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## Mobile Operated Solar Grass Cutter

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### ABSTRACT

Cutting the grass itself requires human effort, time and can create a unique structure of grass length. Therefore to avoid all these problems it is important to build a system that can cutting grass without human involvement. This operation uses a lawn mower with a battery that can be charged with solar power. This can be done using an android phone. This program can be created at a lower cost compared to other existing programs. This is unpredictable, durable and careless. This system is free from pollution due to the use of solar energy to charge the battery.

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**Keywords:** Solar Energy, Arduino, Bluetooth Module, C, C++, Battery, Microcontroller.

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### 1. INTRODUCTION

Automation is useful in various stages of human life. Beautifully cut grass enhances the beauty of any hotel, house, park, conference hall etc. So cutting the same grass is important to maintain the dignity of any house or hotel. Manual lawn mowing may be used by a person but it usually consumes a person's time and energy. And hand-made lawn mowers do not work well and lead to unusual weed formation. So to avoid all these problems it is best to use a lawn mower that can be used with android phone. This application establishes the connection to an android phone using Bluetooth. These mechanical movements include tracking forward, backward, left turns, right turns and cutting grass at opening / closing. All these movements are controlled by the android app. This machine operates on a 12V / 87.5AH battery. To charge the battery the solar panel is connected above the battery.

### OBJECTIVE

- Developing a solar lawn mower. Remote control of solar-powered lawn mowers.
- The solar based grass cutter keeps the environment clean and healthy.
- Every machine operates on solar energy stored in batteries

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### 2. LITERATURE REVIEW

Grass keeping grass gives a sense of beauty to people. Grass storage can be done with the help of a lawn mower. The operation of the lawn mower is very difficult. The automatic grass cutter provides minimal human intervention. It works with the help of solar energy. As a result, there is no contamination. The grass cutter is integrated with the alphabet print and the pesticide spray. The noise produced by the cutter is very low, so it can be used in quiet places such as hospitals, educational institutions. The grass cutter is integrated with the grain printing system on the grass. Letter printing to cut grass in alphabetical order. The pesticide spray is also combined with a grass cutter. All of these machines are available as separate machines that require additional space and the cost of purchasing different equipment will be higher. The main benefit of our project is to reduce the space, cost and human resources required. Authors: M. Manimegalai; V. Mekala; N. Prabhuram; D. Suganthan Published in: 2018 International Conference on Intelligent Computing and Communication for Smart World (I2C2SW).

These days we are facing problems such as pollution, power outages etc. To overcome these problems, think of a machine, which can perform its functions without causing any of these problems. So we decided to do a grass cutting project, this uses renewable energy source in its function as solar energy. The project aims to build a solar-powered lawn mower, as there is a shortage of energy. So we decided to make a device that uses solar energy. The solar panel is connected to the battery. Then by connecting the inverter to the DC current battery is converted to current AC. This will use the AC engine. This motor is connected to the blade shaft with the help of a belt drive. This will rotate the blade at high speed, cutting the grass. This device will help to create an eco-friendly system. Modern technology that is commonly used to cut grass with a hand-held device. In this paper the technology of the novel is used. So in this paper we are trying to make a daily working robot that can cut grass on the Lawn. The system will have some automated function to get direction and other obstacle detection and a battery power source and solar panel will be attached to the top of the robot as a result of this reducing the power problem. Authors: #1 Vinay R. Lonare, #2 Rahul Sakat, #3 Prof. Mrs. S. N. Chaphekar Published in: 5 th June 2019.

Today, we know that solar energy is a renewable energy source. And fossil fuels may not be available in the future and pollute our environment. So we have to use, one of the most promising energy sources where everyone is focused on the idea of solar energy and its use. A smart lawn mower detects obstacles with an ultrasonic servo sensor with a wide range of avoidance barriers without the need for human interaction. All engines, sensors and cutting function are automatically controlled by Arduino and manually via a Bluetooth module. Also the cutting work is done with a single metal wire used by a DC motor (10000 rpm). The cutting-edge robot batteries are charged with a separate grounding charger. The charging dock is attached to the Solar panel with the charging controller. Authors: Ajit Singh Shekhawat | Nikesh Kumar | Roopal Yadav | Siddharth Tyagi | Arun Pratap Singh Published in: Volume-3 | Issue-3, April 2019

