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BLUETOOTH CONTROLLED AND SOLAR POWERED GRASS CUTTER

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ABSTRACT: -

Nowadays, Solar Energy is Most abundantly Available and purest form of energy on the earth, it is available in the form of radiation. Using this Solar radiation we have introduces a new Concept Called Bluetooth Controlled and Solar Powered Grass Cutter. This system is based on solar applied and Bluetooth Controlled. Grass cutter works on the Solar powered and operated on Bluetooth. It Avoids Obstacles. The system used 3.7V batteries to power the vehicle motors as well as the Arduino UNO grass cutter motor. We Have also used a solar panel to charge the battery so that there is no need of charging it externally. The grasscutter and vehicle motors are interfaced to an Arduino family microcontroller and Bluetooth technology that controls the working of all the motors. Here we have interfaced Bluetooth sensor for controlling robot. The microcontroller moves the vehicle motors in forwarding back, left, right directions.

Keywords:

1. Non- Renewable Energy
2. Solar Radiation
3. Operated on Bluetooth
3.7 V Battery
4. Solar Pannel
5. Bluetooth Technology

I – INTRODUCTION

pollution is the major issue in the Environment, Gas powered Grass cutter which emits the gases it's accountable for pollution. Therefore, the fuel price is increasing day-by-day, therefore it's not economical. So, we have introduced a new System This system was fully automated based on solar applied in grasscutter is a fully automated grass cutting robotic vehicle powered by solar energy that also avoids obstacles and is capable of fully automated grass cutting. The system used 3.7V batteries to power the vehicle movement motors as well as the grass cutter motor. We also using a solar panel to charge the 3.7 V batteries . The grasscutter and vehicle motors are interfaced to an Arduino family microcontroller and Bluetooth technology that controls the working of all the motors. Here we have interfaced Bluetooth sensor for controlling robot. The microcontroller moves the vehicle motors in forwarding back, left, right direction.

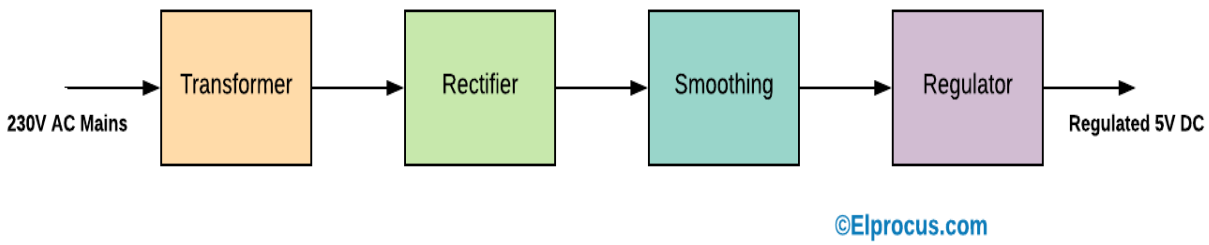
1.1 REGULATED POWER SUPPLY

Bluetooth-controlled and solar-powered grass cutter, a regulated power supply is essential to Perform essential operations. This power supply needs to efficiently manage the energy harvested from the solar panels and distribute it appropriately to power the cutter's motor, Bluetooth module, and any other electronic components.

A power supply can be used for Powering the electrical components which are used in the Bluetooth controlled solar powered grass cutter.

The power supply helps in providing the necessary amount of power to the components.

The Construction and Working of Regulated Power supply is given below:



HARDWARE COMPONENTS:

1. **Power Supply**
2. **Software Components:**
- Arduino IDE
- Embaded C
3. **Hardware Components:**
- Motor Driver
- DC Motor
- Solar Pannels
- 12 V Battery
- Blades
- Atmega 328s
- Robot Chassis
- Bluetooth Module HC-05
- Battery Connector

II. 1 Power Supply:

A Power supply is an Electric Device that supplies electric power to an electric load.
The main purpose of a power supply is to convert electric current from a source to the correct voltage, current and frequency to the power load.
In Bluetooth Grass cutter Power supply is solar Pannel Recharges the battery and the battery power is used for the further requirements

II. 2 Software Components:

Arduino IDE: We are using C++ and as well as Embedded C.
Embedded C: It is the language used for embedded devices

