



iJRASET

International Journal For Research in
Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 5 Issue: III Month of publication: March 2017

DOI: <http://doi.org/10.22214/ijraset.2017.3206>

www.ijraset.com

Call:  08813907089

E-mail ID: ijraset@gmail.com

Sensor Based Eye Controlled Automated Wheelchair

Ms. Kale Taibai D.¹, Ms. Patil Aishwarya S.², Ms. Kamble Madhuri H.³, Prof. S. A. Jagtap⁴
^{1,2,3}Student, B.E. (Electronics), ⁴Associate Prof., Electronics Dept.
PES, C. O. E. Phaltan

Abstract: the project discuss about a wheel chair based on eye gesture and hand gestures. This project is help to those people who are not able doing any moment due to their illness, injury, or disability. They can move the wheel chair left or right by just looking to the required direction, they can also start and stop the wheel chair, with other eye and hand gestures.

Keywords: wheelchair, eye blinking sensor, ultrasonic sensor, accelerometer, microcontroller basic board.

I. INTRODUCTION

This project proposes Associate in nursing integrated approach to real time detection, following and direction recognition of eyes that is meant to be used as a human-robot interaction interface for the intelligent chair. Intelligent wheelchairs are being developed for a protracted time to support unfit folks with many incapacity levels. In several cases, the attention muscles of unfit folks square measure one in every of the few manageable muscles that also operate well. Therefore, victimization the eye-gaze as Associate in nursing interface for unfit or physically disabled folks has been of interest [1].

This project facilitate fulfils useful } for unfit patients to maneuver anyplace while not others help. During this project, there'll be a wheel chair model as a golem model, which can contain Associate in nursing in-built small CONTROLLER. The chair is created in such how that it will move freely with none external support or dependency. A Micro-controller can act as a master controller for the movement of the automatic chair. it's chargeable for all the choices taken by the automotive vehicle matedchair.[10] Eye blinking sensing element: This sensor is employed to sense the movement of the attention and converts it into digital knowledge and transfers it to the Master controller. Today's technology is quick shifting towards automation that minimizes the necessity for human intervention. Those mechanization-cum-human operators with the help of machinery need muscular work whereas automation greatly reduces the necessity for not solely human sensory however additionally mental needs still. Thus, the current day automatic systems have less manual operations, a lot of flexibility, dependability and high accuracy. Attributable to this demand, each field prefers automatic management systems. Especially within the field of physical science automatic systems as they're giving reliable performance

II. BLOCK DIAGRAM

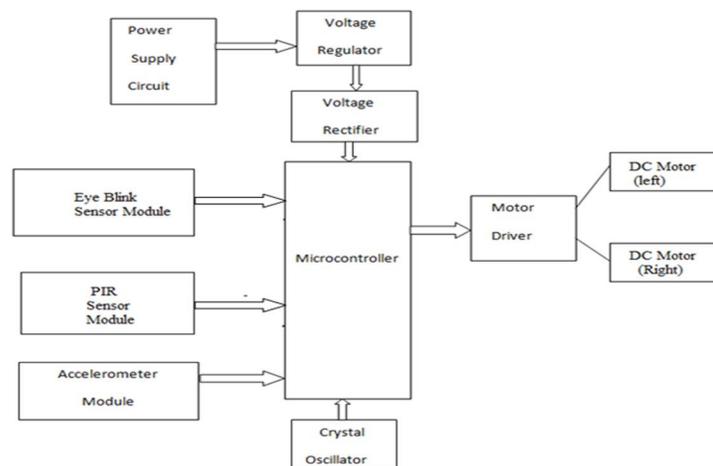


Fig1: diagram of sensing element based mostly Eye Controlled machine-controlled chair

International Journal for Research in Applied Science & Engineering Technology (IJRASET)

.In this automated wheelchair mainly consisting of 3 types of modules: first one is the sensor module, second one is control module and third one is the motor driver. The sensors will sense the eyeball rotation send the values to control module. Direction of wheelchair is given through control module. Another three sensors take the position of the wheelchair and send it to control module. Control module converts analog data into digital and send the values to dc motor driver.

In this proposed model AT89C51 Microcontroller is master controller.32 Programmable I/O Line, 128 x 8-bit Internal RAM , Low-power Idle and Power-down Modes, Two 16-bit Timer/Counters, Full Duplex UART Serial.

