IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 8, June 2022
Impact Factor: 6.252

Smart Hand Gesture Wheel Chair

Prof. U. J. Suryawanshi[1], Shivani P. Nale[2], Neha Bhagade[3]
Assistant Professor, Department of EXTC, NBN SSOE, Pune, India[1]
UG Student, Department of EXTC, NBN SSOE, Pune, India[2,3]

Abstract: *This Project is to develop a wheelchair control that is useful to the physically disabled person with his hand movement or his hand gesture recognition using Acceleration technology. Tremendous leaps have been made in the field of wheelchair technology. However, even these significant advances haven't been able to help quadriplegics navigate wheelchairs unassisted. It a wheelchair that can be controlled by simple hand gestures.*

Keywords: Microcontroller (AVR)**,** Accelerometer (adxl 345), IR Sensor, DHT 11, etc.

I. INTRODUCTION

This project is to develop a wheelchair control that is useful to the physically disabled person with his hand movement or his hand gesture recognition using Acceleration technology. Tremendous leaps have been made in the field of wheelchair technology. However, even these significant advances haven't been able to help quadriplegics navigate wheelchairs unassisted. It is a wheelchair that can be controlled by simple hand gestures. It employs a sensor that controlsthe wheelchair hand gestures made by the user and interprets the motion intended by the user and moves accordingly. IN Acceleration we have an Acceleration sensor. When we change the direction, the sensor registers values are changed and those values are given to the microcontroller. Depending on the direction of the Acceleration, the microcontroller controlsthe wheelchair directions like LEFT, RIGHT, FRONT, and BACK.

II. LITERATURE SURVEY

The unfortunate event affects the motor capacity of a person, it is necessary to use devices like wheelchairs that offer a means of displacement for patients with motor problems in the lower limbs. Tremendous leaps have been made in the field of wheelchair technology. However, even though these significant advances haven't been able to help quadriplegics navigate a wheelchair unfortunate event affects the motor capacity of a person, it is necessary to use devices like wheelchairs that offer a means of displacement for patients with motor problems of the lower limbs.

Tremendous leaps have been made in the field of wheelchair technology. However, even these significant advances haven't been able to help quadriplegics navigate wheelchairs unassisted. Some patients that cannot manipulate the wheelchair with their arms due to a lack of force or psychomotor problems in the superior members, request electric wheelchairs, frequently manipulated with joysticks; however, the joystick manipulation is even not practical and frequently it must be handled with the mouth.

III. PROPOSED METHODOLOGY

This project proposes an integrated approach to real-time detection, tracking, and direction recognition of hands, which is intended to be used as a human-robot interaction interface for the intelligent wheelchair. This project is to demonstrate that accelerometers can be used to effectively translate finger and hand gestures into computer-interpreted signals. For gesture recognition, the accelerometer data is calibrated and filtered. The accelerometers can measure the magnitude and direction of gravity in addition to movement-induced acceleration.

To calibrate the accelerometers, we rotate the device sensitive axis concerning gravity and use the resultant signal as an absolute measurement. Integrating a single-chip wireless solution with a MEMS accelerometer would yield an autonomous device small enough to apply to the fingernails, because of their small size and weight.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 8, June 2022
Impact Factor: 6.252

Accelerometers are attached to the fingertips and back of the hand. Arrows on the hand show the location of accelerometers and their sensitive directions, that the sensitive direction of the accelerometer is in the plane of the hand. The gesture-based wheelchair is suitable for the elderly and the physically challenged people who are unfortunate to have lost ability in their limbs due to paralysis or by birth or by old age.

