

Gesture Control Life Guard Robot Using Microcontroller

T. Gopu, G. Vishnu, I. Sam Benjamin, N. Amarnath, S. R. Vignesh

K. L. N. College of Engineering, Pottapalayam-India.
gopu70@gmail.com, vishnusenithil2000@gmail.com, sambenjamin159357@gmail.com,
amarnathioc55@gmail.com, vigneshsr793@gmail.com.

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ABSTRACT

Background

Gesture Control Life Guard Robot which will get back the human when fall in the sea to the sea shore controlled by the another man at the sea shore. The gesture control will reduce the complexity of the transmitter side. If any people at the sea shore can able to access the life guard robot to save the human life.

Transmitter Side

ADXL335 can measures of x and y according to the hand gesture and send values to Ardino nano through wireless communication using NRF24L01 Transceiver module.

Receiver Side

Receives data through wireless communication using NRF24L01 to L298N motor driver. Arduino nano controls the motors through L298N motor drive and motors operate in respective ways

Objective

Life saver -saving life of human who fall in to the sea / lake /ocean / swimming pool/ amusement park.

Gesture control– gesture control technology to reduce the complexity of transmitter side

Methods

Method used in our project is gesture control and wireless communication between two microcontroller

Result

We have successfully done our project after facing many failures. By applying trial and error method we finish our project

Conclusion

By implementing our innovation in real time. No one will lose their life when they fell in the ocean. Our innovation can be implemented in the any places like sea, river, lake, swimming pool and amusement park. We have a new controlling technology in our innovation to make an easy control in the receiver side.

Keywords: Adxl335 sensor, nrf24l01 transceiver, l298n motor driver, wireless communication.

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INTRODUCTION

Human life is most valuable thing in the world. We can't bring back the human life if we lost. But we can save their life when they fall in sea / lake /ocean / swimming pool/ amusement park by our project. gesture control technology to reduce the complexity of transmitter side. For wireless communication

NRF24L01 is used as transmitter and receiver module. NRF24L01 use SPI (serial peripheral interface) to communicate wirelessly between two microcontroller. The wireless transmission and receiving range is 430m radius and 860m diameter. We use accelerometer sensor for gesture recognition. Gesture Control Life Guard Robot which will get back the human when fall in the sea to the sea shore controlled by the another man at the sea shore. The gesture control will reduce the complexity of the transmitter side. If any people at the sea shore can able to access the life guard robot to save the human life. This project consists of Transmitter and Receiver side .Transmitter side consists of ADXL335 sensor and NRF24L01 transceiver which is placed on a right hand glove . Receiver side consists of Arduino nano microcontroller, NRF24L01 transceiver L298N motor drive, 2 permanent magnet dc motors with 2 propeller.

Background

The Gesture Control Life Guard Robot which will get back the human when fall in the sea to the sea shore controlled by the another man at the sea shore. The gesture control will reduce the complexity of the transmitter side. If any people at the sea shore can able to access the life guard robot to save the human life

Objective

Life saver -saving life of human who fall in to the sea / lake /ocean / swimming pool/ amusement park.
Gesture control– gesture control technology to reduce the complexity of transmitter side

LITERATURE REVIEW

Background Theory

This paper “Design and Implementation of a Hand Movement Controlled Robotic Vehicle with Wireless Live Streaming Feature” tells about the design and implementation of a robot vehicle that can be controlled from all directions by using the hand gesture movement with a wifi camera that is fixed at the top of the robot to wireless streaming to the user end.

This paper “An Experiment With NRF24L01+ and Arduino Pro Micro Data Transmission for IoT” presents the results obtained during an experiment with a project in which it was considered a structure model developed to attend a part of a project to IC and sensors, the contribution of this study provides a theoretical reference for researchers to use in more projects, in which there is a need to transmit and receive data between microcontrollers in different locations.

Previous Studies

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METHODOLOGY

Gesture Control Life Guard Robot which will get back the human when fall in the sea to the sea shore controlled by the another man at the sea shore. The gesture control will reduce the complexity of the transmitter side. If any people at the sea shore can able to access the life guard robot to save the human life. This project consists of Transmitter and Receiver side .Transmitter side consists of ADXL335 sensor and NRF24L01 transceiver which is placed on a right hand glove . Receiver side consists of Arduino nano microcontroller , NRF24L01 transceiver L298N motor drive , 2 permanent magnet dc motors with 2 propeller. The ADXL 335 accelerometer sensor collects data from hand gesture of the human and sent to the Arduino nano microcontroller.

Data

The data used in this project is TX_ADDR = 0x65646f4e31 for interfacing two NRF24L01 Transceiver modules. The x axis and y axis data for the hand gesture control. The data used in this project are listed in the table below

Table 1: Data Used in the Project

Movement of the robot	X- Axis value	Y – Axis value
Forward	< 80	-
Backward	>155	-
Right	-	>145
Left	-	<80

Model Development

Working of our project is when a man fell in the river, ocean, swimming pool the another man at the safer side can control the prototype through gesture control. Through wireless communication using NRF24L01 transceiver module the data transmitted and received in the principle of SPI. The prototype moves according to the hand movement by the high torque motor the man can be bring back to the safer side

Step 1:

Start the process

Step 2:

Accelerometer sensor measure the hand gesture and send data to the Arduino nano

Step 3:

Check if the sensor measurement y axis >400, The two motor rotates clockwise to move forward

Check if the sensor measurement y axis <320, The two motor rotates anticlockwise to move backward

Check if the sensor measurement x axis >400, The motor which is in right side stops rotate and another motor which is in left side rotates clockwise to turn right.