This proposed system starts with the detection of the eye blink sensor and accelerometer sensor position. In order to detect the position of the eye we use the eye blink sensor (IR sensor). The values generated by the sensor depending on the position of the eye are signal routed to the microcontroller..

A. Eye Blink Sensor

This Eye Blink sensor is IR based, According to the eye blink variation across eye will be vary. Output is high when the eye is closed otherwise output is low. This generated output is given to the logic circuit to indicate alarm. This can be used to controlling accident due to unconscious through Eye blink.



Fig2: Eye blinking sensor

B. PIR Sensor

All PIR sensors discover changes in infra-red radiation, within the sort of heat emitted by variety of bodies together with folks, cars and, to a lesser extent, dogs or alternative little animals. The lot of infra-red radiation is emitted once the larger the body and it's easier for a PIR sensing element to discover. The area in field of read changes in infra-red radiation may be detected. the sector of read will alter with changes in temperature and also the size of the warmth supply.

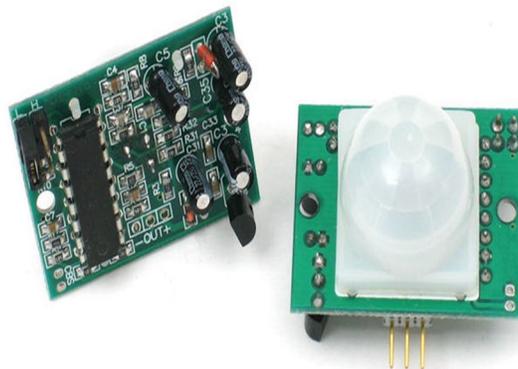


Fig3: PIR Sensor

International Journal for Research in Applied Science & Engineering Technology (IJRASET)

C. Accelerometer

The ADXL335 could be a complete 3-axis acceleration measure system. The ADXL335 features a measure vary of $\pm 3g$ mini-mum. It contains a polysilicon surface-micro machined sensing element associate degreed signal learning electronic equipment to implement an open-loop acceleration measure design. The output signals area unit analog voltages that area unit proportional to acceleration. The measuring system will live the static acceleration of gravity in tilt-sensing applications furthermore as dynamic acceleration ensuing from motion, shock, or vibration.

