

Gesture Controlled Vehicle System

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Abstract: This paper presents a Hand Gesture Controlled vehicle using Arduino and Lily pad, which can be controlled by simple hand gesture. According to the movement of the person hand, the Lily pad starts moves. It is based on 3-axis of accelerometer and vehicle moves in four directions forward, backward, left and right. For sensing human motion, we use an infrared sensor, its range is 800nm wavelength from human body. The main goal of this project is to control the movement of the vehicle with hand gesture using an accelerometer. This gesture vehicle is very useful for physically challenged people. In previously, the physically challenged people using their wheelchair movement by using joysticks. It creates more pressure and stress in their hands. By using this the movements are very easy for them to operate. In previous gesture devices we are using Arduino UNO. But here by using ARDUINO LILYPAD which senses minor movements in their hands. These wireless communications make the user to interact in a friendlier way.

Keywords: Arduino Lily pad, Bluetooth module, IC, Integrated Development Environment, HT12E, HT12D, RF, Transmitter.

1. Introduction

People would like to regulate everything with my hands! Sitting in my chair and dominant things sort of a BOSS. Thus, I finally came out with a hand gesture recognition automation, which might follow the commands created by hand gestures. Sounds crazy however I promise it's terribly easy. The automaton is split into 2 necessary elements, transmitter and receiver. Here we'd like to program the transmitter circuit. Thus, I will be able to be mistreatment Arduino because the programming platform. To sense the gestures created I will be able to be mistreatment by receiver in the vehicle. Let's see deep part operation of style of Hand Gesture Controlled automaton mistreatment Arduino Lily pad and let's see deep operation circuit operating of style of Hand Gesture Controlled automaton mistreatment Arduino Lily pad.

In this system, a gesture driven robotic vehicle is developed, in which how the vehicle is moving i.e., control and handling is depending on user gesture. This type of control is mostly used in virtual world computer games. This system makes the physically challenged user to operate the vehicle easily without the help of legs.

2. Literature survey

Different types of researches have been made by different

researchers in developing this type of project. However, they have a different application and have different technologies implemented. Some of those papers are mentioned below stating their technology and application.

[1] Pankaj presented a paper on gesture control movement by using micro controller. In this project work we have designed a robot which is to be controlled by hand gesture of human and an accelerometer is used to move robot according to hand movement. In this work the hardware requirements and complexity has been removed because of not using remote control.

[2] Pooja has proposed on gesture movement for physically impaired persons. In this work robot can directly contact with people, so we focused on the Manipulation and navigation in the environment and robotic system is used for finding the solution to the requirements

[3] Rafiqul Zaman has presented a paper in how AI and information technology play a key role in future advancement. In this paper a survey of recent hand gesture recognition systems is presented. Key issues of gesture recognition system are presented with challenges of gesture system. Review methods of recent postures and gestures recognition system presented as well. Summary of research results of hand gesture methods, databases, and comparison between main gesture recognition phases are also given. Advantages and drawbacks of the discussed systems are explained finally

[4] Vijaya Lakshmi has given a paper on gesture control by using Raspberry Pi. The main objective of this project is to create a hand gesture recognition robot, this robot can be used in both military i.e., in hostage situations which can reduce risk of damage to human life and even for physically handicapped i.e., in the form of wheel chair. This project mainly focuses on Raspberry Pi ARM-11 based processor utilization, image processing. Pi two motor driver circuits (L298) are used which can drive four DC motors combined.

[5] Purnim has discussed the use of gesture to control the overall performance of a smart city. This paper proposes a system to recognize the hand gestures of elderly people using an inexpensive Raspberry Pi. The system can detect six different gestures on both hands in various orientations. The experiment showed good results in detecting and classifying their meanings as linguistic descriptions.

[6] Siddharth has proposed on Human Computer Interaction techniques have become a bottleneck in the effective utilization of the available information flow. Naturalistic and intuitiveness of the hand gesture has been a great motivating factor for the researchers in the area of HCI to put their efforts to research and develop the more promising means of interaction between human and computers. This paper designs a system for gestural interaction between a user and a computer in dynamic environment.