Check if the sensor measurement y axis >340, The motor which is in left side stops rotate and another motor which is in right side rotates clockwise to turn left.

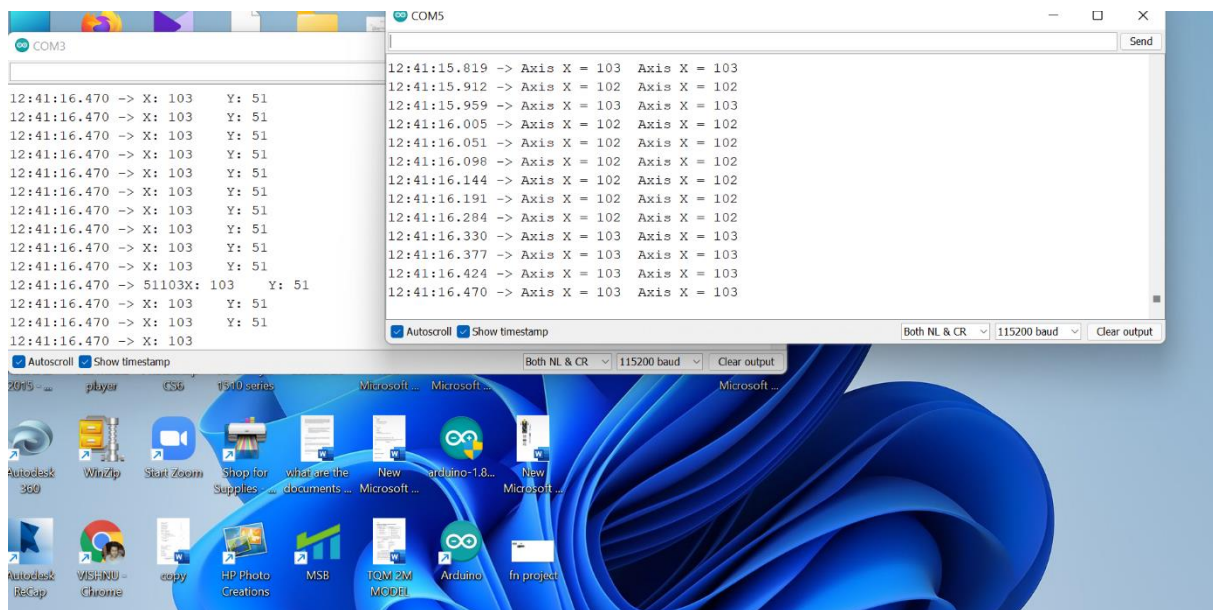
Step 4:

If accelerometer measurement not equal to the above condition , the motor stops rotates

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DATA ANALYSIS AND RESULTS

Results





These pictures are the result of our project. The first picture represent the x and y axis value transmitted and received by the microcontroller. The second and third pictures represent the prototype in different view.

Robustness Test

We have done a robustness test to ensure the performance of our project. All the time of testing our project give the same result.

Analysis

We analyzed that we have to do the project step by step. The interfacing must be done in the NRF24L01 module by using the TX address. The calibration of the MPU6050 should be done by measuring the x and y axis.

CONCLUSION AND RECOMMENDATIONS

By implementing our innovation in real time. No one will lose their life when they fell in the ocean. Our innovation can be implemented in the any places like sea, river, lake, swimming pool and amusement park. We have a new controlling technology in our innovation to make an easy control in the receiver side. We have successfully completed our own innovation.

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Dr. A.V. Ramprasad Principal
Advisor

Dr. S.M. Kannan prof/EEE
Advisor

Dr. M. Ganesh Kumari prof/EEE
Advisor

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BIOGRAPHY



Mr. T.Gopu prof/EEE
Guide for this project.



Mr. G.Vishnu B.E (EEE)
Project Team Leader.



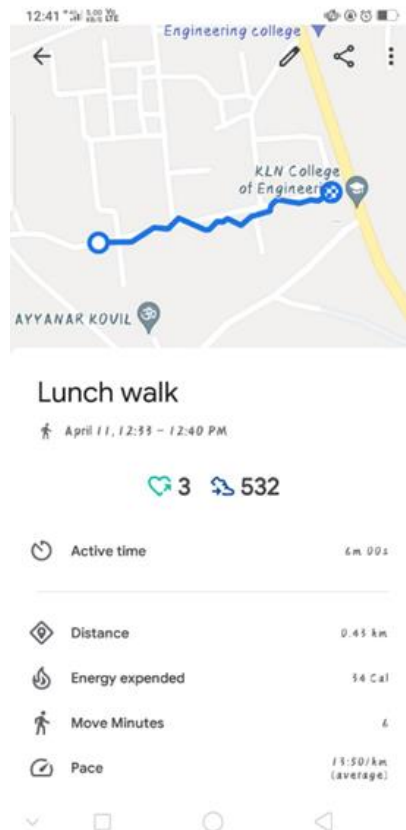
Mr. S.R.Vignesh B.E(EEE)
Assistant Project Team Leader



Mr. I.Sam Benjamin B.E(EEE)
Team Member

APPENDICES

Appendix 1



Measurement of range of nrf24l01 transceiver module. The range is upto 430 m radius and 860 m diameter.