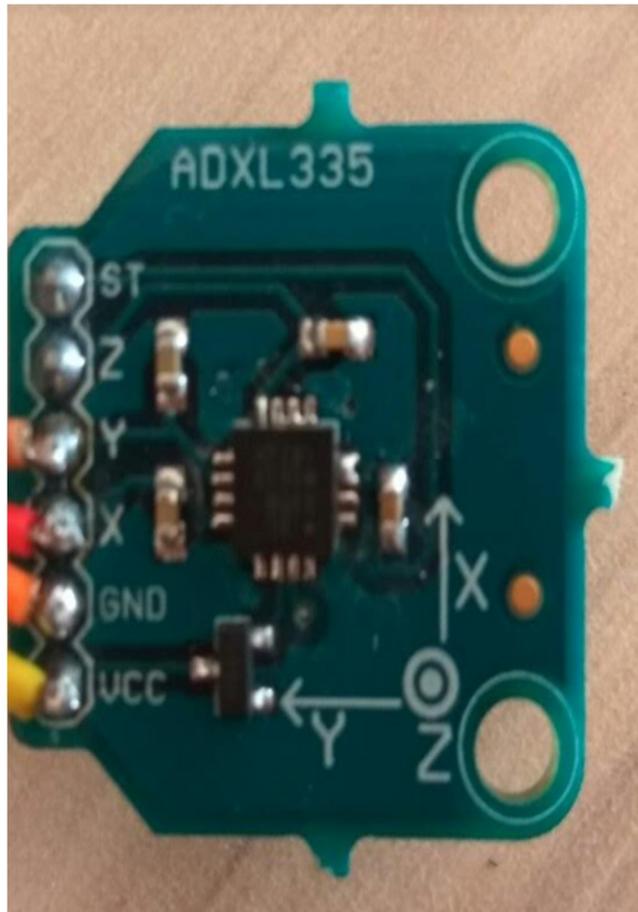


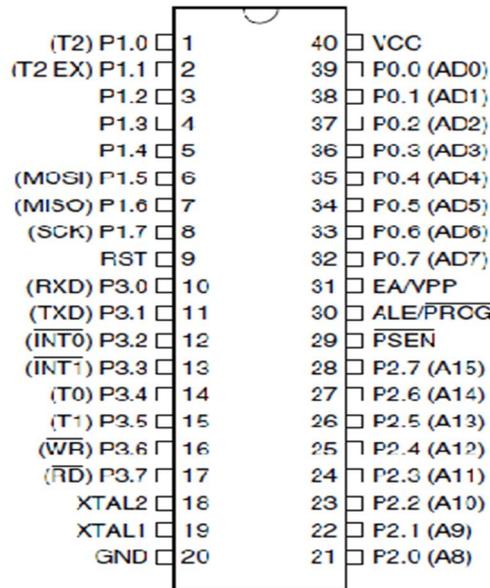
Fig4: Accelerometer

D. Microcontroller

The AT89S51 could be a low-power, superior CMOS 8-bit microcontroller with 4K bytes of In-System Programmable non-volatile storage. The device is factory-made exploitation Atmel's high-density nonvolatilizable memory technology and is compatible with the indus-try-standard 80C51 instruction set and pin out. The on-chip Flash permits the program memory to be reprogrammed in-system or by a standard nonvolatilizable memory pro-grammar. By combining a flexible 8-bit mainframe with In-System Programmable Flash on a monolithic chip, the Atmel AT89S51 could be a powerful microcontroller that provides a highly-flexible and cost-efficient answer to several embedded management applications. The AT89S51 provides the subsequent commonplace features: 4K bytes of Flash, 128 bytes of RAM, thirty two I/O lines, Watchdog timer, 2 knowledge pointers, 2 16-bit timer/counters, a five-vector two-level interrupt design, a full duplex port, on-chip generator, and clock electronic equipment. additionally, the AT89S51 is meant with static logic for operation right down to zero frequency and supports 2 software system selectable power saving modes. The Idle Mode stops the mainframe whereas permitting the RAM, timer/counters, port, and interrupt system to continue functioning. The Power-down mode saves the RAM con-tents however freezes the generator, disabling all alternative chip functions till consequent external interrupt or hardware reset.

International Journal for Research in Applied Science & Engineering Technology (IJRASET)

1) Pin Diagram of 8051:



E. D.C. Motor

Electrical energy is needed for DC motor to provide energy, through the interaction of magnetic fields and current-carrying conductors. The alternating technique for making power from energy, is achieved by associate degree generator, generator or generator. Differing types of electrical motors may be run as generators, and contrariwise. DC motor input is current/voltage and force (speed) could be a output. The two half of } DC motor: the rotating half referred to assist named is termed } because the coil and the stationary part that contains wire coil called the sector coils. The stationary half is additionally referred to as the stator coil. The coil is fabricated of coils of wire enclosed round the core, and also the extended shaft rotates on bearings. you ought to additionally heed that the finishes of every coil of wire on the coil area unit terminated at one end of the coil. The termination points area unit referred to as the commutator, and this is often wherever the brushes build tangency to bring electrical current from the stationary half to the revolving a part of the machine.



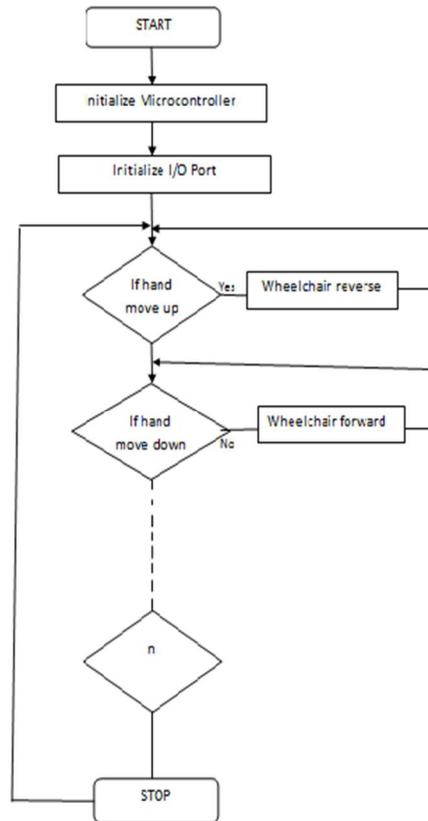
Fig5: DC motor:

F. L293

To drive DC motor on either direction L293D motor driver or motor driver IC is employed. It will manage 2 Dc motors at the same time in any direction. This means we are able to manage 2 DC motor with one L293D IC

International Journal for Research in Applied Science & Engineering Technology (IJRASET)

III. FLOW CHART



IV. FUTURE SCOPE

To form the system a lot of move with patient we've got to feature some further sensors. supported the results obtained we have a tendency to conclude that the hand movement response towards traditional subjects and paralytic patients is extremely outstanding and offers a good vary of movements. Therefore the wheel chair moves all told needed directions with smart response.

