WIRELESS LAWN MOWER

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Abstract: **In today's time the concept of robots is seen as a way to reduce the human efforts and increase the productivity without compromising on quality and accuracy of the work. This project considers the implementation of a robot which can be operated wirelessly using Bluetooth technology. Integrating hardware and software is the key for this project. By integrating hardware and software, the students found just how much technology can be used to develop an outstanding project. The group went a step further by creating an even safer version of the mower. In addition, the autonomous version is also much more convenient for the user. The project includes a heavy amount of circuitry, programming, and integration of the two. The project was done in two different stages. The first stage the group completed was the android application for the wireless control of the Lawn Mower. The second stage of their project was creating an Autonomous Lawn Mower. This report describes different aspects (Technical and Non-Technical) of the lawnmower.**

Keywords: **Lawn mower, Bluetooth communication, Android application, Microcontroller, Transmission, Reception.**

I. INTRODUCTION

Mowing the lawn with a standard motor powered lawn mower is an inconvenience, and no one takes pleasure in it. Cutting grass cannot be easily accomplished by elderly, younger, or disabled people. So the object of our project is to designing a robot which will enable human beings to perform a tedious job in a simple way. So the objective of our project is the same as we are designing a robot which will enable human beings to perform a tedious job in a simple way.As the name of the project suggests the robot will be used to cut down the grass in the lawn but in this case there is no need for us to move an inch from our place to run the cutter over the lawn.The project is set upinto three different categories, electrical, software and mechanical. The electrical sections looks after the electrical components; the batteries, the motor. The software section deals with the development of the android application for wireless transmission between the robot and the Bluetooth of the smartphone. The mechanical section deals with the mechanical components, the deck, the chassis, wheels, blades, mounting brackets, and the wheel adaptors etc.Throughout the design process projects are assigned according to the engineering discipline required. It is important to take a system approach to this project to ensure all subsystems are accurately integrated into a complete unit.This prototype will be automatic and will run on a charged battery with no cords to interfere with operation. This cordless electric lawn mower is based on the Bluetooth pairing capability which is less expensive than a robotic lawn mower.This self-propelling lawn mower design is comprised of Bluetooth communication and autonomous capability that is user friendly so most consumers will be able to use this device. It is safe to use, as well as efficient because it electric powered and cordless.
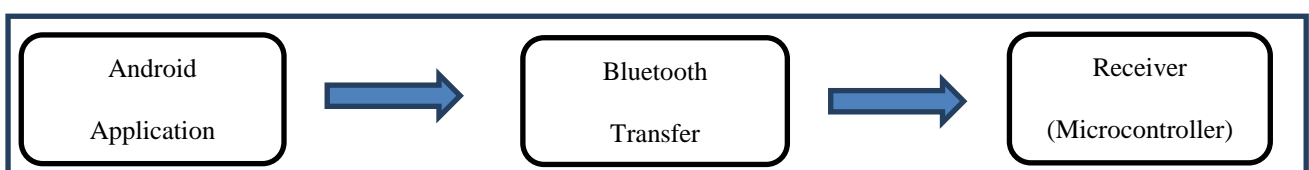

Fig. 1 Block diagram explaining working of the project

II.   DESIGN

Hardware:

Electronic   hardware consists   of   interconnected electronic   components which   perform analog or logic operations   on received and locally stored information to produce as output or store resulting new information or to provide control for output actuator mechanisms. Different parts are as follows:

Software:

To   command   the   Robot   an   Android application   package   file (APK)   is   the file   format used   to   distribute   and install application software and Google's Android operating system. To make an APK file, a program for Android is first compiled, and then all of its parts are packaged into one file. MIT App Inventor is used to develop this .apk application**.**

