

# Fully Automated Solar Grass Cutter

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## ABSTRACT

The completely computerized solar based grass cutter is utilized for cutting the grass at various dimensions with no human intervention. The grass cutter is likewise equipped for evading any deterrents. The framework utilizes 12V batteries to control the vehicle motors along with the motor of the grass cutter. We also use a solar panel to charge the battery so that there is no need of charging it externally. The grass cutter and vehicle motors are interfaced to the ATMEGA family microcontroller that controls the working of the all the motors.

A standout amongst the most problems that are begging to be addressed with before renditions of grass cutting machines is that they were not robotized and constantly required the human support. This framework is utilized to conquer every one of the downsides of past frameworks like cutting grass on factor statures and notwithstanding cutting on inclines and subsequently gives a full verification grass cutting vehicle..

## I. INTRODUCTION

Due to the nonstop increment in the expense of the fuel, increasing pollution, an Earth-wide temperature boost, the need emerged for the utilization of solar power (which is accessible uninhibitedly and in a non-polluting way) as a wellspring of capacity to drive the Grass cutter. A Solar grass cutter is a machine that utilizes sliding sharp blades to cut the grass at an even length. Solar powered grass cutter is a valuable gadget which is simple in construction however gives successful outcomes. It is utilized to maintain lawns in schools, universities, and so on. We have executed changes in the current customary machine to make its application less demanding and at a decreased expense.

The automated solar grass/crop cutter is a robotic vehicle controlled by solar energy that likewise stays away from snags and is fit for grass cutting without the need of any human inclusion (despite the fact that there is additionally a choice to control it physically). The proposed undertaking is intended to be a substitute choice as opposed to the generally utilized yet naturally unsafe garden cutters. This plan is an endeavor to move from the conventional fuel based innovation to the cleverly controlled solar based energy.

## II. PROBLEM STATEMENT

The time where there is a merger of innovation and ecological mindfulness, every one of the customers are likewise investigating ways for utilizing most extreme efficient power vitality and contribute in decrease of their own carbon impressions. Contamination which has turned into an essential issue should be handled starting from the earliest stage itself. The innovation which was the reason for the natural corruption ought to be utilized to fix the earth. The solar based Grass cutter enables buyer in lessening the green house impact by decrease in the carbon discharge.

An overview had demonstrated that the Fuel controlled lawnmower are in 90% of the U.S.A homes and they make close about 5% of the complete U.S. contamination. Green innovation activities are being valued and upheld at the individual dimension corporate dimension and furthermore by the legislature. Our design is useful for the purchasers and condition to keep an enduring harmony among humankind and nature.

This venture will assist the buyers with cutting the grass in a proficient and eco friendly route by decreasing the carbon outflow and commotion contamination accordingly giving an advantageous option in contrast to the current frameworks.

### III. OBJECTIVES

The principle objectives of the project are to build up a basic and financial framework for cutting the grass at variable lengths. The proposed framework is intended to work in manual and auto mode relying upon the client's decision. The manual mode can be worked by the client with the assistance of Bluetooth wherein the client can control the gadget from his phone, though the gadget will work in a predefined design in the auto mode. The utilization of solar energy likewise frames one of the significant targets of the framework.