IV. PROPOSED SET UP

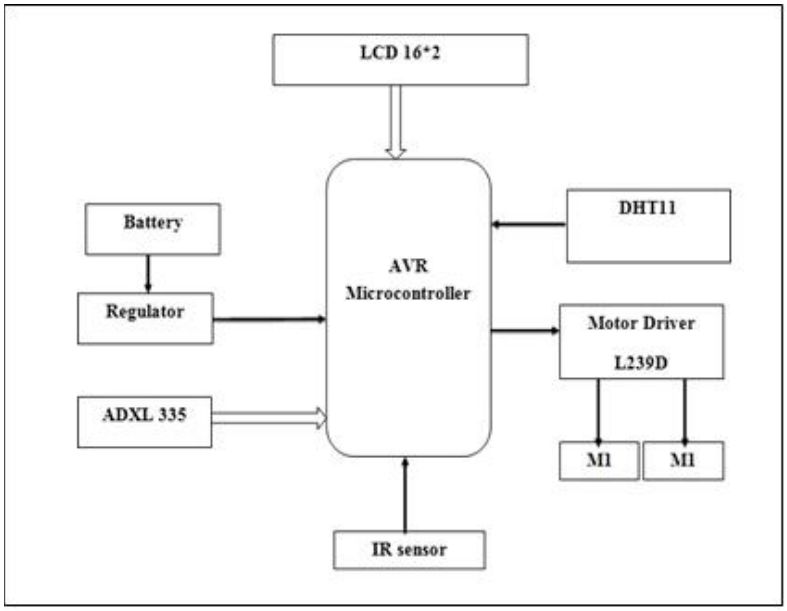

Figure 1.1: Block Diagram of Wheel Chair

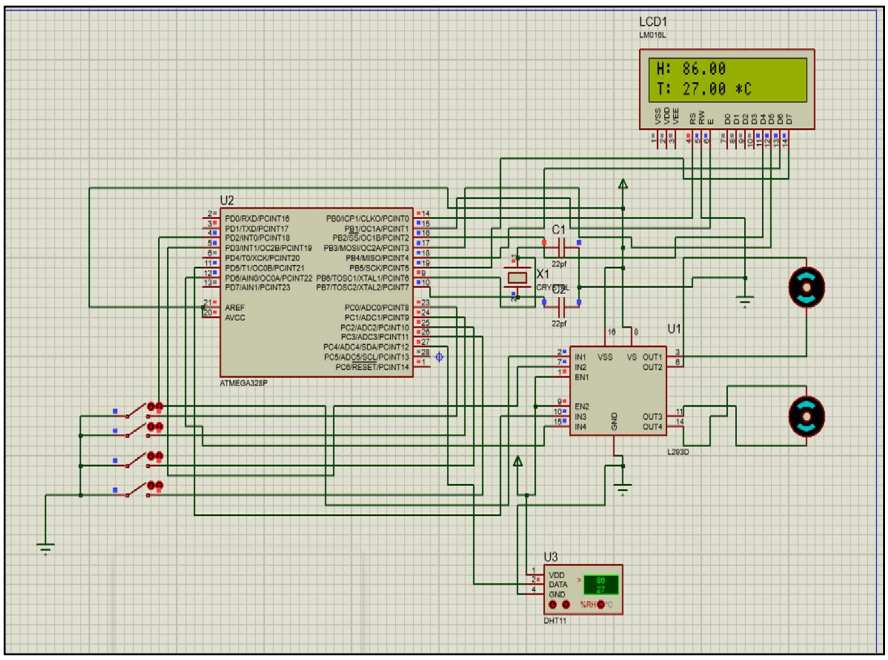

Figure 2: Structure of Software

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 8, June 2022
Impact Factor: 6.252

Hardware Specifications

Microcontroller (AVR)
Accelerometer (adxl 345)
Battery (12v)
IR Sensor
LCD Display 16*2
DHT 11

Software Specification:

Arduino IDE (Programming)
Express PCB (Circuit & Layout Design)

Features of the proposed set up

Small Weight of the wheelchair.
Small transport volume of the foldable or dise-semblable wheelchair.
Comfortable utilization.
Without any external help the paralysed person can operate his chair.
The prototype of the system is successfully developed to move the wheelchair's Left, Right, Forward, andBackward directions or stay in the same position.
Highly resistant materials (Costs).

Low cross-sectional and longitudinal system stability during static and dynamic movement conditions. A Large number of moving pairs in foldable wheelchairs. More difficult handling of a monolith frame duringself-loading into a car. Body pressed into the frame of a standard wheelchair with only a small side space.

V. CONCLUSIONS

Integrating features of all the hardware components used have been developed in it. The presence of every module has been reasoned out and placed carefully, thus contributing to the best working of the unit. Secondly, using highly advanced ICs with the help of growing technology, the project has been successfully implemented. Thus, the project has been successfully designed and tested.

ACKNOWLEDGMENT

I am thankful to Prof. U.J. Suryavanshi Project Guide, for their cooperation and suggestions. She has made valuable suggestions and given guidance throughout completing my project work. I wish to express deep heartfelt thanks to my guide and Head of the Department, Dr. Makarand M. Jadhav, for giving valuable guidance and direction to my project work. He patiently provided encouragement and motivation. His comments and precious suggestions made the entire journey to the final accomplishment of this work pleasant. I would like to thank Dr. Shivprasad P. Patil, Principal, NBN Sinhgad School of Engineering, Pune for providing excellent facilities in the college to carry out this project work.I wish to thank all the faculty and staff members of the department for their sincere co-operation, kind blessings, and warm well-wishes.

REFERENCES

[1] "A Wearable Head-Mounted Sensor-Based Apparatus for Eye Tracking Applications" IEEE International Conference on Virtual Environments, Human-Computer Interfaces, and Measurement Systems Istanbul, Turkey, dated 14-16 July 2008.
[2] "A Wearable Head-Mounted Sensor-Based Apparatus for Eye Tracking Applications" IEEE International Conference on Virtual Environments, Human-Computer Interfaces, and Measurement Systems Istanbul, Turkey, dated 14-16 July 2008.
[3] Marhic, B. "Robotic assistance: an automatic wheelchair tracking "Intelligent Robots and Systems, 2005. (IROS2005). 2005 IEEE/RSJ.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 8, June 2022
Impact Factor: 6.252

[4] Gaurav Kumar Soni, Vidhata Poddar, Yogita Sahu, Pratima Suryawanshi, "Hand Gesture Recognition Based Wheel Chair Direction Control Using AVR Microcontroller", International Journal of Advanced Research in Computer and Communication Engineering Vol. 5, Issue 3, March 2016.