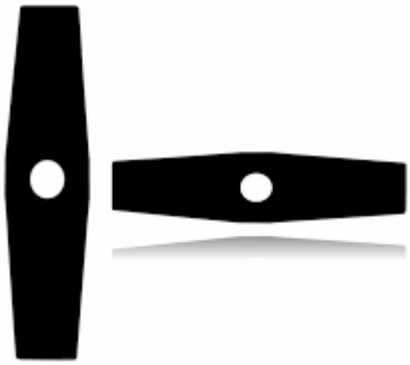
II. 3 HARDWARE COMPONENTS:

Motor Driver: Motor Driver is used in This project. It controls the working of motor and supplies power to each motor equally.
DC Motor: A DC motor is mostly used to move a vehicle from one to another place. DC motor is powered by small amount of electricity in to run it.

Solar Panels: Solar Panels can convert solar energy into electrical energy.

3.7 V Battery: We are using Batte

Blades: In this project we have used Thin blades which helps in cutting of grass.



Bluetooth Module HC-05:
Bluetooth module is used in Grass Cutter Which Helps in Wireless Communication.

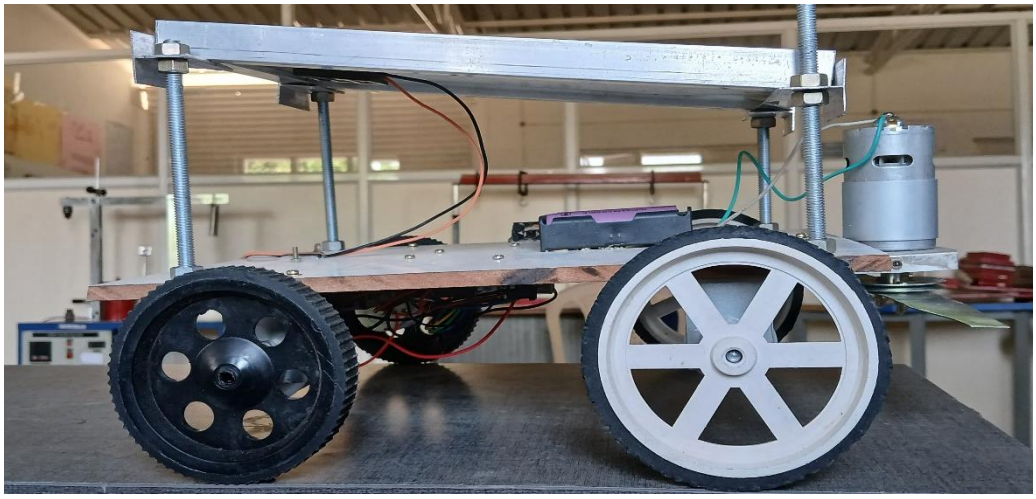
Atmega 328s: It is a microcontroller used for many of the power tools and embedded devices to control the device.

Robot Chassis: Robotic chassis helps to hold each hardware component on it and it Helps to hold the electrical components on it.

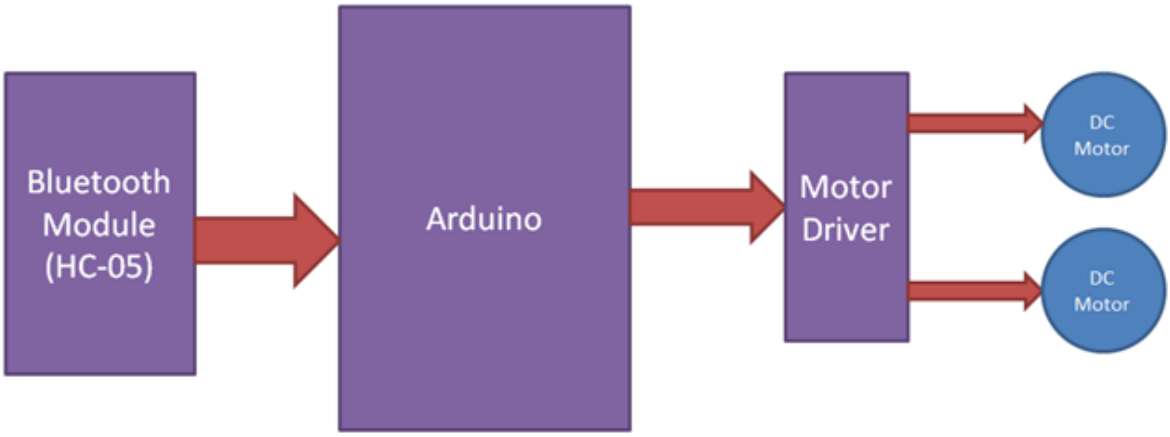
DESIGNING OF A BLUETOOTH CONTROLED AND SOLAR POWERED GRASS CUTTER:

In this project we are going to develop a Bluetooth controlled and Solar Powered Grass Cutter. we used a Bluetooth module to control the robot grass cutter.

- It is also an android based application.
- Automatic Grass Cutters using very basic Bluetooth technology.
- We are going to develop a system that can cut the excess grass of the garden automatically. If there is an obstacle grass in the garden.
- It helps in people reducing the effort of doing work.



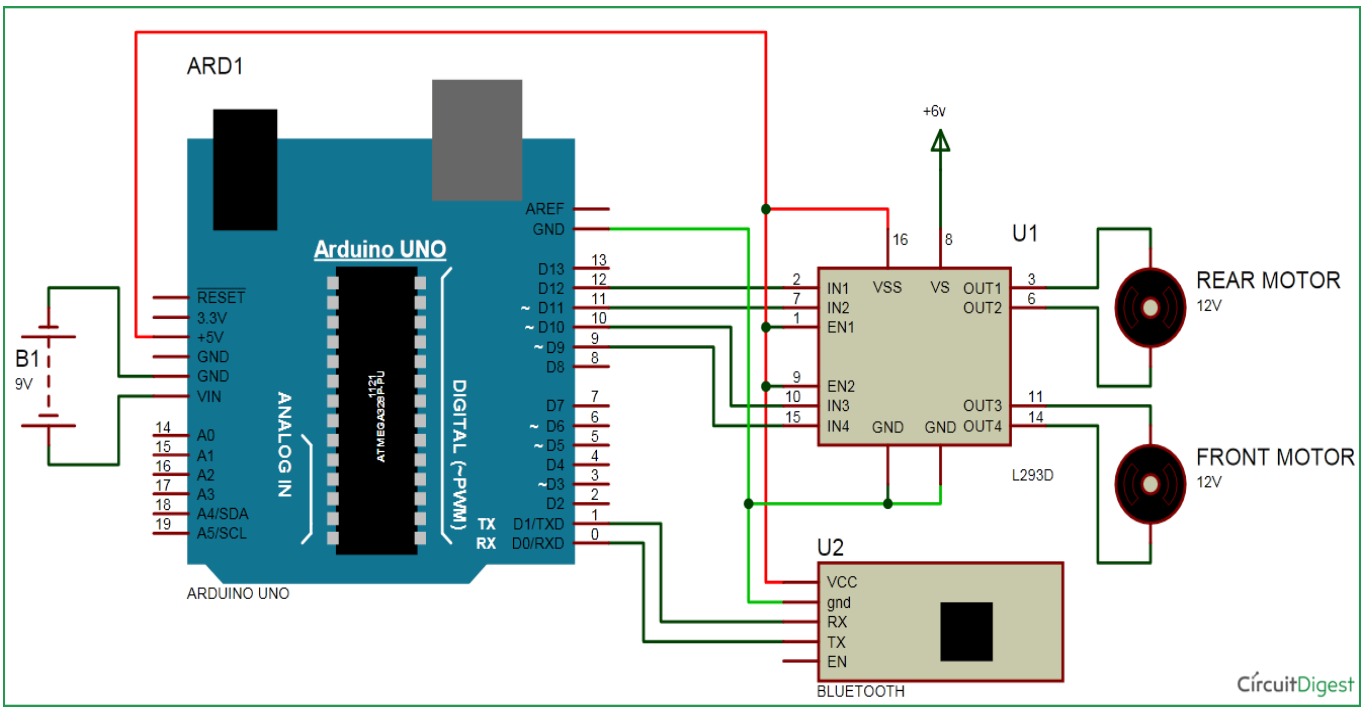
IV WORKING OF BLUETOOTH CONTROLLED GRASS CUTTER:

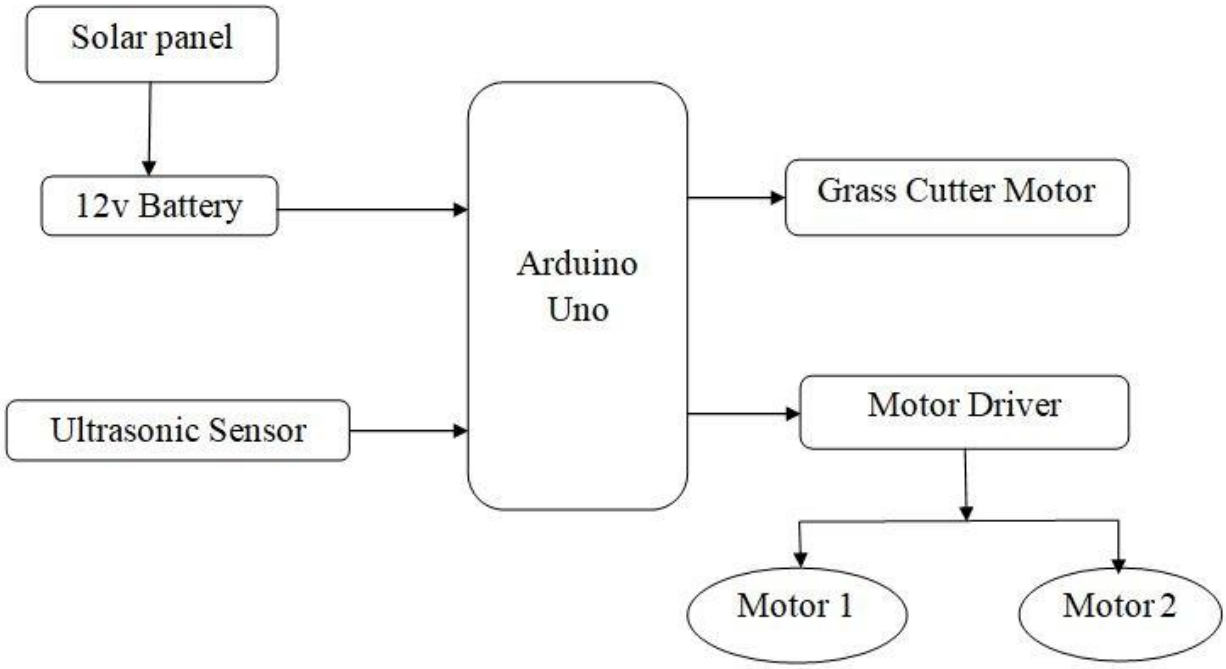


ADVANTAGES OF BLUETOOTH CONTROLED

1. Less use of Fuel.
2. Eco- Friendly.
3. No Need of Labor.
4. Reduce labor cost

III. Working Process:





SECIFICATION OF MAJOR COMPONENTS:

III-1 Solar Pannel:

- Maximum power (Pmax): 5 Watts.
- Nominal voltage: 12 Volts DC.
- Voltage at Pmax (amp): 17.0 Volts DC.

III-2 HC-05 BLUETOOTH MODULE:

- Serial Bluetooth module for Arduino and other microcontrollers
- Can operate in Master, Slave or Master/Slave mode

- Can be easily interfaced with Laptop or Mobile phones with Bluetooth

III-3 L298N Motor Driver Module:

- Operating Voltage :5V-46V.
- Operating Current: 2A.
- Logic Voltage: 5V.
- Logic Current: 0-36 mA.
- III- 4 Arduino UNO:
- Microcontroller: ATmega168.
- Operating Voltage: 5V.
- Input Voltage: 7-12V.
- Digital Input pins: 14.
- Analog Input Pins: 6.
- DC Current per I/O Pin: 40 mA
- DC Current for 3.3V Pin: 50Ma
- Flash Memory: 32 KB (ATmega328)
- SRAM: 2KB (ATmega328)
- Clock Speed: 16 MHz.

