

IoT Based Gesture Controlled Robot

Prof. H. N. Patil¹, Rahul Santosh Tamhankar², Anup Pradip Pawar³, Dinanath Shamkant Patil⁴

Department of Electronics & Telecommunication Engineering
^{1,2,3,4} P.V.P.I.T., Savitribai Phule Pune University

Abstract- In these days, Robotic technology increasing at an alarming rate all over the world. And there are also various types of robots available in market. The robots are basically classified in 3 categories. Such as, Commercial, Industrial, Military applications. This project makes an attempt to develop a robot based on ATMEGA 8P microcontroller and operated using Raspberry Pi technology. The robot is a gesture controlled and IOT based system. This IOT system is used here for to operate robot from everywhere. An interfacing Raspberry Pi is also connected to the microcontroller to send the control signals to robot vehicle. The main objective of this project is to Spy and to access those places where man power is impossible, through gesture control technique it gives user or operator to ease of use of robot, using accelerometer sensor and IOT technology it is flexible to use.

Keywords- Raspberry Pi, Arduino, Flex sensor, WiFi, Gesture control, IoT

I. INTRODUCTION

The Global System for IOT based is the new and most popular and accepted standard for internet server in the world and it operates in web service. Over billion people use IOT service across the world. The utility of the IOT standard makes international connections very common between internets, enabling host to use their applications in many parts of the world. IOT differs significantly from its predecessors in both signaling and speech clarity, also video transmission as its channels is digitized. It means that the IOT system is now considered as higher efficient data transfer system. Here, we make an attempt to develop a robot based on ATMEGA microcontroller and operated using IOT technology. The robot is a gesture controlled and to operate it is use IOT system.

Many people in this world are known to gestures, a powerful communication medium amongst humans. They say actions speak louder than words. Communicating with gestures is a powerful method. Industrial as well as robots used for home purpose are often controlled by remote controllers. The use of gestures as a way to control can help a lot providing ease and can be more useful for the handicapped. Gestures provide a separate complementary modality to speech for expressing ones ideas. Furthermore, Image

processing is one of the most effective method used to process image signals. The main purpose of gesture recognition research is to identify a particular human gesture and convey information to the user pertaining to individual gesture. Sign language recognition from hand motions or postures is an active area in gesture recognition research for Human Computer Interaction (HCI). This paper aims to brief the practical approach of robotics through an effective method of image processing using gestures as a mode of control.

II. BLOCK DIAGRAM

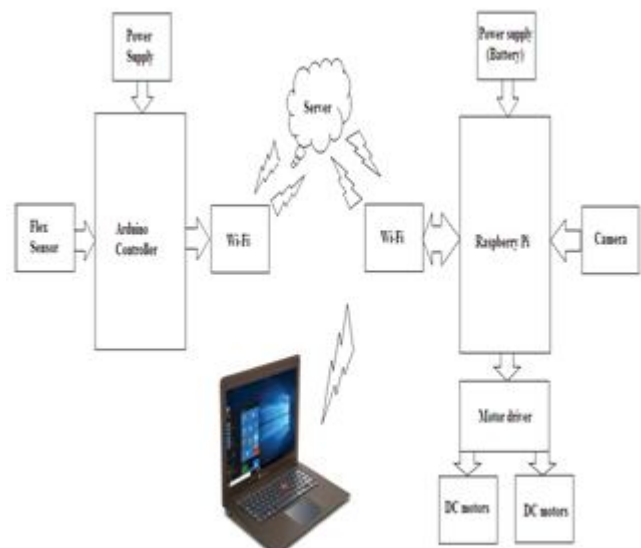


Fig.1 Block Diagram

This is the block diagram of proposed system. Basically the system is divided in two parts; one is transmitter i.e., handheld control module and other is receiver i.e., robotic device which is to be controlled. The control module consists of flex sensor, Arduino controller & Wi-Fi module. Arduino Controller is used to control all the processing. It controls and process input gestures given to the flex sensor and transmit these signals over the network through Wi-Fi module. While the robotic vehicle carries dc battery, raspberry pi, camera, dc motor driver & dc motors. Raspberry Pi is like a small CPU. It receives gesture control signals through Wi-Fi module transmitted by transmitter. Raspberry Pi controls camera and image capturing process and the working of DC motors through motor drivers.

III. CIRCUIT SIMULATIONS

This is the conceptual test circuit built to explain the working of bot. There are total three movements are given to the bot. The resistor R2 is potentiometer used instead of flex sensor.

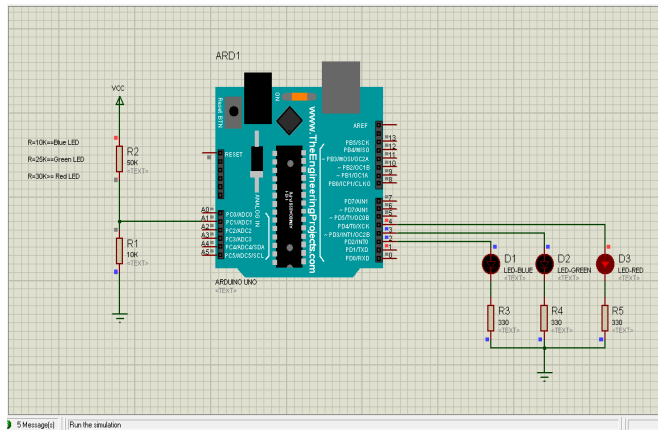


Fig. 2

When the value of R2 is greater than 30k red LED will glow as shown in above fig. 2, i.e., all motors of the robot vehicle are off hence, the robot is in steady state. There is no movement in any direction.

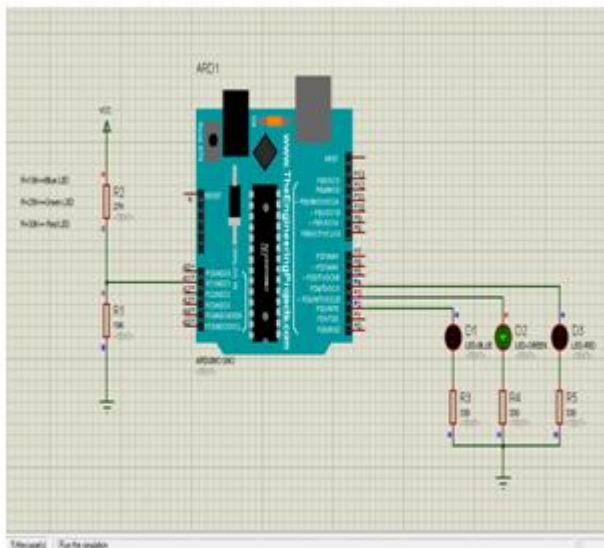


Fig. 3

When the value of R2 is in between 25k and 30k, the green LED will glow as shown in above fig. 3, i.e., all motors of the robot vehicle are start rotating in anticlockwise direction hence, the robot is start moving in forward direction. Similarly, when the value of R2 goes below 30k blue LED will glow i.e., only right side motors of the robot vehicle are

start rotating in anticlockwise direction and the left side motors are off therefore, the robot will take turn to left.

IV. CONCLUSION

This is a unique method of designing a robot which can be easily operate over hand motions of human hands. This device is an ultimate use all product for military as well as industrial purpose. By installing IoT in this robot it is very easy to access from anywhere, since it is based on IoT Technology. In future, there is no doubt, that all of the robots will be operate over IoT. In addition to the above features we can also add extra features like thumb/face recognition to ascertain more security of the vehicle. Also by adding GPS vehicle tracking increase the safety of vehicle.

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