Bluetooth Remote Controlled Car Using Arduino

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Abstract- *Our project relies on Arduino, Motor driver and Bluetooth module. The Arduino micro-controller is an open-source prototyping platform based on easy-to-use hardware and software. Arduino uses an ATmega328 microcontroller. Nowadays, robotics has become a major part in our daily life and also in the engineering field and it plays a crucial role in the development of the latest technology. Our project is a very simple and easy type form of remote control car, where the normal micro-controller has been replaced by Arduino and the IR sensors has been replaced by a Bluetooth module. The remote can be any android or IOS cell phone. This project can also be created in a bigger scale for real timevehicles.*

Keywords- Arduino Uno, Arduino IDE, Motor Driver, Battery and Motor.

I. INTRODUCTION

The Arduino Uno is a microcontroller board based on the ATmega328P. It has fourteen digital input/output pins, six analog inputs, a sixteen MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. It consists of everything that is required to support the microcontroller; simply connect it to a computer with a USB cable or power it with an AC-to-DC adapter or battery to get started. You will be able to tinker with your UNO without concerning too much about doing something wrong, in the worst case scenario you can replace the chip for a few hundred rupees and start over again. The word "Uno" means one in Italian language and was chosen to mark the release of Arduino Software (IDE) 1.0. Uno board and version 1.0 of Arduino Software (IDE) were the reference versions of Arduino. The Arduino Uno board is the first in a series of USB Arduino boards. The L298 motor-driver is an integrated monolithic circuit in a 15-lead Multi watt and PowerSO20 packages. It is a high voltage, high current dual full-bridge driver designed and developed to accept standard TTL logic levels and drive inductive loads such as relays, solenoids, DC and stepping motors. It is provided with two enable inputs to enable or disable the device independently of the input signals. While assembling, the emitters of the lower transistors of every bridge are connected together and the corresponding external terminal can be used for the connection of an external sensing resistor.

There is an additional supply input which is provided so that the logic works at a lower voltage. The Bluetooth technology is a wireless technology standard for exchanging data over short distances from fixed and mobile devices in order to create personal area networks (PANs).

WHY ARDUINO?

- We've used Arduino because it is an open source device which can be programmed through any operating system like Windows, Mac, Linux,etc.
- The language used for coding is comprehensible and straightforward.
- The Arduino micro-controller can be used by anyone from a beginner in robotics toprofessionals.
- Changes in the program code can be doneeasily.
- Shield(external circuits) are available in the market for various purpose like, for controlling a motor; motor shield is available, if we want to connect the arduino to a network then a Wi-Fi shield is available whilst for this project a Bluetooth shield is used.

II. LITERATUREREVIEW

According to Tashi Rapden Wangchuk, "The Arduino is an open source device that has been the brain for numerous projects. The Arduino has everything that is required by the user which includes its inbuilt converter, I/O pins etc. With the combination of Arduino, and the Bluetooth Shield we can control over many other things, like home Lightings, air conditioner and many more through our cell phones. The Arduino can also contribute at large for the Smart-Home system. By doing this Project they found out a lot about the Arduino, and how it has made us easier to convert digital signals into physical movements"[1].

According to Rajesh Bhatt and Subankar Roy, "The Wireless control is one of the most important basic needs for all the people all over the world. But unfortunately the technology is not fully utilized due to a huge amount of data and communication overheads. Generally many of the wireless controlled robots use RF modules. But our project for robotic control makes use of Android mobile phone which is

very cheap and easily available. The available control commands are more than RF modules."[2]

According to Ms. S.T. Shibe and Prof. S.S.Joshi, "The robotics and automation industry which ruled the various sectors from manufacturing to household entertainments robotics is widely used because of its simplicity and ability to modify to meet changes of needs. The project is designed todevelop android application based a robotic vehicle for remote operation. This is a kind of robot can be helpful for mobility aid for elderly and disabled people."[3]

According to Everton Rafael da Silva and Breno Lisi Romano, "This project aimed to design an automated vehicle prototype built with Arduino and controlled with software developed on Android that can perform manual or automatic paths. Until now research and analyzing the simulation of experiments shown, it is believed that it is feasible to use the prototype designed to cognitive development, for future users can learn to insert custom paths that can process logic issues and more complex mathematics allowing the prototype perform the desired movements. Analyzing the financial costs of design, it is believed that it is feasible to construct this type of prototype because it presents a low cost of the components used, particularly if they choose in a large scale production. It is worth noting that both the Java programming language as the language for Arduino in development are free, not burdening additional costs for the development of the project, pointing out that this applies also the tools used for development."[4-5].

III. METHODOLOGY

Components Used

Power Supply: A power supply is an electronic device that provides electrical energy to an electrical load. The main function of a power supply is to convert one sort of electrical energy to another and as a result, power supplies are sometimes referred to as electric power converters.

Bluetooth module: Bluetooth module is a tiny wireless serial communication module which can be connected with a Micro-Controller to receive and send data when connected with other Bluetooth devices.

Arduino-UNO: Arduino is an open-source prototyping platform which is based on easy-to-use hardware and software. Arduino consists of both a physical programmable circuit board and software or IDE (Integrated Development Environment) that runs on your computer which is used to write and upload computer-code to the physical board.

Motor driver: It is a tiny circuit that consists of the motor driving IC, and can handle two motors at the same time. It controls the speed of the motor by pulse width modulation (PMW).Figure 1 shows the circuit diagram.

