



## ALERT SYSTEM FOR DISABLED PEOPLE

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**Abstract-**Generally, physically impaired people like paralysis, bone marrow damage and struggling with cope, will suffer so many problems in expressing their needs. We have developed a project to help the people for expressing their needs to the care taker. The needs of the patient like water, food, wash room and emergency instructions are predefined to the x and y axis of the gyroscope respectively. This project is implemented in such a way that by moving any of their flexible part of their body, according to their movement in particular axis the respective need will be intimated through buzzer and LCD display. This will alert the care taker and can respond according to the patients need. One of the main applications of our project is in ICU admitted patients, when the patients use this project the gyroscope sensor is attached to the hand of the patient so that when the patient does not receive oxygen properly or in any other emergency cases if the patient moves his hand away from the bed, then required axis is obtained so that the emergency indication like buzzer will beeps continuously. In this way our project saves many lives even in some cases like heart attacks. We have designed this project using gyroscope sensor, Arduino UNO, LCD display, Buzzer.

**Keywords:** LCD display, Gyroscope.

### 1. INTRODUCTION

According to the recent survey done by WHO it is found that nearly there are 1.3 billion disabled people are present that is approximately 16% of the total

population. Disability is one of the parts of every human's life which is caused due to some health condition of the individual. Disability is defined as the condition of the people which restricts their moment and their sensing ability, simply losing control on their own body parts. This disability has become one of the major problems all over the world. For this reason, every time one person must take care of the patient to fulfill their basic needs. This disability creates a problem for disabled person as well as the care taker of that disabled person. There are different types of disabilities like intellectual disability, physical disability, mental illness etc. From this we are considering the problem of physical disability which are classified as paralysis, bone marrow damage, spinal cord injury, spina bifida.

Physically disabled people will face so many problems in some cases they can't even talk for expressing their basic needs like food, water and wash room. For these basic needs they must depend on another person so they must convey their needs to the caretaker for fulfilling their needs. Now a days we can see so many people died due to heart attacks because of no immediate reaction from the persons who is near to them, there any be a chance of saving their life's by giving immediate CPR to the patient. In this way the death due to heart attack can be avoided for saving the patient life.

## 2. METHODOLOGY:

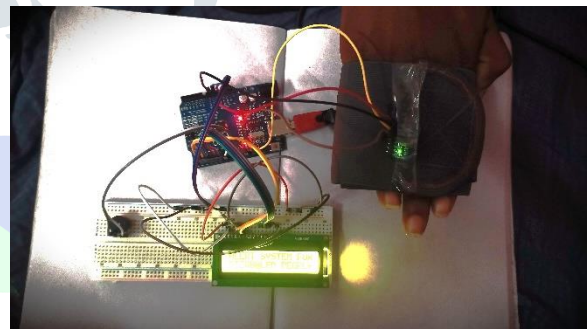
In this methodology after gathering the information about the disabled people mainly considering the physically disabled people like facing paralysis problem. For this reason, we have implemented a system called “alert system for disabled people”. This system is made with the help of gyroscope, lcd display, buzzer which are connected to Arduino uno. The heart of the project is gyroscope which performs the main operation. When the gyroscope is fixed to any one of the flexible body parts of the patient, at present it is fixed to the hand of the patient. The patient can create the required axis with the help of gyroscope sensor. In this case when patient make some angle with their hand then gyroscope transmits the information to the Arduino, based on the predefined code the corresponding message will be displayed in the lcd display and also produces different beeps with the help of buzzer for alerting the caretaker. Another main application is for ICU patients, if there is any inconvenience like breathing problem or some unbearable pain in the body. Then with the help of this project the nurse/compounder will become alert according to the patient need. Our project is very helpful to alerting the caretaker which reduces the problems of the patient. This project another main moto is to reduce the death rate of the disabled people with the help of this device.

## 3. WORKING:

The gyroscope sensor is fixed to the patient’s hand which is connected with Arduino uno. The gyroscope consists of 3 axis (x, y & z) they are elaborated into 6 coordinates we have used only 2 axis that is x & y. when the patient changes the angle of the gyroscope with help of their hand. If the angle of gyroscope is in -x direction based on the predefined code the respective message will be displayed on LCD display and buzzer will produce a particular beep sound. In the same when the gyroscope is in +x, -y & +y directions then the corresponding message mentioned in the code will be displayed on the LCD display and the buzzer will produce different beep patterns as per the code. We have considered -y axis as emergency condition where buzzer will continuously beep until the gyroscope reaches to its original position. The

main use of this axis is when the patient is in emergency condition, they move their hand away from the range of bed then the required axis will be obtained and the emergency condition will be activated, so that the caretaker can help the patient. Based on the patient flexibility we have consider water, food, wash room & emergency conditions to the +x, -x, +y & -y axis respectively, the conditions can be varied according to the patient flexibility. In this way this design has reduced the strain of the caretaker and also saves the time utilized for observing the patient condition continuously. It also makes the patient very comfortable to expressing their needs to the caretaker in a simply manner. So no physical strength is required for the patient.

