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Wheelchair Safety Device for Children and Handicapped

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Abstract: ***Falling down from a wheelchair is among the significant reasons for clinical issues that are faced by older individuals, small babies, and handicapped individuals. These individuals will more often harm themselves from tumbling down when they are alone. When a falling occasion happens, clinical consideration needs to give promptly to diminish the gamble of the faller from getting serious wounds that might prompt demise. A few advances have been created and a few used webcams to screen their exercises. Nevertheless, the cost of movement and foundation is exorbitant and only relevant for the indoor environment. Some clients additionally stressed over their security issues. The current marketed gadget is by wearing a wearable remote crisis transmitter which confines the development of the client and produces a high Phoney problem. This examination proposed a wheelchair-individual fall identification framework using Arduino and gyroscopic sensor which is financially savvy and dependable to identify falls and alarm encompassing to call for help. For fall discovery, the mpu6050 sensor GSM module and Arduino are carried out into the framework. At the point when fall occasions happen, the information incorporating the area of the wheelchair will be sent to the caretakers of that person and the alarm fixed to the device will be turned on automatically. Also, this framework requires less execution cost and gives a speedy reaction. It can introduce in the current business wheelchair. For the future proposal, a superior GUI configuration can be executed into the framework other than that, more discovery frameworks can be added to build the precision of the framework.***
Keywords: Sensor-Arduino, Wheelchair Fall detection, GSM module, mpu6050

I. INTRODUCTION

The quantity of increasing population lead expanding number of more independent individuals and medical problem individuals. With expanding the number of these individuals, the interest in medical care administration increments quickly. These individuals who have a medical problem or older individuals normally need more solidarity to walk accordingly, a wheelchair will be utilized. The individuals who utilised wheelchairs however live freely are presented with higher chances of falls. Other than that, tumbling down regularly may make mental and physiological harm that leads to extreme injury and even passing on the off chance that clinical consideration isn't given right away. To diminish the gamble of these individuals getting hurt from falls, clinical consideration should be given right away. Hence, a dependable fall location framework can assist with distinguishing falls in old individuals and quest for help and backing. These days, there are two kinds of wheelchairs which are business and brilliant or controlled wheelchairs. A business wheelchair is an ordinary wheelchair that doesn't have any innovation on it, and it is for the most part overall utilized. A brilliant or fueled wheelchair comprises of regulator unit which permits the client to give input data through a joystick, voice order, etc., with the goal that the wheelchair can consequently move to the objective. A generally brilliant or controlled wheelchair is less utilized in typical family or clinical offices because of its excessive cost. In this way, a new framework that can distinguish fall occasions should be intended to be carried out in the overall utilized business wheelchair with cost-productive. Older individuals and the inability individuals are the people who for the most part use a wheelchair in their day-to-day routine. These individuals have a high gamble of falling and harming themselves. Tumbling down and becoming oblivious can be deadly on the grounds that no one knows about this happening occasion themselves. On the off chance that these individuals are living alone or their family is not around, it might lead the faller to have more extreme wounds. It is vital to have a fast reaction and salvage time assuming a falling occasion happens. Each human has the right to free development. It is a basic assertion, yet has an extraordinary sway on the certainty and confidence of a diversely abled individual. However, manual wheelchairs give freedom sometimes incapacity, not all the crippled can have development physically driving the wheels. Subsequently, there is a solid necessity of electric wheelchairs. Savvy Wheelchair with SMS Caution and Safety Features is an electronic wheelchair.

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II. HARDWARE SPECIFICATIONS

1) Arduino uno
2) MPU 6050
3) Buzzer
4) Gsm module
5) Jumper wires
6) Breadboard
7) Arduino power cable
8) Sim card
9) Arduino IDE software

