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## Automatic Solar-Powered Grass Cutter

**Assistant Prof. Ms. Priya D. Ghate, Ms. Rutuja Mahadev Khatave\*\* Ms. Pornima Ramesh Patil\*\*  
Ms. Snehal Rahul Pujari\*\* Ms. Samruddhi Sukumar Magdum\*\***

Electronics & Telecommunications Engineering Department, Sharad Institute of Technology College of Engineering, Yadav, Ichalkarnji, India

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### ABSTRACT:

Now days we face the issues like pollutions, power cut problem etc. to guard the environment from the adverse effects of pollution, many nations worldwide have enacted legislation to manage various styles of pollution moreover on mitigate the adverse effects of pollution. To beat these issues, we've got considered the device, which may be performing its functions without causing any of those issues. So we've got thought of doing the project on cutting grass, this uses the renewable source of energy for its operation like solar power. This project aims at developing portable grass cutting device with renewable source solar, as there's power shortage. So we've got decided to form an automatic solar-powered grass cutting device. The proposed system design eliminates the human efforts in grass cutting field like lawn. The solar grass cutting machine could be a robotic vehicle and is capable of automated and manual grass cutting.

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### INTRODUCTION :

An automatic solar grass cutter may be a fully automated grass trimming robotic machine powered by sun energy. It ignores objects, and it can cut the grass with none human interconnection. Working rule of automatic solar grass cutter is that it's panels positioned in an exceedingly particular arrangement in only like that it can accept sun energy from the sun with high intensity easily. A solar battery is employed to charge the battery. So that there's no need of charging it externally. We are using 12 volt battery to power the vehicle movement motor yet because the grass cutter motor. The movement of machine is completely controlled by automatic mode with the assistance of 8051 family microcontrollers. 'Bluetooth controller' 'play store application runs this machine movement and direction through an android application. The instructions of operation are received over the Bluetooth for wireless and long-range communication with low-cost option for communication. The most target of this machine is to scale back human efforts.

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### II. LITERATURE SURVEY:

#### 1.Design and implementation of solar-powered grass cutter

A grass cutter machine is employed to cut the grass. Solar-powered grass cutter is incredibly useful device which easy to handle, and it's very simple in construction. It will be employed in lawns in garden, colleges, schools. The aim of the project is constructed a grass cutting machine system which makes the grass cutter based motor running through alternative energy. To charge the battery we use solar battery, so no must charge it externally.

#### 2.Design and Implementation of controlling the automated solar-powered grass cutter:

We control the momentum of automatic solar energy grass cutter by using mobile application. We connect the device to Bluetooth. Set of keywords are defined for momentum of grass cutter in specific way. When user presses the touch arrow buttons, the mobile application will recognize that keywords and a sign is shipped to the Microcontroller. There are seven values like Forward, Backward, Left, Right, Stop, OFF and ON for every function of grass cutter. If the received data by the applying is lies between the required values then corresponding decision are going to be taken. This decision are sending to microcontroller to know the keyword then it'll send a symptom to maneuver the automated solar-powered grass cutter.

#### 3.Design and Modeling of Automatic Solar powered grass cutter:

This paper is discussed on a way to develop a solar energy grass cutter with several functions. Its objective is build grass cutter which don't leave any uncut area and don't go outside of workspace. Most important is automatic alternative energy grass cutter must be cheap and affordable to everyone. Basically It used the microcontroller to perform the grass cutter working.

## PROPOSED WORK:

- An Automated solar grass cutter may be a fully automated grass trimming robotic machine powered by sun energy. It ignores objects, and it can cut the grass with none human interconnection.
- The system uses 12V batteries to power the vehicle movement motors still because the grass cutter motor. We also use a solar battery to charge the battery, so there's no need of charging it externally.
- The grass cutter and vehicle motors are interfaced to a 8051family microcontroller that controls the working of all the motors. • The instructions operation are going to be received over the Bluetooth for wireless and long-range communication with low-cost option for communication.