## 4. RESULTS:



**Fig1: The final kit for displaying the patient need using the gyroscope and the display.**

This equipment is designed for displaying the patient need whenever the patient changes the angle of the gyroscope according to his need then the corresponding message will be displayed on the LCD display. This equipment can be fixed to any fixable body part of the patient.



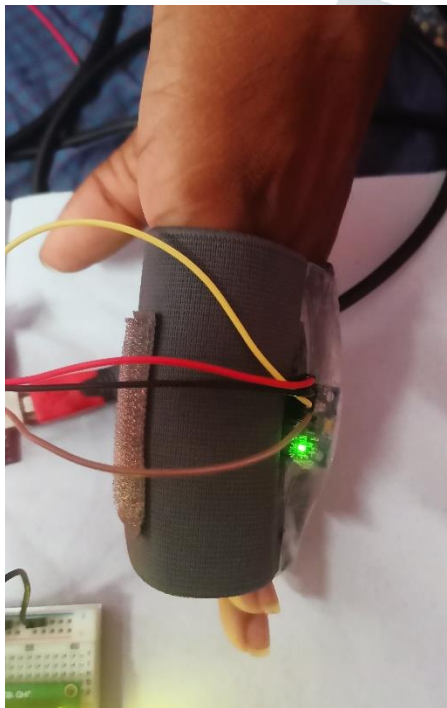
**Fig 2: Indicates the ideal position of the hand**

The fig2 indicates the ideal position of the hand that is in zero axis (neither x nor y axis).



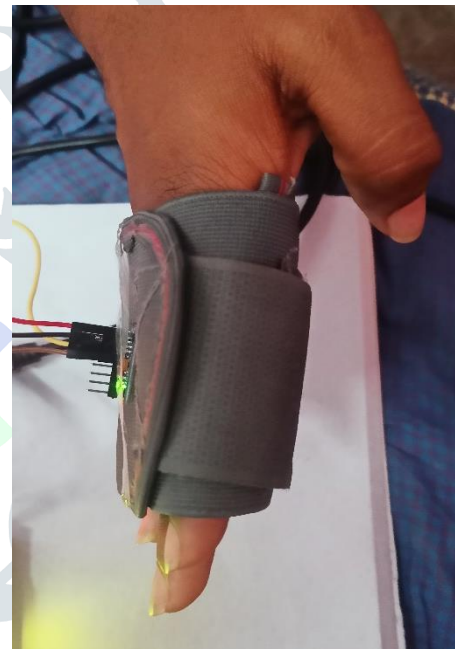
**Fig 4: Displaying the message when the patient hand is in the direction of -x axis.**

The fig4 indicates that the message “I WANT FOOD” is displayed on the LCD display and buzzer will produce the beep sound with some delay when the patient hand is in the direction of -x axis.



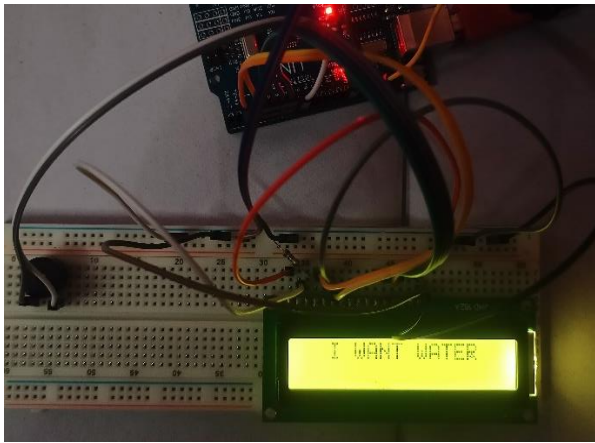
**Fig 3: Hand position of the patient which is in the direction of -x axis.**

The fig3 is the hand position of the patient which is the direction of -x axis for indicating that the patient wants some food to eat.



