

A Survey Paper on Robotic Vehicle Controlled by Hand Gesture

Dipali Khilare¹ Manasi Shah² Gaurav Mohite³ S. N. Wangikar⁴

^{1,2,3,4}Department of Electronics & Telecommunication Engineering
^{1,2,3,4}DACOE, India

Abstract— This paper is presented on the basis of a model for hand motion control vehicles and it verifies the trends in technology, application, and usability. We present an integrated approach within the real-time detections; the gesture is supported the info that controls vehicle movement and moves on the gesture of the user hand movements. A three-axis accelerometer is an adaption done in today's technology. As the person moves their hand, the sensor also makes the movements. The gesture is capture by an accelerometer and processed by the gesture. Today human-machine interactions are moving away from mouse and pen and are becoming advanced. With each new day, the gap present between machines and humans is being reduced with the introduction of new technology for the easy standard of living. It's having the future scope of advanced robotic arms that are designed like the human hand itself can easily be controlled using hand gestures only. It also has a great chance for a handicapped people easily for their movement.

Keywords: Accelerometer ADXL335, RF Transmitter & Receiver(433MHz), microcontroller PIC 16F877, motor driver

I. INTRODUCTION

Human hand movements are sensed by the robot through sensors and it follows an equivalent. because the person moves their hand, the measuring instrument conjointly move consequently detector displaced and this detector senses the parameter according to the position of the hand. during this system, a gesture-driven process of robotic vehicle is developed, thus the vehicle action and handling i.e. handling and management believe the gesture of the user. In this system, the gesture is captured by the associate measuring system by software package particularly, the microcontroller software package and also the parameters square measure sent to the microcontroller and encoder circuit, it's more transmitted (transmitter section) by RF433 MHZ transmitter.

In the receiver section, the RF 433MHZ gainer holds the gained parameters and processes with the microcontroller and provides these parameters to the robotic vehicle thus it acts consistent with the gesture.

With this technique, it's possible to realize the processing of long-distance. this technique is knowingly developed to use within the medical field for nursing assistance to physicians and Surgeries.

A. Existing System

The modern emerging technology inside the area of science is Robotics. It is the new emerging booming field of first-rate use to people inside the coming years. These days several wireless robots are being developed and put to various applications and use. To enhance the contribution of the robot in our daily lives we need to find an effective way of communicating with robots.

For this purpose, there have been certain developments in the area of human-machine interaction. One common form of communication is Gestures that are not only limited to face, body, and fingers but also hand gestures.

B. Proposed System

We propose a project called as Robotic Vehicle Controlled by Hand Gesture" (RVCHG) automatic controlled by hand gesture system which provides the functionalities of moving vehicle, the robotic vehicle moves as we tilt our hand Front, Back, Left, right in motion the vehicle moves on the direction.

This work defines that the motion of the vehicle depends on the motion of the hand as we tilt the hand or move it in the direction is the Robotic Vehicle Controlled Using Hand Gesture (RVCHG) technology.

II. SYSTEM BLOCK DIAGRAM

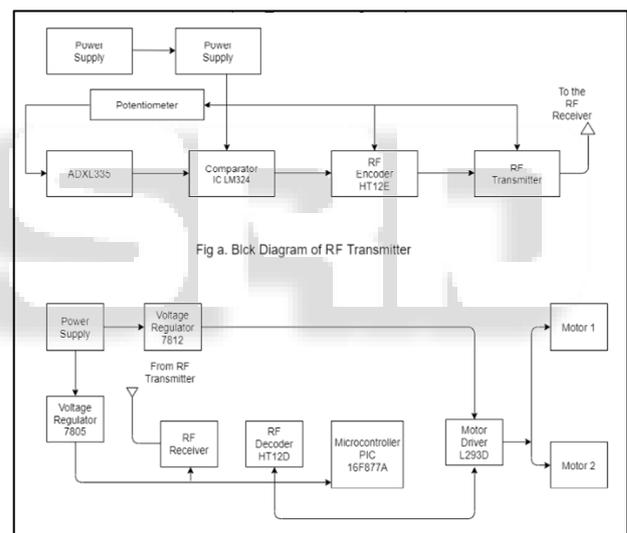


Fig. 1: Block Diagram of RF Receiver

III. MODULES

- Accelerometer ADXL335
- Potentiometer
- LM324 Comparator
- HT 12E Encoder
- RF Transmitter
- Voltage Regulator
- HT 12D Decoder
- PIC16F877A Microcontroller
- L293D Motor Driver
- RF Receiver

A. Module Description

1) Accelerometer ADXL335:

The ADXL335 is a small, thin, low strength 3-axis accelerometer that measures acceleration with a minimal full-scale variety of $\pm 3g$ at the site of the dimension of the

static acceleration of attractive force in tilt-sensing applications, as well as self-propelling acceleration because of motion, shock, or vibration. Tilting an accelerometer along its measured axis gives the attractive force relational to the amount of tilt.

