Smartphone Operated Robot using Bluetooth

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Abstract— with increase in demand of technology, field of information technology is booming. With the development of computer embedded technology, the Bluetooth and Smartphone have become more and more common in our daily lives. The Robot also comes gradually into the picture. This concept can be taken care into many applications from many one of which is travelling purposes. An electric skateboard which is a very upcoming mode of short travelling purpose can be controlled in many ways and one upcoming way is through the control of Smartphone. The Bluetooth technology and Smartphone makes it possible for us to control the robot in the visual interface. The affordability of Smartphone has increased in recent years. So this technology can be useful to a layman with zero knowledge of robotics.

Key words: Bluetooth, Booming

I. INTRODUCTION

The project intends to develop an electrical skateboard which is controlled using an Android Smartphone via Android application and Bluetooth module. Android Smartphone will act as remote control of the skateboard. The Microcontroller acts as the brain of the skateboard. Bluetooth module, sensors, dc motors, motor driver are interfaced to the Microcontroller. Aluminum plates will give mechanical and physical strength to the skateboard. Robots are a widely explored field in today's scenario. With the growing invention of transistors and integrated circuits, computer industry added brains to the brawn of already existing machines. Now a day's Android smart phones are the most popular gadget. There are multiple applications on the internet that exploit inbuilt hardware in these mobile phones to control other devices. With the development of modern technology and Android Smartphone, Bluetooth technology aims to exchange data wirelessly at a short distance using radio wave transmission comprising features to create ease, perception and controllability.

II. IMPLEMENTATION

An Android Smartphone will serve as a remote control device for the movement of the robot. The Android application will be developed for the same. The Bluetooth module will act as a communication interface between Smartphone and Microcontroller. We will be using HC-05 Bluetooth module for the system, which can be used as a master or a slave. Generally our master will be Smartphone and Bluetooth module will be slave. Bluetooth module will pass on the commands given by Smartphone to the Microcontroller. Microcontroller will serve as the brain of the robot. The robot maneuver will be decided by the Microcontroller. In this system we will be using Microcontroller named Arduino Uno which contains Atmega 328p Microcontroller chip. The Microcontroller will be programmed with the help of the Embedded C programming. Arduino provides its own programming environment which controls the Microcontroller through the programmed codes.

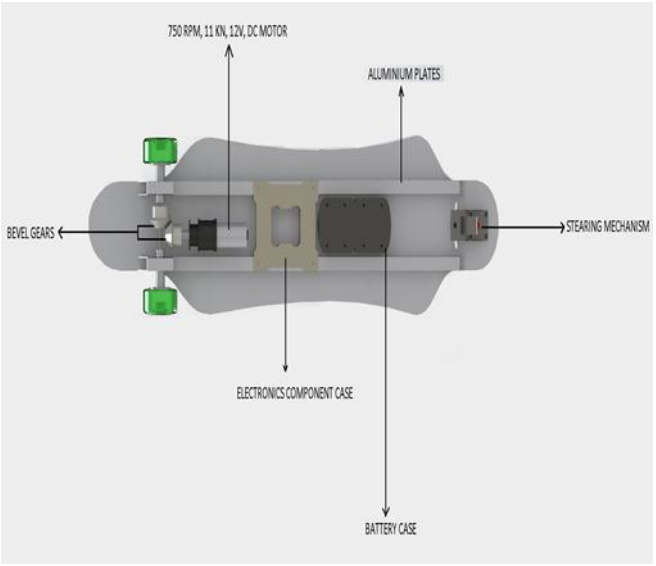

Fig. 1: Architecture of Skateboard

As our system is for travelling purpose we will be using a DC motor. It generates a high amount of power and torque which will provide enough force to drive a human being. A motor driver will be used to control the DC motor, which will be connected to the Microcontroller and the Bluetooth module will be connected to the same. In this proposed system we will be using any rechargeable battery to supply power to the electronic components of the system. Mainly the Microcontroller and DC motor will be in need of power supply. The model represents a general idea how our robot will look like as shown in fig. 1. DC motor is 750 rpm and 11Knm motor which will be able to drive about 80-90 kg weight. Motor driver is used to control DC motor, which will be of 24 volts made up using H-bridge. The Microcontroller is the Brain of the robot and is used to connect the Smartphone through the Bluetooth module. The motor belt driver is used to connect the wheels of the skateboard and the dc motor through driving cog. The entire electronic component except the motor and belt will be kept in Electronic component case. Android Smartphone: The Android Smartphone will act as a remote control for the robot. Acceleration and de-acceleration of the robot can be done with the help of the Android Smartphone. All Electronic and mechanical component will be mounted on the skateboard. To provide mechanical strength to the board for bearing extra weight an aluminum plates will be bounded with the skateboard. This will increase the physical strength of the skateboard. Bevel Gears are used for gearing mechanism.

III. INFORMATION ABOUT THE SYSTEM

The basic idea that will show is how to use Smartphone instead of various control applications that need high computational power and extra space for remote's and other controlling devices. So Android Smartphone can be used as a controlling device with the help of a proper Android application. A robot is a mechanical device used by the mankind for the well-being of mankind. So another prospect

use of a robot can be for travelling purpose if equipped with proper electronic components. The interaction of robot and Android Smartphone can be done through Bluetooth technology. The Smartphone will connect to the robot using a Bluetooth connection that carries signals between the two ends. The Smartphone application will be developed in such a way that it is compatible to all the current versions of Android. The Smartphone application will correspond to the robot with the help of Bluetooth module which is built-in on the Robot. The robot that is the skateboard (from the view of our project) is mechanically modified in order to fit the Bluetooth module and Microcontroller. The Microcontroller will read the instructions from the Smartphone application with the help of Bluetooth and will manage the Robot with the help of DC motor.

IV. CONCLUSION

The proposed system shows how the android smartphone can be used as remote controller for robot and various embedded technologies with the help of the Bluetooth technology. The proposed system also shows that how a robot can be used for travelling purpose. The operating system of smartphone is Android, and it can develop effective remote control program and by using Bluetooth network, the communication between smartphone and robot can be realized, which makes it simple and convenient to control robot.

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