Wi-Fi Controlled Rover

[1]Bharath Kumar, [2]Rashmi Avinash Damle, [3]Sourav Sinha and [4]K. Saravanakumar,
[1,2,3]IV MCA , [4]Associate Professor,
[1,2,3,4]Department of Computer Science, Christ University, Bangalore, India

Abstract—A robot is a machine which isdesigned to perform one or more tasks simultaneously and frequently with speed and precision. It is a virtual artificial mediator, usually an electro-mechanical machine that is directed by a computer program to perform tasks based on electronic circuitry and functionality. Robots have replaced humans in performing repetitive and dangerous tasks which humans not prefer to do because of size limitations. Robots are designed to do the operations in extreme environments such as outer space, the bottom of the sea etc.,This paper gives a broad idea about designing a remotely controlled two-wheeled robotic rover over a Wi-Fi network by using an Arduino Uno connected to an ESP8266 Wi-Fi module.

Keywords—*Rover, Wi-fi; ESP8266; Arduino; DC Motor*

I. Introduction

Now a days technology plays a significant role in human life. Robotics has developed drastically over the years. This project designs a remotely controlled two-wheeled robotic rover over a Wi-Fi network, using an Arduino Uno connected to an ESP8266 Wi-Fi module and two stepper motors. The robot can be controlled from an ordinary internet browser, using a HTML designed interface. An Android smartphone is used to broadcast video and audio from the robot to operator's control interface. The rover car can be easily moved from one place to another just by a single device. Rover car can be used for security purpose with the installation of a camera. The end user can get the live video of where ever the rover is moving.

One of the major uses of robot is their flexibility and the ease with which they can be used in all places. This project particularly aims for those places where human involvement is not possible. In places such where there is a building collapsed or in case of fire this robot will be very useful. With this we can detect the exact location and condition of people stuck in the scrapes of the building. This robot can also be sent in sewage or water related application with some special motors being implemented.

II. Related Work

In 2016, S.R Madkar et al,.proposed a system to control robot controlled car using Wi-Fi module through android application of an android mobile phone [1] . This paper also shows how to control the appliances even in the absence of an android phone by sending a normal SMS. The advantage of using robot controlled car is that it can be used for various purposes like this project can be modified quite easily to include a spy camera as well that can stream the videos to the user over Wi-Fi. Attempts of using solar cells instead of the regular lithium-ion battery are also discussed here. This robot car can also be used to push the objects from one place to another. This paper also tells about enhancing with better Wi-Fi which would enable long distance communication**.**

In 2015, ManishaB.Bansode et al., proposed a system for controlling the rover through Android application [2]. The control of robot movement is developed in this study through the use of accelerometer. The controls are forward, backward, right and left motion. When any change occurs, the axis in the accelerometer will be sent to robot via Wi-Fi, then, the robot will move according to the changes of the value, and the axis is accepted.

In 2016, Subankar Roy et al., developed a rover which can be controlled through blueetooth [3]. The main aim of this paper was to provide simpler robot's hardware architecture with powerful computational platforms to enable robot designer to focus on the implementation and tests. This paper explains a very simple architecture for the robot which can further be used for various experimental courses. The advantage of low cost makes it more advantageous for students to use.

In 2015, Shoeb Maroof Shaikh et al., developed a Wireless Video Surveillance Robot, to help in security purpose [4]. Thispaper describes the implementation of the application for the mobile devices that run on Android operating system. It is controlled through the Bluetooth technology. This paper also discusses the use of the camera attached on the robot that transmits live video feed onto the designed android application using Wi-Fi technology. This application lets the robot control interactions with the help of GUI.

In 2015, Muhammad Gulfam et al., created a Surveillance Robot using socket programming [5]. This paper presents a way of controlling a surveillance robot using android mobile devices through socket programming. Socket is one of the major technologies of Computer Network programming.

