

# Smart Solar Grass Trimmer

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## ABSTRACT

The solar grass trimmer is a fully automated grass cutting robotic vehicle powered by solar energy that avoids obstacles and is capable of fully automated grass cutting without the need of any human intervention.

**Keywords:** Lawn Trimming, Solar Powered, Automatic Object Detection.

## I. INTRODUCTION

The normal lawn trimmers used nowadays are fuel powered and create pollution. Hence in order to provide a more greener and eco friendly option we propose a solar powered lawn trimmer. This project of a solar powered automatic grass cutter will relieve the consumer from cutting their own lawns and will reduce both environmental and noise pollution. Moreover this project is fully automated hence it does not require any human intervention.

This is a fully automated grass cutting robotic vehicle powered by solar energy that also avoid obstacles and is capable of a fully automated grass cutting without the need of any human interaction.

The system uses 12v batteries to power vehicle moment motors as well as the grass cutter motor. we also use the solar panels 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 ultrasonic sensor for object detection.

## II. METHODS AND MATERIAL

### Literature Survey

A typical modern petrol powered lawn trimmer, which has self-powered cutting blades, but still requires

human power to move across the ground. "Follow behind" lawn trimmers are self-propelled, only requiring a human to walk behind and guide the mower. Some types appear very similar to push lawn trimmers, while others are much larger.

The most common power source for lawn trimmer is a small internal combustion engine, particularly for larger, self-propelled mowers. Smaller lawn trimmers often lack any form of propulsion, requiring human power to move over a surface; "follow behind" lawn trimmers are self-propelled, requiring a human only to walk behind and guide them. Larger lawn trimmer are usually either self-propelled "follow behind" types, or more often, are "ride-on" lawn trimmers, equipped so the operator can ride on the mower and control it.

A study shows the around 50-60% air pollution is done because of gas powered grass cutter which emits hydrogen and other harmful gases.

## III. RESULTS AND DISCUSSION

### Basic Operation:

The Automated Solar Lawn Trimmer is based on a locomotive grass cutter robot which is self-driven when once manually started.

The Cutter is mounted on the shaft of a high speed motor so it can have good cutting rate. Solar Grass

Cutter robot is an 8052 based system which is powered up by 12V Battery.

This battery is self-charged during day time by a solar panel when ample amount of sun light is incident upon the solar panel.

Its motion around a grass field is programmed to be linear till it encounters an obstacle.

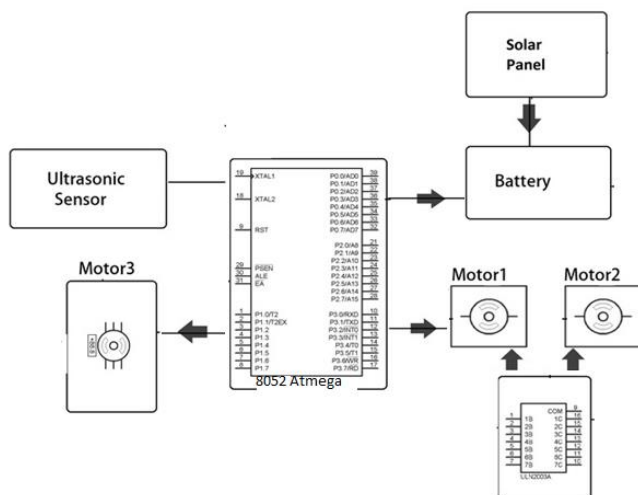
Obstacle is detected using ultrasonic sensor which will detect obstacles using ultrasonic waves.

Whenever an obstacle in its path comes in a range of proximity to the robot, it will change its course and then again continue to go.

So with the help of fences acting as obstacle the grass cutter can be made to trim the entire grass field while avoiding the real obstacles and self sustain on solar energy.

In this way the Fully Automated Solar Grass Cutter is an autonomous system which works once its user has started the system and completes its job.

**Block Diagram:**



**Solar Panel:**

**How does solar panel works:**

Rays of sunlight hit the solar panel and are absorbed by semi-conducting materials such as silicone.

Electrons are knocked loose from their atoms, which allow them to flow through the material to produce electricity. This process whereby light is converted into electricity is called the photovoltaic effect.

An array of solar panels converts solar energy into DC electricity.

**DC Motor:**

A DC motor is an electric motor that runs on direct current (DC) electricity. In any electric motor, operation is based on simple electromagnetism. A current-carrying conductor generates a magnetic field; when this is then placed in an external magnetic field, it will experience a force proportional to the current in the conductor, and to the strength of the external magnetic field

**IV. CONCLUSION**

After implementation of this project we came to a conclusion that though initial investments of the solar powered lawn trimmer are high but this project is more suitable for a common man as it is having much more advantages i.e, no fuel residue, no pollution, no fuel cost and less wear and tear of components.

**V. REFERENCES**

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