## IV.COMPONENTS:

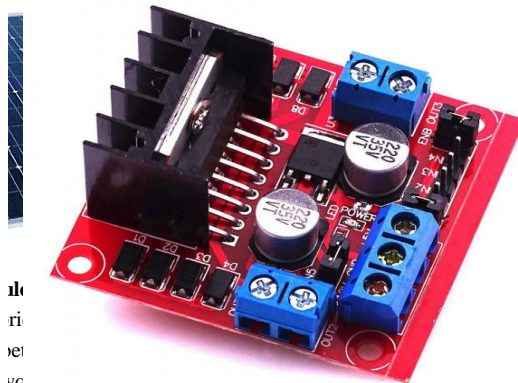
### Bluetooth Module HC-05:

The HC-05 Bluetooth module is intended for private wireless serial connectivity and employed in a Master or Slave configuration, providing it with a superb solution for wireless communication. This port Bluetooth module is fully adequate Bluetooth V2.0 + EDR 3 Mbps Modulation with 2.4 GHz radio transceiver and baseband. It contains total six pins; ENABLE pin to toggle within AT and Data command mode, VCC pin for giving voltage, Ground pin, TX-Transmitter and RX-receiver for sending and receiving serial data and lastly, a State pin for checking of Bluetooth pairing/unpairing). Its operating voltage is 3.3–5V and transmitting range is up to 90 m.



### Solar Panel:

A photovoltaic cell panel, solar electric panel, photo-voltaic (PV) module or simply solar battery is an assembly of photo-voltaic cells mounted during a framework for installation. Solar panels use sunlight as a source of energy to come up with electrical energy electricity. A group of PV modules is termed a PV panel and a system of PV panels is termed an array.



voltage is up to 12V.

### Microcontroller:

8051 microcontroller is meant by Intel in 1981. It's an 8-bit microcontroller. It's built with 40 pins DIP (dual inline package), 4kb of ROM storage and 128 bytes of RAM storage, 2 16-bit timers. consists of are four parallel 8-bit ports, which are programmable additionally as addressable as per the necessity. An on-chip quartz oscillator is integrated within the microcontroller having crystal frequency of 12 MHz.

speed of 1 or two DC (direct currents) motors of up to 2A current  
 gnal from the microcontroller and 4 output pins for the connection  
 's a built-in 5V regulator which is removed when the availability

**Geared DC Motor with Encoder / Simple DC Motor:**

An encoder provides an electrical signal that's wont to control speed and position. It turns the mechanical signal into an electrical which is managed by the system to manage special parameters of the appliance and make corrections if necessary. These parameters are defined by the sort of application, which has RPM, distance, speed, position between others. Cylindrical geared motor have six pins; Encoder A phase and B phase, Motor power supply Negative and Passive, Encoder power supply Negative and Passive. A straightforward DC motor converts power into mechanical and have four basic types that are series-wound, shunt-wound, compound-wound, and static magnet motors. A DC motor contains an armature, a stator, a rotor and a commutator with brushes. The other polarity within the 2 magnetic fields of the motor causes it to run. DC motor is that the commonest sort of motor utilized in many household appliances, like cooling fans and shaving machines, etc. it's only two wires; one for 12V VCC and also the other one is for grounding.

**DC Battery:**

A battery transforms chemical energy into electrically a chemical reaction that is kept inside the battery and used to power other components such as bulb, fan, etc. A battery provides direct current (DC) electricity (electricity that flows only in one way and does not reflect). When a battery is giving electric power, red is for supplying DC voltage and black is for grounding.

**DC Relay Module:**

Relay Driver (RD-1) is a totally programmable one channel logic controller is used to manage solid or mechanical state relays in DC and AC voltage power systems. It mainly works as a switch for electronics for on and off. It has 6 pins; VCC, GND, Input pin, normally open, normally closed and common pin.

**Cutter:**

This will be used for the primary function of the mower i.e. to cut the grass. Betting on the planning, over one cutter is also employed in synchronization additionally. Also, cutters with different shape or number of blades is employed for the aim of getting the required cutting speed.

**Wheels:**

These are required for the explanation behind the motion of the body of the robot. The choice of the wheels largely depends on the shape and size of the grass. It'll also depend upon the specified ground clearance of the robot. As treads of the tires can contribute significantly to the performance of the mower, great caution is required during the selection to determine on the particular tires.

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**FUTURE SCOPE:**

This project is completed with the available sources, and also the results are adequate but aren't up to the expectations. Future work will activate the event of the popularity system to extend accuracy and more patterns. Speed of motor is decreased due to the usage of heavy materials, that the more speed of motors are visiting be achieved by using lightweight material and battery. GPS could even be added to the proposed grass cutting system to trace its location. GSM module are often accustomed make capable of sending and receiving messages from the user's portable through SMS if someone doesn't have an android mobile. A wireless camera are visiting be used which is prepared to supply livestreaming and might be used for controlling the grass cutter from faraway places.

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**Conclusion:**

An automatic grass cutter with several features has been proposed. Many related works had been studied so on achieve idea on the thanks to build an automatic tool. Most research is on the trail planning using variety technique. All the technique used are mainly aim for the shortest path, consume less energy.

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