

# **FULLY AUTOMATED SOLAR GRASS CUTTER**

## **PROJECT REFERENCE NO: 39S\_BE\_1251**

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### **INTRODUCTION:**

Grass cutter machines have become very popular today. Most of the times, grass cutter machines are used for soft grass furnishing. In a time where technology is merging with environmental awareness, consumers are looking for ways to contribute to the relief of their own carbon footprints. Pollution is man-made and can be seen in our own daily lives, more specifically in our own homes. Herein, we propose a model of the automatic grass cutting machine powered through solar energy, (nonrenewable energy). Automatic grass cutting machine is a machine which is going to perform the grass cutting operation on its own. This model reduces both environment and noise pollution.

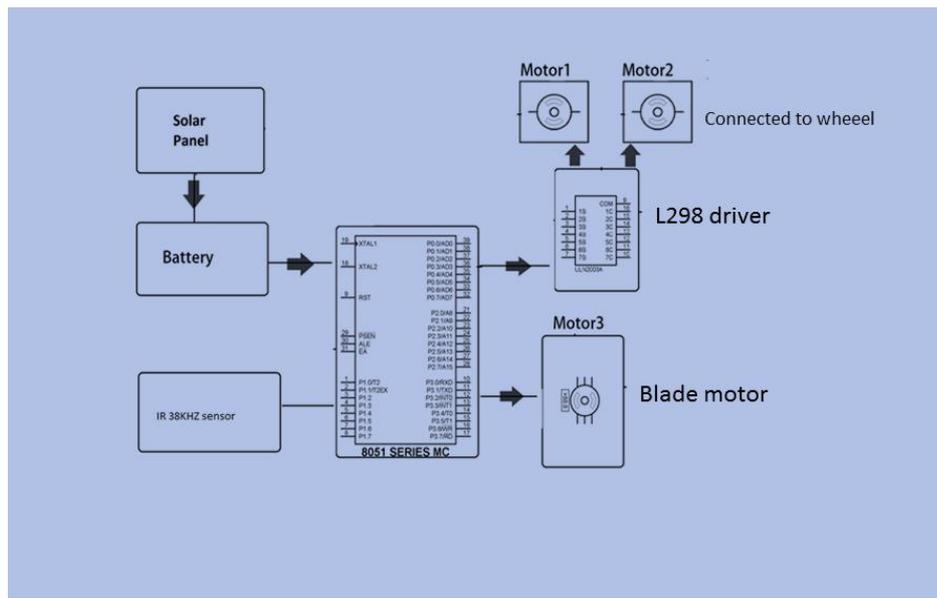
Our new design for an old and outdated habit will help both customer and the environment. This project of a solar powered automatic grass cutter will relieve the consumer from mowing their own lawns and will reduce both environmental and noise pollution. This design is meant to be an alternate green option to the popular and environmentally hazardous fuel powered lawn mower. Ultimately, the consumer will be doing more for the environment while doing less work in their daily lives. The hope is to keep working on this project until a suitable design can be implemented and then be ultimately placed on the market.

### **OBJECTIVE:**

Automated solar grass cutter is a fully automated grass cutting robotic vehicle powered by solar energy that also avoids obstacles and is capable of fully automated grass cutting, without the need of any human interaction. The system uses 12V batteries to power the vehicle movement motors as well as the grass cutter motor. 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 an 8051 family microcontroller that controls the working of all the motors.

It is also interfaced to an IR sensor for object detection. The microcontroller moves the vehicle motors in forward direction in case no obstacle is detected. On obstacle detection, IR sensor monitors it and the microcontroller thus stops the grass cutter motor so as to avoid any damage to the object/human/animal. Microcontroller then turns the robotic vehicle off until it gets clear of the object and then moves the grass cutter in forward direction again.

## METHODOLOGY:



The above block diagram shows a complete view of the final project module

- The source is driven from the solar energy using photovoltaic panel which charges the battery and is utilized for powering operation of the system.
- The system's control is done by the P89V51RD2 microcontroller.
- Automation for object detection is achieved by using 38 KHz IR sensor and microcontroller.
- Wheel movement and cutting operations are done using DC motors.
- To achieve compatibility of microcontroller and the motors a L298 driver circuit is used.
- The driver circuit enhances the microcontroller's small output.
- Toggle switch is used to select the mode of operation and DPDT switch for movement operations.
- Wheel chains with 26 links on both sides are attached to a platform which supports the whole model.
- Wheels move when two motors of 45rpm are driven.
- Cutting blade of length 4cm and width 0.3 cm is used for cutting operations. Cutting action of the blade is provided by a motor of 18000rpm.

## CONCLUSION:

Our project entitled Fully Automated solar grass cutter is successfully completed and results obtained are satisfactory.

## FUTUREWORK:

- 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.