IV- Code for Motor Moving in forward, Backward, rear and front direction:

```
#define m11 11
#define m12 12
#define m21 10
#define m22 9
And then in setup, we gave directions to pin.
void setup ()
{
  Serial.begin(9600);
  pinMode(m11, OUTPUT);
  pinMode(m12, OUTPUT);
  pinMode(m21, OUTPUT);
  pinMode(m22, OUTPUT);
}
void loop ()
{
  While (Serial.available())
  {
    char ch=Serial.read();
    str[i++] =ch;

    if(str[i-1] =='1')
    {
     Serial.println("Forward");
     Forward ();
     i=0;
    else if(str[i-1] =='2')
    {
     Serial.println("Left");
     Right ();
     i=0;
    }
else if(str[i-1] =='3')
    {
      Serial.println("Right");
      Left ();
      i=0;
    }
```

There are five conditions for this Bluetooth controlled Wheel chair which are used to give directions:

Touched button in Bluetooth controller app	Output for front side motor to give direction		Output for rear side motor to move forward or reverse direction		
Button	M11	M12	M21	M22	Direction
Stop	0	0	0	0	Stop
Forward	0	0	0	1	Forward
Backward	0	0	1	0	Backward
Right	1	0	0	1	Right
left	0	1	0	1	Left

Code:

```
#define m11 11
#define m12 12
#define m21 10
#define m22 9
char str[2],i;
void forward ()
{
  digitalWrite(m11, LOW);
  digitalWrite(m12, LOW);
  digitalWrite(m21, HIGH);
  digitalWrite(m22, LOW);
}
void backward ()
{
  digitalWrite(m11, LOW);
  digitalWrite(m12, LOW);
  digitalWrite(m21, LOW);
  digitalWrite(m22, HIGH);
}
void left ()
{
  digitalWrite(m11, HIGH);
  digitalWrite(m12, LOW);
  delay(100);
  digitalWrite(m21, HIGH);
  digitalWrite(m22, LOW);
}
void right ()
{
  digitalWrite(m11, LOW);
  digitalWrite(m12, HIGH);
  delay(100);
  digitalWrite(m21, HIGH);
  digitalWrite(m22, LOW);
}
void Stop ()
{
  digitalWrite(m11, LOW);
```

```
  digitalWrite(m12, LOW);
  digitalWrite(m21, LOW);
  digitalWrite(m22, LOW);
}
void setup ()
{
 Serial.begin(9600);
 pinMode(m11, OUTPUT);
 pinMode(m12, OUTPUT);
 pinMode(m21, OUTPUT);
 pinMode(m22, OUTPUT);
}
void loop ()
{
 while(Serial.available())
 {
   char ch=Serial.read();
   str[i++] =ch;

   if(str[i-1] =='1')
   {
    Serial.println("Forward");
    forward();
    i=0;
   }
   else if(str[i-1] =='2')
   {
    Serial.println("Left");
    right();
    i=0;
   }
   else if(str[i-1] =='3')
   {
     Serial.println("Right");
     left();
     i=0;
   }

   else if(str[i-1]=='4')
   {
     Serial.println("Backward");
     backward();
     i=0;
   }
   else if(str[i-1] =='5')
   {
     Serial.println("Stop");
     Stop();
     i=0;
   }
   delay(100);
 }
}
```

V- RESULT:

"Bluetooth Controlled Grass Cutter" is mainly designed to eradicate use of fossil fuel and use of natural resources and prevent from pollution.

VI – CONCLUSION:

A "Bluetooth-controlled grass cutter" offers convenience and control for users. With the ability to remotely operate the cutter via a smartphone or tablet, it is a IOT Based Application users can easily manage their lawn care tasks. This technology allows for precise navigation and customization, enhancing efficiency and user experience.

VII – FEATURE SCOPE:

"Bluetooth Controlled Grass Cutter" is mainly used in places like Schools, Offices, Apartments, Colleges, Businesses Parks. Apart from this it has a capable of advancements in several area like:

1. Smart Appliances.
2. Wireless Based Communication.
3. IOT Based Applications.

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