V. OBJECTIVE

The paper discuss a few wheel chair supported eye and hand gesture. This project is created to assist the folks with nerve downside. Though paralytic, this project can facilitate them to maneuver an electrical wheel chair with simply their eyes. They'll move the wheel chair left or right by simply trying to the specified direction, they'll additionally begin and stop the wheel chair, with alternative eye gestures.

VI. CONCLUSION

This project allows assisting the physically challenged persons to maneuver freely with their own management of the wheel chair which is that the sensing element based mostly machine-driven chair. This project offer self-quality to paralytic patients.

VII. ACKNOWLEDGMENT

Today on completion of this project report, the persons we'd like to impart the foremost United Nations agency have facilitated U.S. throughout the creating of this report and while not whose help it might not have seen the sunshine of the day. Primarily, we have a tendency to submit our feeling and sincere due to our guide and head of department academic. A. A. Ranaware, for his or her constant motivation and support throughout the course of the add the last six month. We have a tendency to actually appreciate and price their prestigious steering and encouragement from the start to the tip of this work. We would wish to impart our principal Dr. M. K. Phadatare United Nation's agency inspired U.S. and created healthy surroundings

International Journal for Research in Applied Science & Engineering Technology (IJRASET)

for all folks to find out in very best means.

REFERENCES

- [1] Rafael Barea, Luciano Boquete, Manuel Mazo and Elena López, System for Assisted Mobility Using Eye Movements based on Electrooculography, IEEE Transactions on Neural Systems and Rehabilitation Engineering, Vol. 10, no. 4, December 2002
- [2] Ding Q, Tong K and Li G, Development of an EOG (ElectroOculography) based human-computer interface, In Proceedings of the 27th Annual International Conference of the Engineering in Medicine and Biology Society, pp 6829–6831, EMBS, 2005.
- [3] 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.
- [4] A. Murarka, M. Sridharan and B. Kuipers. 2008. “Detecting obstacles and drop-offs using stereo and motion cues for safe local motion”.IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS-08).
- [5] Shilpa Gulati, Benjamin Kuipers2008. “High Performance Control for Graceful Motion of an Intelligent Wheelchair”.Proceedings of the IEEE International Conference on Robotics and Automation (ICRA).
- [6] Hansen DW and Ji Q, In the eye of the beholder: a survey of models for eyes and gaze, IEEE Trans Pattern Anal Mach Intell 32(3):478–500, 2009
- [7] Purwanto, D., Mardiyanto, R., and Arai, K.: ‘Electric wheelchair control with gaze direction and eye blinking’, Artif. Life Robot., 2009, (14), pp. 397–400
- [8] Poonam S. Gajwani & Sharda A. Chhabria, Eye Motion Tracking for Wheelchair Control, International Journal of Information Technology And Knowledge Management, Volume 2, No. 2, pp. 185-187, July-December 2010
- [9] Kohei Arai and Ronny Mardiyanto, Eyes Based Electric Wheel Chair Control System, International Journal of Advanced Computer Science and Applications (IJACSA), Vol. 2, No. 12, 2011.
- [10] Q.X. Nguyen and S. Jo.: Electric wheelchair control using head pose free eye-gaze tracker’, ELECTRONICS LETTERS 21st June 2012 Vol. 48 No. 13.
- [11] Anwesha Banerjee, Shounak Datta, Amit Konar, D. N. Tibarewala.: ‘Development strategy of eye movement controlled rehabilitation aid using Electro-oculogram’, International Journal of Scientific & Engineering Research, Volume 3, Issue 6, June-2012
- [12] Jobby K. Chacko, Deepu Oommen, Kevin K. Mathew, Noble Sunny and N. Babu, Microcontroller Based EOG Guided Wheelchair, World Academy of Science, Engineering and Technology (WASET) International Journal of Medical, Health, Biomedical and Pharmaceutical Engineering, Vol. 7, No. 11, 2013.



10.22214/IJRASET



45.98



IMPACT FACTOR:
7.129



IMPACT FACTOR:
7.429



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089  (24*7 Support on Whatsapp)