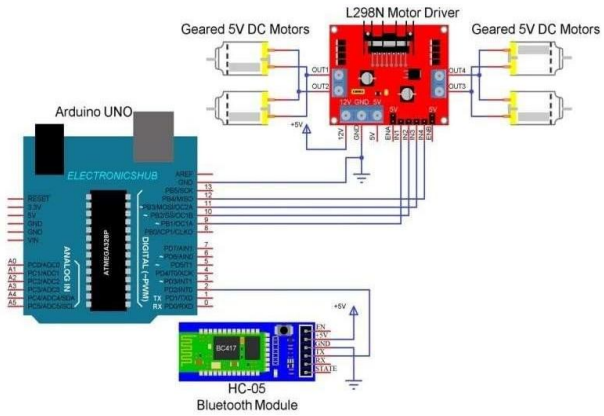

Figure 1. Circuit diagram[6]

Two DC batteries are needed. First battery of 5v dc is needed to power the Arduino board whereas the second battery of 6-12v dc supply is required to power the motor driver circuit. Once the entire circuit is ready, the Android Device need an application which sends the command to the Bluetooth Module connected with the Arduino. Arduino receives these commands and passes them to the Motor Driver from the digital I/O pins of the Arduino. The motor driver has 2 DC motor connected to its output terminals and it runs the 2 motors according to the commands sent by the Arduino. The motor driver can run a single motor or both the motor simultaneously in different direction which gives the user a benefit to run the motor in any direction.

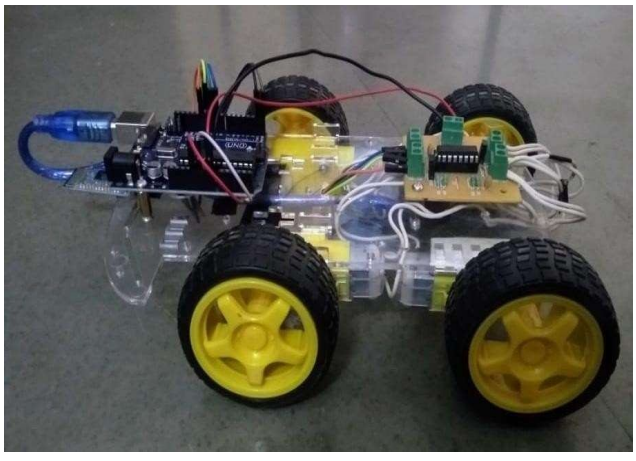

Figure 2. Actual View of the Project

IV. CONCLUSION

The Arduino micro-controller is an open source device that has been the brain for countless projects. Arduino

has everything that is needed by the project developer which includes its inbuilt converter, I/O pins etc. Thus, with the combination of Arduino and Bluetooth Shield we can control numerous other things, like home Lightings, Air conditioner and many more through our smart phones. Arduino can also contribute largely for the Smart- Home system. By doing this Project we discovered and learnt a lot about the Arduino, and how it has empowered us to easily convert digital signals into physical movements. An extra advantage of Arduino is that after a program is burned we don't need to worry about the program getting erased as long as it is not RESET. Arduino is also better than all other micro- controllers because of itsefficiency.

V. FUTURESCOPE

The Arduino platform has transformed what was once an expensive market for robotics and microprocessors and become the major platform thanks to its much lower cost and ease of use, resulting in higher volume and popularity, and community support behind it. Arduino has made it easy to program their circuit boards with the help of any computer via USB and simple to integrate with a wide range of sensors and devices to serve the desired purpose. Arduino is great for hobbyists, prototypers, and beginners who are just starting out in robotics because of its low cost and ease of use. It is simple to learn and educate people to be able to do basic tasks with the Arduino, yet it's good enough to execute fairly sophisticated tasks if you as a developer have the capability to take advantage of it. It is permitting people to develop projects inexpensively to build and control their own devices, like sensors that emit data to the Internet and control systems for all kinds of purposes. It is also minimizing the cost of development by permitting companies and organizations to develop prototypes much more quickly and with fairly less initial investment.

REFRENCES

[1] Mukesh Kumar Thakur, Ravi Shankar Kumar, Mohit Kumar, Raju Kumar ―Wireless Fingerprint Based Security System using Zigbee, International Journal of Inventive Engineering and Sciences (IJIES) ISSN: 2319-9598, Volume-1, Issue-5, April 2013.

[2] Annie P. Oommen1, Rahul A P2, Pranav V3, Ponni S4,Renjith Nadeshan5, Design and Implementation of a Digital CodeLock, International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering (An ISO 3297:2007 Certified Organization), Vol. 3, Issue 2, February2014.

[3] Himani Goyal, Wireless Display using RF- Module, International Journal of Inventive Engineering and Sciences (IJIES) ISSN: 2319 9598, Volume-3, Issue- 2, January 2015.

[4] Ujjwal Kumar, Deepak Rasaily, Priyanka Rana. ―Cell phone- Based Device Control with Voice Acknowledgement, International Journal of Engineering Trends and Technology (IJETT), ISSN: 2231-5381, Volume-32, Issue-5, February2016.

[5] Technology Intelligent Home: SMS Based Home Security System with Immediate Feedback International Journal Of Advance Research In Science And Engineering http://www.ijarse.com IJARSE, Vol. No.2, Issue No.5, May, 2013 ISSN-2319-8354(E).

[6] https://www.electronicshub.org/bluetooth-controlled-robot-using-arduino/