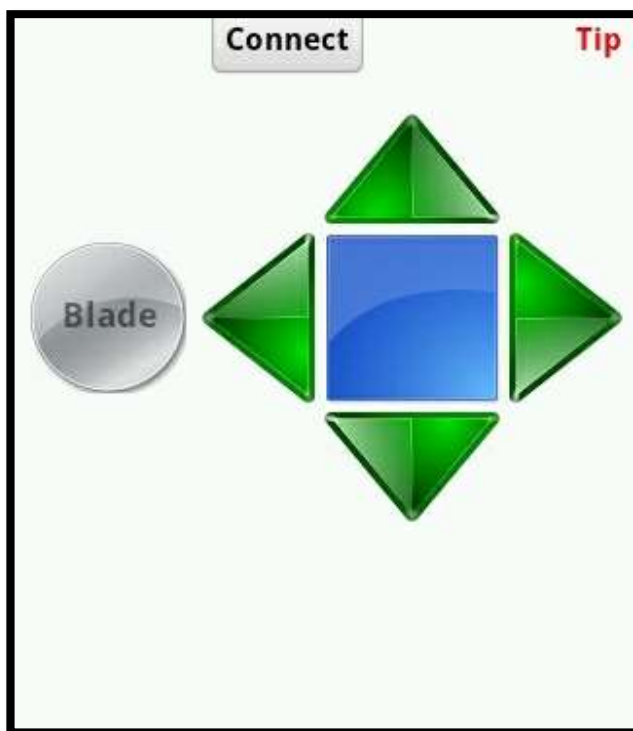Link for an android application which will be used to control the robot wirelessly;
http://www.mediafire.com/download/o98l2m915qzk8z1/BlueBot.apk

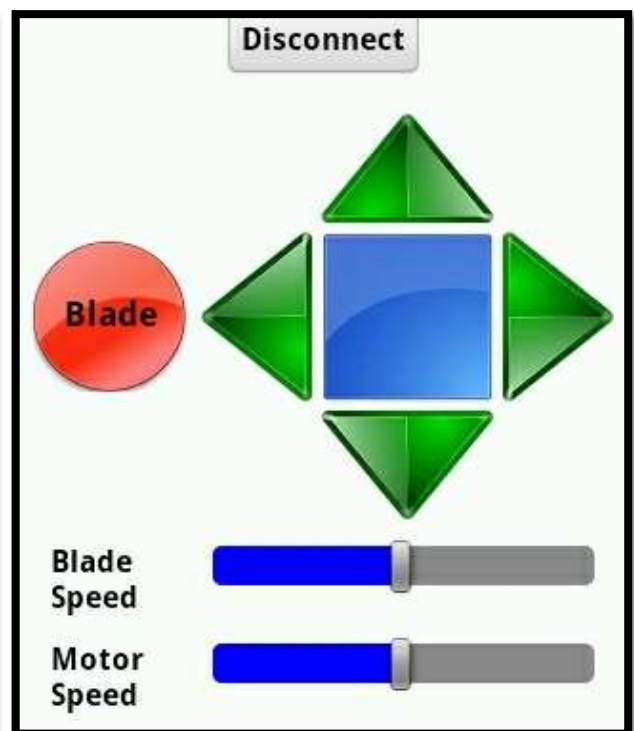**Fig 2(a).Graphical User Interface of the .apk file**   **Fig 2(b).Graphical User Interface after pairing**

III.   PRINCIPLE OF OPERATION

Transmission:

Smartphone running on Android platformbased application will be having a GUI as shown in Fig 2(a).The application has simple navigation controls right, left, forward, backward. Also it has a blade speed and motor speed controllers as shown in Fig 2(b).

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Reception:

The transmitted signal will be received by the Bluetooth receiver built on the robot.. The receiver will receive serial data bits sent from mobile. After sensing those bits will be sent ahead for further processing. The signal will be processed by a microprocessor based system and the processor itself will drive the motors. Motor driver is nothing but a collection of Transistorized switches which controls and guides the movement of the rotating motors which are connected to the wheels of the robot.

The table below shows the data sent via Bluetooth when any of these navigation keys is pressed;

Button	Data Sent
up arrow	a
down arrow	b
left arrow	c
right arrow	d
stop	e
blade	f(on) / g(off)
Blade speed slider	sends number from 1 to 50 with step of 1
Motor speed slider	sends number from 51 to 100 with step of 1

CONCLUSION

With the safe, reliable, cheap, and user friendly Bluetooth controlled lawn mower, the Robotic Lawn Mower would be a must have item in every household as it is Time Efficient and requires very less efforts on the field.That is why Along with the various ages of users, this lawn mower can also be used by people who have disabilities and are unable to use a regular push, or riding lawn mower. Due to this it will createemployment opportunities for physically disabled peoples and aged persons too. Also,Project will help farmers by saving their time.Further modification can be made so that it can also be used as surveillance robot.

ACKNOWLEDGEMENT

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