### 3. SYSTEM MODELLING

#### INTRODUCTION

The solar panel stores DC power in the battery via the charging controller. The charging controller uses a stable battery charge when the sun's power fluctuates depending on the amount of sunlight, which protects the charge and protects the charge. Bluetooth is a standard protocol for sending and receiving data via a 2.4GHz wireless connector. It is a secure protocol, and is suitable for short distance, low power, low cost, wireless shipping between Arduino. Bluetooth connects Bluetooth mobile phone due to the same technology and protocol, in a mobile application connected to Arduino via Bluetooth to transfer data from mobile to Arduino, its control signal. Arduino is a smart Board system where the Atmega382p microcontroller is used in advance. It is a system intelligence to control both motors simultaneously with the driver's circuit and ON / OFF grass cutter motor using the ON / OFF relay. The car driver is a circuit that is actually used to amplify the Arduino signal and gives the engine and car rotation clockwise or counter-clockwise. All functions displayed on the LCD display. The LCD display is a Liquid Crystal display which is to show the letters of the alphabet and sixteen two-line numbers.

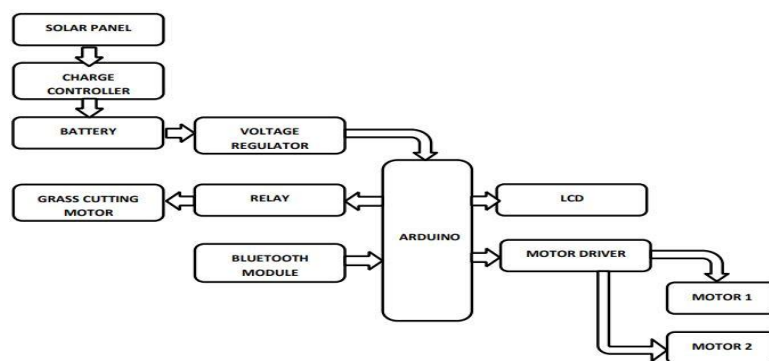


Fig.1: Block Diagram

## ARDUINO

Arduino is an open-source computer and software company, project, and user community that designs and manufactures single-board microcontrollers and microcontroller kits to build digital devices. Arduino board designs use a variety of microprocessors and controls. Boards equipped with sets of digital anchors and analog input / output (I / O) that can be connected to various expansion boards ('shields') or breadboards (for prototyping) and other circuits. Boards that include a series of communication links, including Universal Serial Bus (USB) in some models, are used to load programs. Minor controls can be configured using programming languages via the API and the API control API, which is promoted by the Processing Language and used with the modified version of the Process IDE.

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## 4. IMPLEMENTATION

### WORKING

Initially, the solar panel will receive solar radiation, which generates electricity due to the photovoltaic effect. The electricity produced is stored on batteries. Power from the battery is provided by a small controller (Arduino NANO) that controls the operation of the device for automatic use.

It uses DC gear motors connected to the car's three wheels, which assist in rotating the wheels and gear motor driven by the motor driver, which in turn connects to the microcontroller. The DC motor is connected to the blade, which is mounted on the side of the motor and assists the blade rotation. The motor is centered on the blade, mounted on an adjustable plate so that the blade height is adjusted from 10mm to 150 mm from the ground level. The blade is designed to cut grass perfectly. In terms of environmental awareness, Solar Grass Cutter is very effective and environmentally friendly and overcomes obstacles of fuel-based grass cutters such as (i) fuel, non-renewable, (ii) Require proper care, such as lubricants. The main components of the Solar Grass Cutter model are solar panels, batteries, microcontroller, sensors, motor driver, DC motors and blade. Many solar energy was collected, with the help of a solar panel used as a source of energy. Batteries used to store energy are generated by solar panels. A small controller is used to store system codes that control the movement of the model. Two types of DC motors have been used based on the need for rotation speed. DC motors with 30 RPM used to move the car and DC motors with 3000 RPM used for blade rotation. The prototype blade can be adjusted based on the height of the grass that needs to be removed. The minimum length of grass can be cut in this example is 10 mm and the maximum length is up to 150 mm.



Fig.2: System Model

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## 5. RESULT & CONCLUSION

To revive all the literature review and to know our needs, a suitable design for cutting the sun grass is made. The components are selected based on the design requirement and a few parameters are considered to meet all the constraints. Based on the revive prototype model of hardware and software system was demonstrated and the required output was obtained. The blade is designed in such a way that it can cut grass quite well and the height from the ground level can be adjusted from 10 mm to 150 mm. The panel is placed in a position where it can receive high intensity of sunlight. So among the eco-friendly grass cutter this device is the most effective.

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