[7] Prem Kumar has presented on the movement of a robot by using gesture movement of human. A wireless connection is used and helps to connect with robotics and parts of the body. This type is easy to control and use. Arduino Uno is used to Produce a robot commander. The inspector can help you enter a friendly way. We can also increase Productivity production.

3. Components

A. Hand gesture

A hand gesture is one form of communication in which the movement of the part of bodies especially a hand or head or face to express an idea or meaning. Hand Gestures differ from non-verbal communication which does not communicate some specific messages, like facial expressive displays, or displays of joint attention.

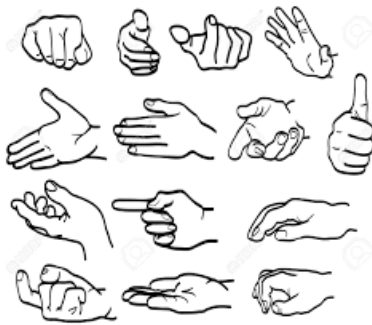


Fig. 1. Gesture signs

B. Arduino lily pad

Arduino Uno is that the microcontroller board supported the ATmega328p. there are many varieties of Arduino boards however here the sort of board is Arduino Lily pad, even this additionally planning to do an equivalent method however with some distinction, the distinction that is nothing however system voltage, clock speed, digital I/O, analog inputs and programming interface and additionally the price.

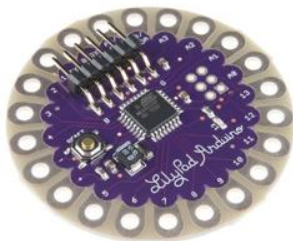


Fig. 2. Arduino lily pad

C. Bluetooth module HC-05

HC-05 is a Bluetooth module which is designed for wireless communication. This module can be used in a master or slave configuration. The HC-05 has two operating modes, one is the Data mode in which it can send and receive data from other Bluetooth devices and the other is the AT Command mode where the default device settings can be changed. We can operate the device in either of these two modes by using the key pin.



Fig. 3. Bluetooth module

D. Servo motors

Servomotors are a kind of electromechanical actuators that do not persistently become DC / AC motors. A **servo motor** is an electrical device which rotates an object when current is applied. It works on the principle of PULSE WIDTH MODULATION technique in which variation of current pulses makes the servomotor to rotate. It will make the vehicle to move.



Fig. 4. Servomotors

E. Arduino Nano

Arduino Nano is a small board similar to UNO it is based on AT mega 328p. it is more or less similar to other Arduino but in a separate way. In NANO IIC is used for TWI communication. AREF is to provide reference voltage for input voltage. it has an operating range of 5V. recommended input is 7-12V. It has a flash memory of 32kb.

F. Gyroscopic sensor

MPU-6050 is an 8 pin 6 axis gyro sensor. This kid works on I2C serial communication by default but it can be configured for SPI interface by configuring it register. SCA and SDA lines are present in this module for 12c. it is a multi-functioning sensor but for our project we are using only 12c mode.

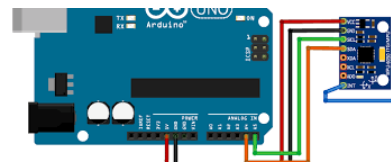


Fig. 5. Gyroscopic sensor

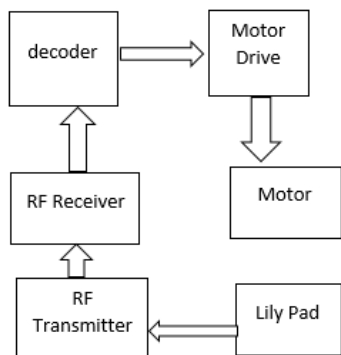


Fig. 6. Block diagram

4. Conclusion

Thus, in our project we have designed a gesture-controlled vehicle which works on our hand gesture. We have connected an Arduino lily pad in our hand which transmits the signal and it is received by the gyroscope sensor in the vehicle. Our project can be implemented in all vehicle

5. Result

we have seen that physically challenged people are facing many difficulties while travelling they need other’s help for their travel. But, by implementing our project to vehicles we can eradicate their difficulty and make their life a trouble free one.

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