III. Proposed System

The proposed system is implemented using microcontroller Arduino Uno. Disaster management is one such area where much attention is needed so that lot of lives can be saved. The proposed model uses a Wi-Fi module, ESP8266 along with an HTML interfacefor controlling the rover. The main advantage of this is that user can control the movement of the rover through the live video is seen on the webpage.
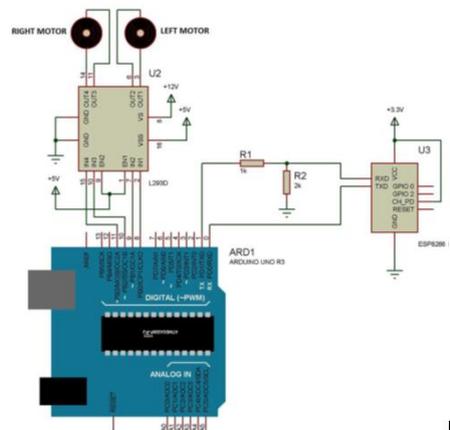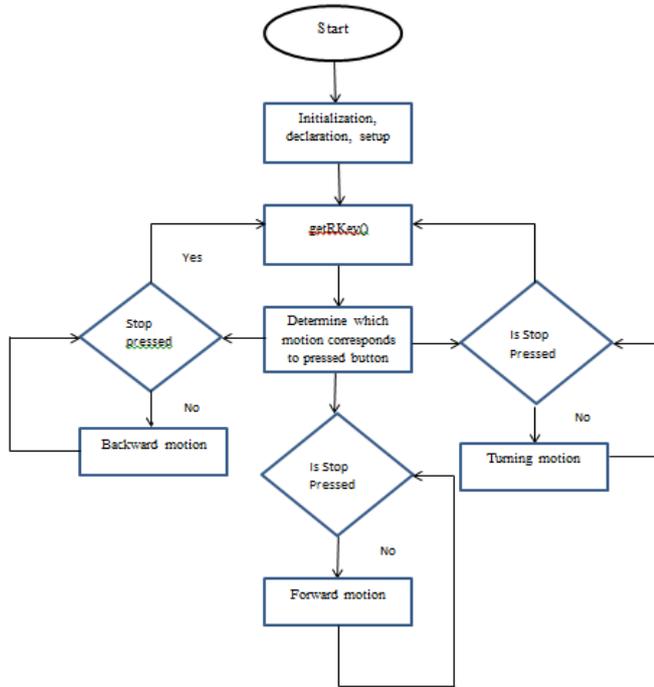

Figure 1: Block Diagram of the System

Figure 2: Flowchart of the System

IV. TEST RESULTS

The test results of the proposed system are shown below
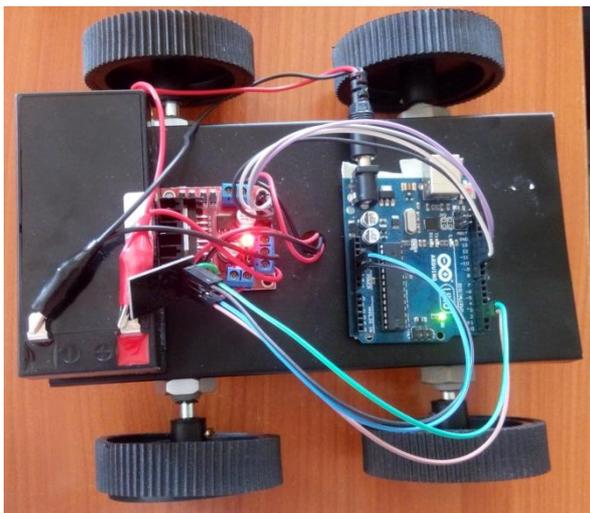

Figure 3: Interface for controlling the rover

Figure 4: Proposed System with, Arduino Uno, ESP8266

Figure 5: Interface for viewing live video

CONCLUSION

It is the need of the hour to help the people after disasters. When buildings collapse, situations arise where people are trapped inside the debris which is not located by the rescue teams. This rover will help in these situations by going inside those places of need and get information back about the disaster site, so that the rescue team can help the people who are trapped inside.

Acknowledgment

References

[1] S R. Madkar, Vipul Mehta, Nitin Bhuwania and Maitri Parida"Robot Controlled Car Using Wifi Module" IJRRAS, vol. 6, no. 5, 2016.

[2] Manisha B. Bansode and J.K Singh, "Android Mobile Controlled Wi-Fi Robot" IJARECE, vol. 4, no. 6, 2015.

[3] Subankar Roy, Tashi Rapden, Rajesh Bhat "Arduino Based Bluetooth Controlled Robot" IJETT,vol. 32, no 5, 2016

[4] Shoeb Maroof Shaikh, Khan Sufiyan , Mir Ibrahim and Kalpana Bodke "Wireless Video Surveilance Robot Controlled using Android Mobile Device"IJAFRSE, vol.1, no. 5, 2015.

[5] Muhammad Gulfam and Mirza Waleed Iftikhar Baig, "WG11 Android Based Surveillance Robot Control System Using Socket Programming with Implementation" International Journal of Multidisciplinary Sciences and Engineering, vol 6, no. 3, 2015