III. COMPONENT DESCRIPTION

A. *Arduino UNO*

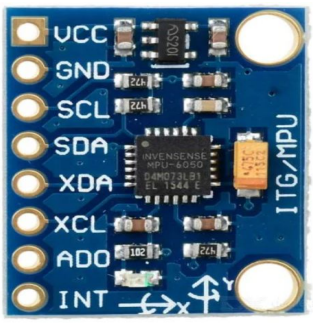
A microcontroller is a little PC on a singular facilitated circuit containing a processor community, memory, and programmable information/yield peripherals. The one we used is the Arduino Uno considering ATmega328P Arduino is a single-board microcontroller planned to make the way toward using devices in a multidisciplinary setup that can be more open. The hardware contains a single open-source hardware board arranged around an 8-digit Atmel AVR(Automatic Voltage Regulator) microcontroller. An Arduino board contains an Atmel 8-bit AVR microcontroller with vital parts to energize programming and union into various circuits. A fundamental piece of the Arduino is the standard way that connectors are uncovered, allowing the CPU board to be related with a grouping of viable additional modules known as safeguards. The item involves a norm.



B. *MPU 6050*

The InvenSense MPU-6050 sensor contains a 3 Axis MEMS accelerometer and a 3 Axis MEMS gyro in a solitary chip. It is extremely exact, This assists us with estimating speed increase, speed, direction, removal, and numerous other movement-related boundary of a framework or article. also, numerous other movement-related boundaries of a framework or item.

This module additionally has a (DMP) Digital Motion Processor inside performing complex estimation and along these lines let loose the work for Microcontroller which is sufficiently strong. The module additionally has two helper pins that can be utilized to connect outside IIC modules like a magnetometer, but it is discretionary. So assuming you are searching for a sensor to control movement for your RC Car, Drone, Self-adjusting Robot, Humanoid, Biped, or something to that effect then this sensor may be the ideal decision for you.



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C. GSM Module

GSM stands for global system for mobile communication, A GSM modem or GSM module is a gadget that utilizes GSM cell phone innovation to give remote information connect to an organization. GSM modems are utilized in cell phones and other hardware that speaks with cell phone organizations. They use SIMs to distinguish their gadget from the organization.

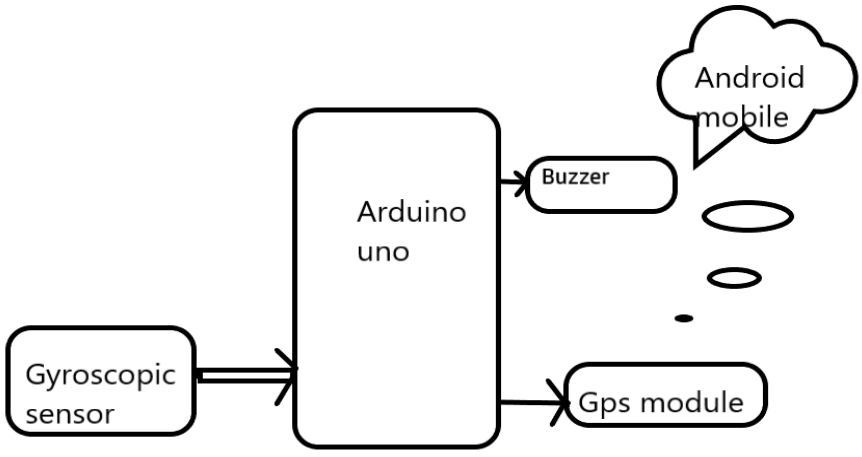
A GSM module or a GPRS module is a chip or circuit that will be used to layout the correspondence between a cell phone or a figuring machine and a GSM or GPRS framework. The modem is an important aspect that contains a modulator and demodulator, A GSM modem can be a given modem contraption with a sequential, USB, or Bluetooth affiliation, or it can be a PDA that gives GSM modem capacities. There are different cell sizes in a GSM system, for instance, full scale, limited scope, Pico, and umbrella cells. Each cell shifts as per the execution space. There are five particular cell sizes in a GSM orchestrate full scale, scaled down the scale, Pico



