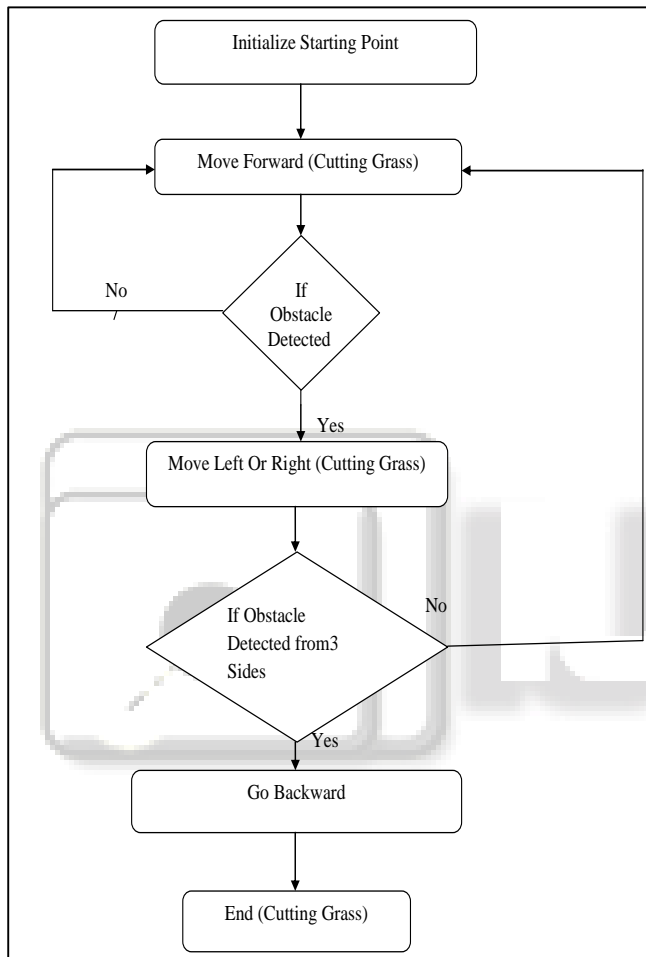


Fig. 4: Flowchart of Solar based Grass Cutter

## III. ALGORITHM

- 1) Initialize Starting Point.
- 2) Move the robot forward by pressing the switch so that it cuts the Grass.
- 3) If any obstacle is detected in path then robot turns towards left or right and cut the grass.
- 4) If any obstacle is not detected then go back to step no.2.
- 5) From all the 3 directions any obstacle is detected then robot move backward and cut the grass.
- 6) If any object is not detected then go to step no.2.
- 7) End. (Cutting grass).

## IV. HARDWARE OF PROJECT

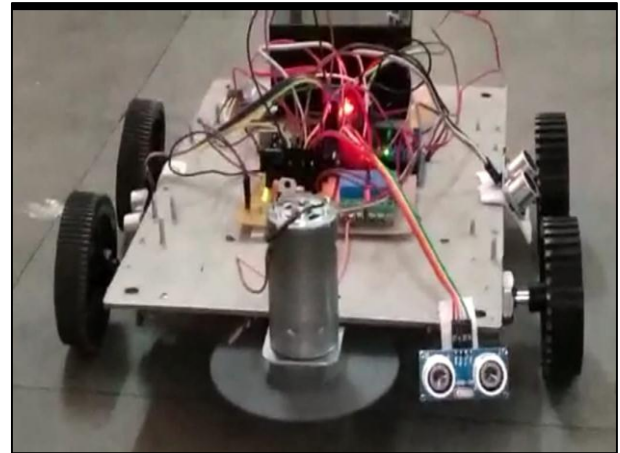


Fig. 4: Hardware of project

## V. RESULT & DISCUSSION

- It initialises the starting point for cutting grass.
- If any object detects in the path of left side then robotic vehicle changes its direction towards right side to cut the grass.
- If any object detects in the path of right side then robotic vehicle changes its direction towards left side to cut the grass.
- If objects detects from all 3 sides that is left side, right side and from front side then robotic vehicle moves backward to cut the grass.
- If no object detect then robotic vehicle move forward for cutting the grass.

## VI. CONCLUSION

It consumes renewable sources of energy so total energy received from sun far exceeds our energy demand. It meant to be an alternate green option to the popular and environment hazardous gas powered lawn mower and reduces human effort. Non skilled person also handle it easily and control within less time span.

It is efficient and accurate because it detects the obstacle and changes the direction or stop functioning as per the instruction given and cut the grass.

## VII. FUTURE SCOPE

The solar panel can be fixed with light sensors. Thus depending upon the arrangement of the sun, the panel will be slanting, such that the sun rays are incident normally to the solar panel. With this the device would be constant capable of trapping the solar energy at times when the strength of the sun light is less. If panel used of high watt, then the machine can be used during night time for garden lighting or room lighting, because we can accumulate more power.

Also we can use for the floor cleaning purpose using a broom by replacing the blade.

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