GESTURE CONTROLLED CAR USING ADLX335 SENSOR AND ARDUINO UNO

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ABSTRACT

Project titled Gesture Controlled Robot Car using Adlx335 and Arduino uno, is a robot which can be control or managed by using simple gestures. Here we just needs to attach a gesture device in the hand which comprise a sensor called accelerometer(ADLX335). The sensor will collects the movement of the hand in a specified direction which will result in the movement or motion of the robot car in a specified way or direction. RF Transmitter device and accelerometer(ADLX335) are main lead for the motion or movement of the robot car. The robot car and the gesture devices are connected through wirelessly using radio waves(for navigation). The wireless communication gives the user or us to interact or manage the robot car in a more easy way. This robot can be operated sitting at one place.

I. INTRODUCTION

Recently, Many works are going on in the world to give a interaction between people and the machinery devices through simple gestures with wireless communication. Any Gestures gives an natural interface of both people and computer or machinery. Thus such gesture based interfaces are not only new to the interface devices but can also be utilized to extend their functions. The aim of gesture recognition in CSE field has always been the making the possible way for reduce the distances between people and machinery or computer based things. Various algorithms have been recommended to achieve the aim of gestures concedes and its use in transmitting to computer world. We shall now know more about what actually robot car and gestures are.

Robot car
A Robot car is a device which can be run wirelessly. The robot car uses sensors for collecting the gestures to act.

Gestures
A gesture is an action that performed for give a some knowledge that it has no effect

Problem statement
Now a days all the all the works are done by physically or manually or using some decvices that are not sufficient. So that here we can use the gestures for giving commands or inputs to the machine or computer to do action, So tha here we skip the heavy devices to carry.

Existing System
The main advantage of this system over other systems is that it provides real time hand gesture recognition, directong to an productive and natural way of controlling robot car. Additional advantage is that many existing system have used Bluetooth wireless control which is replaced by RF modules in this project, and due to which the range has been upgraded. Here we used accelerometer(ADLX335) sensor for controlling or managing the movement or motion of the robot car. When compared to other existing systems it is simple to build and is low-of-cost.

Proposed System
The system here mainly contains two parts transmitter part and receiver part. The transmitter portion consists of one 3-axis accelerometer(ADLX335) and one RF transmitter module and LM324 and HT12E.
ics. The receiver portion consists of one RF receiver module, one motor driver L293D, robot chesis and one Arduino uno. Here we require t separate 5V power supply which will be applied to both the parts. The arduino reads the program and the ADLX335 sensor reads the program and it gives the gesture sence for motion of the Robot Car in X,Y,Z directions. When we tilt our hand in ehich direction the robot car moves on that direction.

II. REQUIREMENTS SPECIFICATIONS

Software Specification:
In this project we are using Arduino IDE which is open source IDE developed by Arduino.cc it supports c++ embedded language. The Arduino IDE is supported by all operating systems (such as windows, mac OS, Linux) it is developed with java programming. The operating system used here is windows 10(64 bit).

Hardware Specification:
Arduino Uno
DC Motor
Accelerometer
Motor Driver L293D
RF pairs
RF Module
Prototyping PCB
Linear Regulator
HT12E(Encoder)and HT12D(Decoder)
Linear Regulator
USB cable
5 volt Batteries

ARDUINO UNO

Fig 2.1: Arduino Uno
Arduino Uno is a microcontroller board based on the ATmega328P. It has 14 input and output pins 6. in this we dump the code through usb cabel.
DC Motor

![Image of DC Motor]

**Fig 2.2: DC Motor**

DC motor is a one device where it gives the rotator motion. In our project it connected with two wheels for run the robot car. It takes the instructions by the motor driver and gives the action.

**Accelerometer**

![Image of Accelerometer]

An accelerometer (ADLX335) sensor which gives the x,y,z direction moments for the any rotator device. By using this device in our project we move our robot car with hand gesture.

**Motor Driver L293D**

![Image of Motor Driver L293D]

**Fig 2.4: Motor Driver L293D**

The motor Driver L293D is the one which gives the commands to the wheels to move in any directions at a time.
RF pairs

Fig 2.5: RF pairs

Here, RF transmitter transmits the signal which can be performed where as the RF receiver receives the signal from the rf transmitter and executes the task.

III. MODELING AND ANALYSIS

One gesture controlled Robot car is managed by hand moment used alternative for any other devices here we just need to tilt our hand in any directions to manage our robot car to move in any directions. A transmitter part is placed in our hand that consist adlx335 sensor, rf transmitter and lm 324 ic, that transmits the instructions to the robot car where the robot car moves according to that instructions these actions performed only by using hand gesture through ADLX335 sensor this ADLX335 sensor gives the x,y,z directions for moving robot car here we use LM324 ic as a comparator to give the exact instructions. Finally in which direction the hand tilts on that direction the robot car is moving on.

Transmission part:

In transmitter part it contains ADLX335 sensor, LM324 ic, HT12E ic and registers. In this part the ADLX335 sensor gives the instruction for which direction the robot car is move that is passed through LM324 comparator and the HT12E encoder will encodes the instruction and send through rf transmitter.

Fig 3.1 Circuit diagram of Transmission part
Receiver part:
In receiver part it contains Rf receiver, motor driver 293D, arduino uno, and HT12D ic. In this part it takes the encoded signals from the rf transmitter and decodes with HT12D decoder and sends the instructions to the motor driver 293D it analyses the instruction and gives the command to the wheels to move in any directions as the instruction says.

Fig 3.2 Circuit diagram of Receiver part

Fig 3.3 Flow chart
IV. RESULTS AND DECISIONS

Gesture controlled robot car moves according to in which direction we tilt our hand in the same direction the robot car also moves. When we tilt or turn our hand in right direction the robot car also turn right side and move in the right side only if we change the hand direction the root car also change the path and follow our hand tilting moment.

**Fig 4.1** Transmission part

**Fig 4.2** Receiver part
V. CONCLUSION

Hand gesture controlled robot car is the simple robot acr that moves with the simple hand tilt moment gestures. This is very useful in our day to day life because here we need not use any physical or heavy devices so it is the major use in this generation. In this we used ADLX335 accelerometer sensor for giving the input instruction to the robot car through x, y, z directions. Here we use rf waves so we sit one side and move or run the car.

Finally, it is a very useful and easy way to run or act the machinery device.

VI. REFERENCES

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