2) Potentiometer:

A potentiometer is a 3-terminal electric circuit with a rotating contact that forms a changeable resistance. If only two terminals are used, one end and the contact, it works as a variable resistor or rheostat.

3) LM324 Comparator:

The LM324 comparative Circuit functioning and Applications. The LM324 in or ready for use amplifier IC may be laboured as a comparator. This a Low Power Quad Operational Amplifier and it as excessive stability, bandwidth which changed into designed to perform from a single power supply over a wide variety of voltages.

4) HT 12E Encoder:

The HT 12E get through ICs are a group of CMOSs LSIs for pushing down control system applications. They are capable of Encoding 12 bit of statistics which includes N deal with bits and 12-N data bits. Each deal with/statistics enters is externally trinary programmable if bonded out.

5) RF transmitter:

An RF transmitter receives serial facts and transmits it wirelessly through RF via its antenna related at pin4. The transmission takes place at the fee of 1Kbps – 10Kbps. The transmitted data is nonheritable by using an RF gainer running at the same frequency as that of the transmitter.

6) Voltage Regulator:

A voltage regulator is a tool designed to automatically preserve a constant voltage level. A voltage regulator might also use an easy feed-forward layout or can also encompass poor feedback. It can also use an electromechanical mechanism or digital components.

7) HT 12D Decoder

HT12D is a 212-collection decoder IC (Integrated Circuit) for remote management applications manufactured by way of Holtek. It is usually used for radio frequency (RF) wireless programs. By the usage of the paired HT12E encoder and HT12D decoder, we will transmit 12 bits of parallel facts serially. HT12D sincerely converts serial records to its input (can be obtained via RF receiver) to twelve-bit parallel facts. These 12-bit parallel data are divided into 8 address bits and 4 data bits. Using 8 address bits we can provide an 8-bit security code for 4-bit data and can be used to address multiple receivers by using the same transmitter.

8) PIC16F877A Microcontroller

The PIC microcontroller PIC16f877a is one in every of the maximum famed microcontrollers within the industry. This microcontroller may be very convenient to use, the coding or programming of this controller is also easier. One of the main blessings is that it can be write-erase as in many instances as viable because it makes use of FLASH memory technology. It has a total variety of forty pins and there are 33 pins for entering and output. PIC16F877A is used in lots of % microcontroller projects. PIC16F877A also has a whole lot of utility in virtual electronics circuits. PIC16F877A is used in many pic microcontroller projects.

PIC16F877A additionally have lots utility in virtual electronics circuits.

9) L293D Motor Driver

L293D is a normal Motor driver or Motor Driver IC which lets in DC motor to pressure in either direction. L293D is a 16-pin IC that can manipulate a set of DC motors simultaneously in any direction. It way that you may control two DC motor with an unmarried L293D IC. Dual H-bridge Motor Driver integrated circuit (IC).

10) RF Receiver

The gainer part consists of 433MHz RF receiver module (RX1), HT12D decoder (IC5) and L293D motor driver Integrated Circuits 6 to run the motors. Here, the receiver module RX1 receives the transmitted signal, it truly is decoded with the useful resource of decoder IC to get the same virtual outputs. Four outputs of IC6 pressure two motors. The robotic moves as per the tilt direction of the accelerometer in the transmitter. The path of the robotic movement is as consistent with common sense listed.

IV. CONCLUSION

In this, we added a hand-gesture-based totally interface for navigating a car-robot. A user can manage a car-robotic at once by the usage of his or her hand trajectories. In the future, we are able to immediately use a cell smartphone with an accelerometer to manipulate a car-robot. We also need to add more hand gestures (inclusive of the curve and slash) into the interface to control the auto in a greater herbal and effectively way.

Transmission via RF (Radiofrequency) is better than IR (infrared) due to many reasons. Firstly, indicators through RF can travel through large distances making it suitable for long-range applications. Also, while IR by way of and big operates in line of sight mode, RF signs can adventure even when there may be an obstruction among transmitter & receiver.

Next, RF transmission is stronger and more reliable than IR transmission. RF communication makes use of a particular frequency, not like IR signals which might be suffering from different IR emitting sources. This RF module contains an RF Transmitter and an RF Receiver. The sender/receiver (TX/RX) both operates at a frequency of 433MHz and therefore the RF transmitter gains serial records and sends it wirelessly through RF through its antenna connected. The transmitted statistics are received through an RF receiver operating at the same frequency as that of the transmitted.

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