### IV. PROPOSED WORK

• BLOCK DIAGRAM

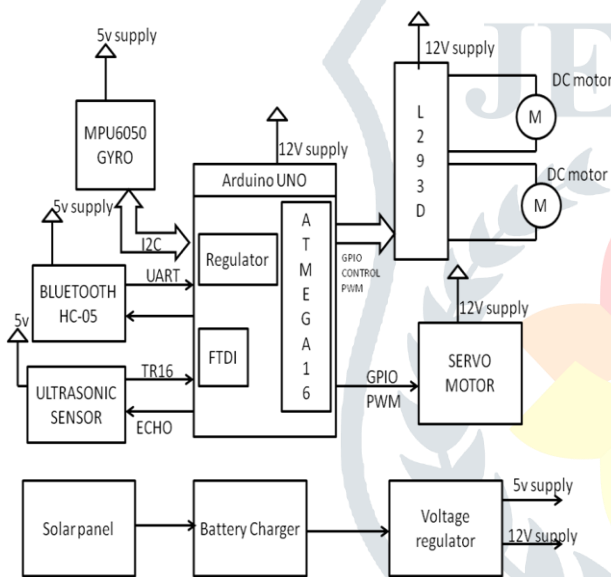


Fig 4.1 Block Diagram of Grass Cutter

• CIRCUIT DESIGN

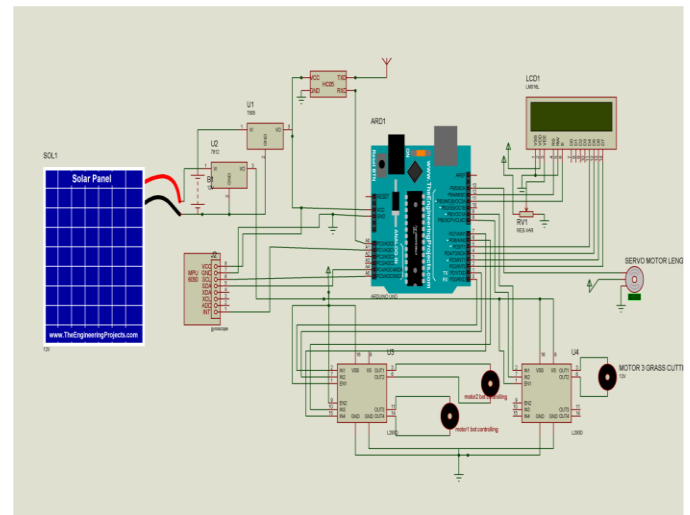


Fig 5.1 Circuit Design

The figure above shows the system architecture of the grass cutter.

- The Arduino uno Development board uses atmega16 microcontroller.
- The 12 DC supply is given to the Arduino board via DC connector.
- The ultrasonic sensor is connected to the microcontroller, which will transmit the data to the microcontroller about the trigger pulse and echo pulse.
- The Bluetooth module is connected to microcontroller using UART in order to receive commands from remote devices.
- MPU6050Gyro sensor is interfaced which uses i2c protocol which is used for slope detection.
- Various motors are used for functioning of robotic vehicle. The DC motors are connected to Arduino using L293D IC .
- Two motors are used to drive the motors the robotic vehicle, whereas the other two motors are used for the cutting operations.
- The servo motor is used for varying the length of the trimmer.
- The solar panel is connected to the battery.
- The solar panel is of 12V/7W, which charges the battery in approximately 8 hours.
- The Dc supply from the battery is given to the voltage regulator .

### V. EXPECTED RESULTS

- The automated solar grass cutter should be able to cut the grass at variable lengths ranging from 0.5 cm to 30 cm..
- The proposed system should receive commands from Bluetooth module ranging from 0 to 10 meters and work accordingly.
- The proposed system should work on solar energy having specification of 12V/7W.

### VI. CONCLUSION

Robotics is a quickly developing field which can utilize the innovation to lessen the human work. This grass Cutter will address the difficulty of minimal effort of activity since there is no expense for fuel. The machine is a conceivable swap for the fuel controlled grass cutters. The principle point of this project is to make a solar powered automated mechanical grass trimmer framework which will trim the garden in various patterns with lesser human exertion. Advantage of this framework is, utilized parts are of minimal effort and a couple of more sensors can be added to make the framework progressively productive.

### VII. FUTURE SCOPE

- Size can be reduced to make it compact.
- Efficiency can be improved by increasing the battery capacity.
- More sensors can be incorporated for accurate results and improved automation.
- Programming can be enhanced to make the device perform different operations

### VIII. REFERENCES

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