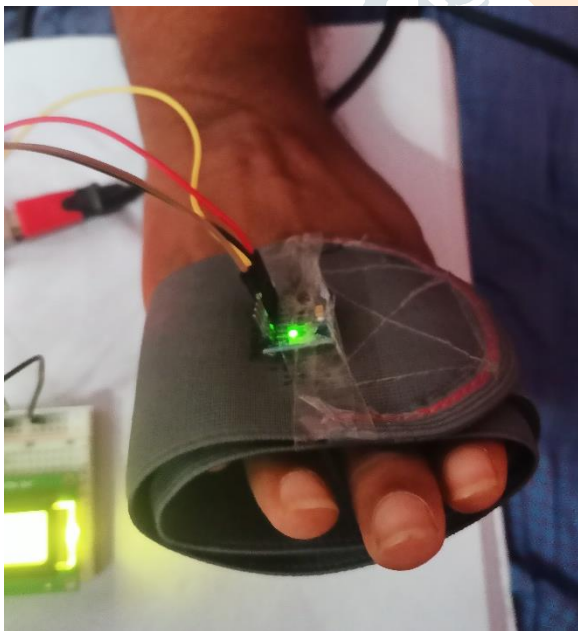
**Fig 5: Hand position of the patient which is in the direction of +x axis.**

The fig5 is the hand position of the patient which is the direction of +x axis for indicating that the patient needs some water to drink.



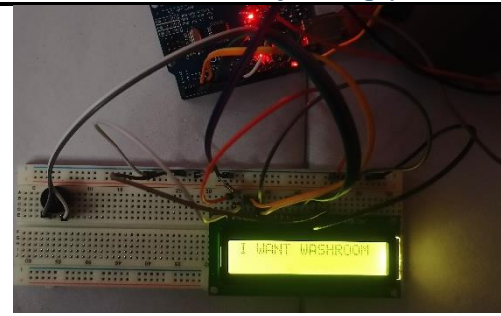
**Fig 6: Displaying the message when the patient hand is in the direction of +x axis.**

The fig6 indicates that the message “I WANT WATER” is displayed on the LCD display and buzzer will produce the beep sound with some delay when the patient hand is in the direction of +x axis.



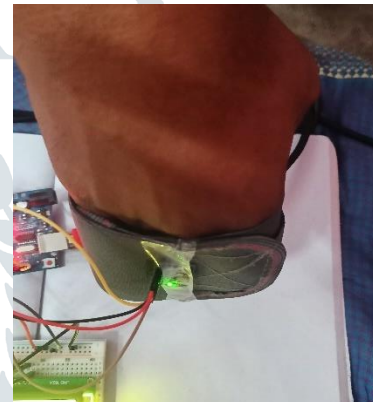
**Fig 7: Hand position of the patient which is in the direction of -y axis.**

The fig7 is the hand position of the patient which is the direction of -y axis for indicating that the patient wants to go to the washroom.



**Fig 8: Displaying the message when the patient hand is in the direction of -y axis.**

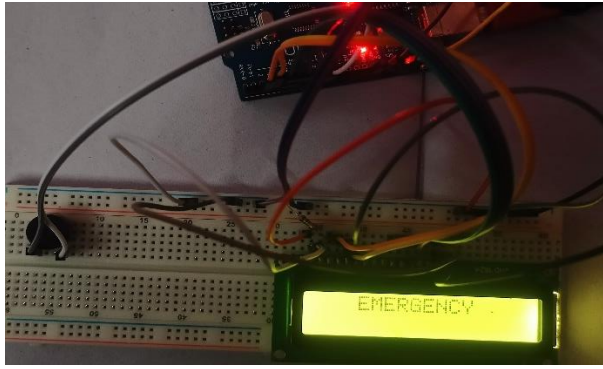
The fig8 indicates that the message “I WANT WASHROOM” is displayed on the LCD display and buzzer will produce the beep sound with some delay when the patient hand is in the direction of -y axis.



**Fig 9: Hand position of the patient which is in the direction of +y axis.**

The fig9 is the hand position of the patient which is the direction of +y axis for indicating that the patient is in some emergency condition.

## REFERENCES:



**Fig 10: Displaying the message when the patient hand is in the direction of +y axis.**

The fig10 indicates that the message “EMERGENCY” is displayed on the LCD display and buzzer will produces the beep sound continuously when the patient hand is in the direction of +y axis.

## 5. CONCLUSION:

According to the study of the result we can conclude that the “alert system” is a good device for helping the patients to convey their basic needs to the caretaker by using lcd display, buzzer and also helps in many emergency situations. By using this device, we can help the bed rest patients and ICU patients even in saving their life’s. This may play a key role in reduction of the death rate.

## FUTURE SCOPE:

The future scope of our project is to replace the buzzer with speaker module. The buzzer can differentiate the need but can’t define what the exact need is, if we replace the buzzer with speaker module the speaker can give the voice message according to the exact need of the patient. With the help of this speaker module the uneducated people can understand the need simply by listening. In addition to that we have utilized only two axes of the gyroscope at present but future scope is to utilize all the three axes of the gyroscope efficiently.

- [1] World Health Organization [Internet]. Cardiovascular diseases (CVDs), 2017. [cited 2018 October 28]. Available from: [http://www.who.int/newsroom/factsheets/detail/cardiovascular-diseases\(cvds\)](http://www.who.int/newsroom/factsheets/detail/cardiovascular-diseases(cvds)).
- [2] John Hopkins Medicine [Internet]. Vital Signs (Temperature of the body, Heart Rate, Blood Pressure of the patient). [cited 2018 October 28]. Available from: [https://www.hopkinsmedicine.org/healthlibrary/conditions/cardiovascular\\_diseases/vital\\_signs\\_body\\_temperature\\_pulse\\_rate\\_respiration\\_rate\\_blood\\_pressure\\_85,p00866](https://www.hopkinsmedicine.org/healthlibrary/conditions/cardiovascular_diseases/vital_signs_body_temperature_pulse_rate_respiration_rate_blood_pressure_85,p00866)
- [3] Simmers, L. Diversified Health Occupations. 1988. 2nd ed. Canada: Delmar. Pp. 150-151
- [4] Healthline [Internet]. To know the Normal Body Temperature Range, 2018. [cited 2018 October 28]. Available from: <https://www.healthline.com/health/whatis-normal-body-temperature>.
- [5] Harvard Medical School [Internet]. Your health will be depended on the present and future heart rate, 2016. Available from: <https://www.health.harvard.edu/blog/resting-heart-rate-can-reflect-current-future-health-201606179806>.
- [6] Mukherjee, D., Gupta, K., Pandey, M., Agrawal, A. Microcontroller Based Cardiac Counter System. 2013. Vol. 02, Issue 1, April 2013.
- [7] Heart.Org [Internet]. Tachycardia: Fast Heart Rate. [cited 2018 October 28]. Available from: <http://www.heart.org/en/health-topics/arrhythmia/aboutarrhythmia/tachycardia--fast-heart-rate>
- [8] Mayo Clinic. Bradycardia. [cited 2018 October 28]. Available from: <https://www.mayoclinic.org/diseasesconditions/bradycardia/symptoms-causes/syc-20355474>
- [9] Ufoaroh, S. U., Oranugo, C. O., Uchechukwu, M. E. alert system for heartbeat monitoring using GSM. 2015. In International Journal of

Engineering Research and General Science  
Volume3, Issue 4, JulyAugust, 2015. Pp. 26-34

- [10] Abdullah, A., Ismael, B., Rashid, C., Abou-ElNour, D., Tarique, M. Real time wireless health monitoring application using mobile devices. 2015. In International Journal of Computer Networks & Communications (IJCNC) Vol.8, No.3, May 2015. DOI: 10.5121/ijcnc.2015.7302. pp. 13-30.
- [11] Subhani, S. M., Sateesh G. N. V., Chaitanya, C., Prakash, B. G. Temperature Monitoring and heartrate System using GSM. 2013. In Research Journal of Engineering Sciences Vol. 2(4), 43-45, April (2013). Pp. 43-45.
- [12] H. Luo, X. Zhu, H. Lakdawala, L. Carley, G. K. Fedder. A copper CMOS- MEMS z-axis gyroscope, 14th IEEE Int. Conf. Microelectromechanical Systems, Las Vegas, pp. 631-634, 2001.
- [13] B. Zhang. Overview and Improving Fiber Optic Gyroscope Based on MEMS/NEMS Fabrication, 2006,[http://www.iop.org/EJ/article/1742-6596/34/1/025/jpconf6\\_34\\_025.pdf?request-id=d829c17a-1bd2-49f3-9f20-50246763842a](http://www.iop.org/EJ/article/1742-6596/34/1/025/jpconf6_34_025.pdf?request-id=d829c17a-1bd2-49f3-9f20-50246763842a)
- [14] X. Li, R. Lin, K. Leow. Performance-Enhanced MicroMachined Resonant Systems with Two-Degrees-of-Freedom Resonators, Journal of Micromech, Microengineering, vol. 10, 2000, pp. 534-539.
- [15] F. Ayazi, K. Najafi. Design and fabrication of a high performance polysilicon vibrating ring gyroscope, IEEE Micro Electromechanical Systems Workshop, Heidelberg, Germany, pp. 621-626, 1998.