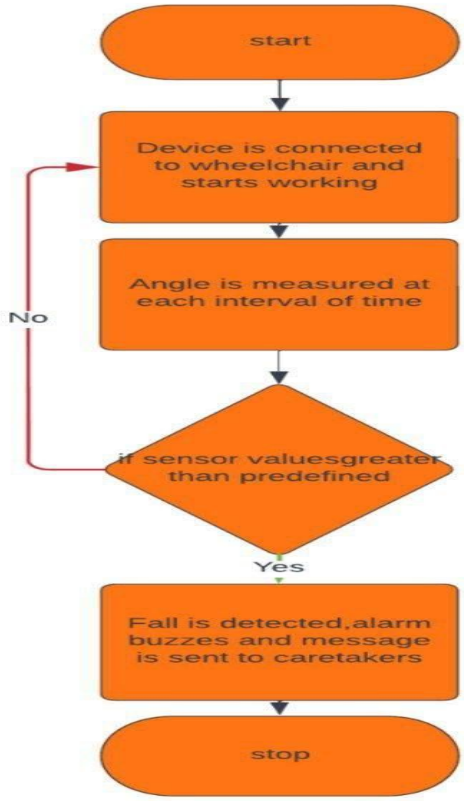
IV. PROPOSED METHODOLOGY

Every one of the sensors from the wheelchair will begin its own program. All of the sensors had set edge regard. The sensor that will be utilized in the framework is an accelerometer with a gyroscope sensor MPU6050 is a Micro Electro-mechanical framework (MEMS), which comprises of three-pivot accelerometer and a three-hub whirligig. It assists us with estimating speed, direction, orientation, dislodging, and other movements like highlights.

At the point when the sensor distinguished a specific value and the value surpasses the limit esteem, the fall recognition framework will be a trigger. Whenever the distinguished value surpasses limit esteem, the client can decide the situation of fall through the flowchart of the accelerometer with a gyroscopic sensor. Accelerometer with whirligig sensor use to distinguish the speed and afterward the place of the wheelchair. Assuming the speed of the wheelchair surpasses the edge esteem that had been set or the place of the wheelchair isn't steady, it will recognize as fall. The buzzer will get turned on and will alert the surroundings of the person.

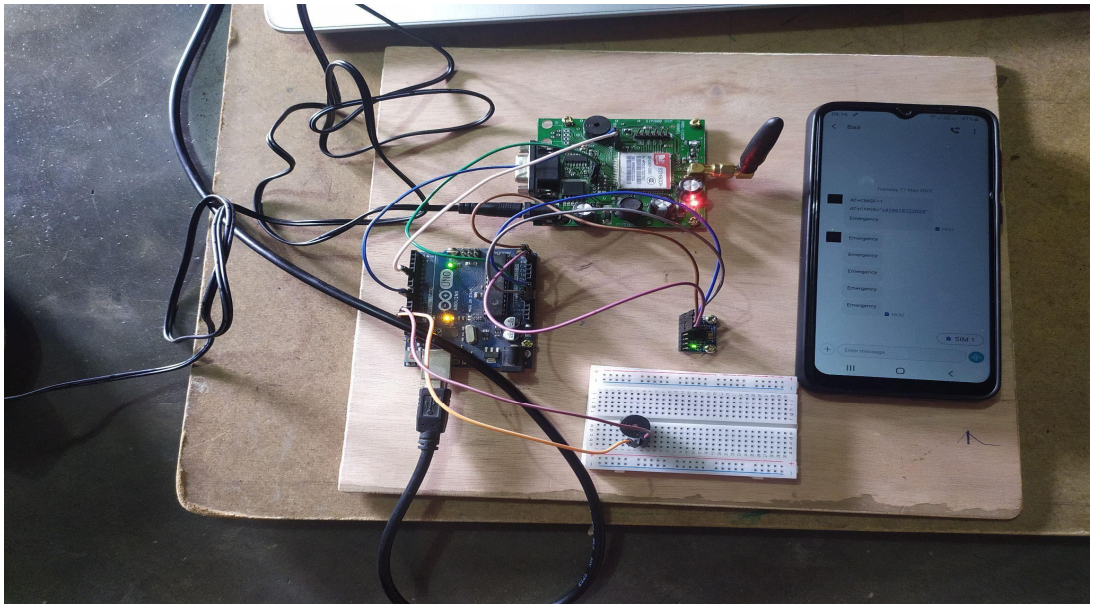


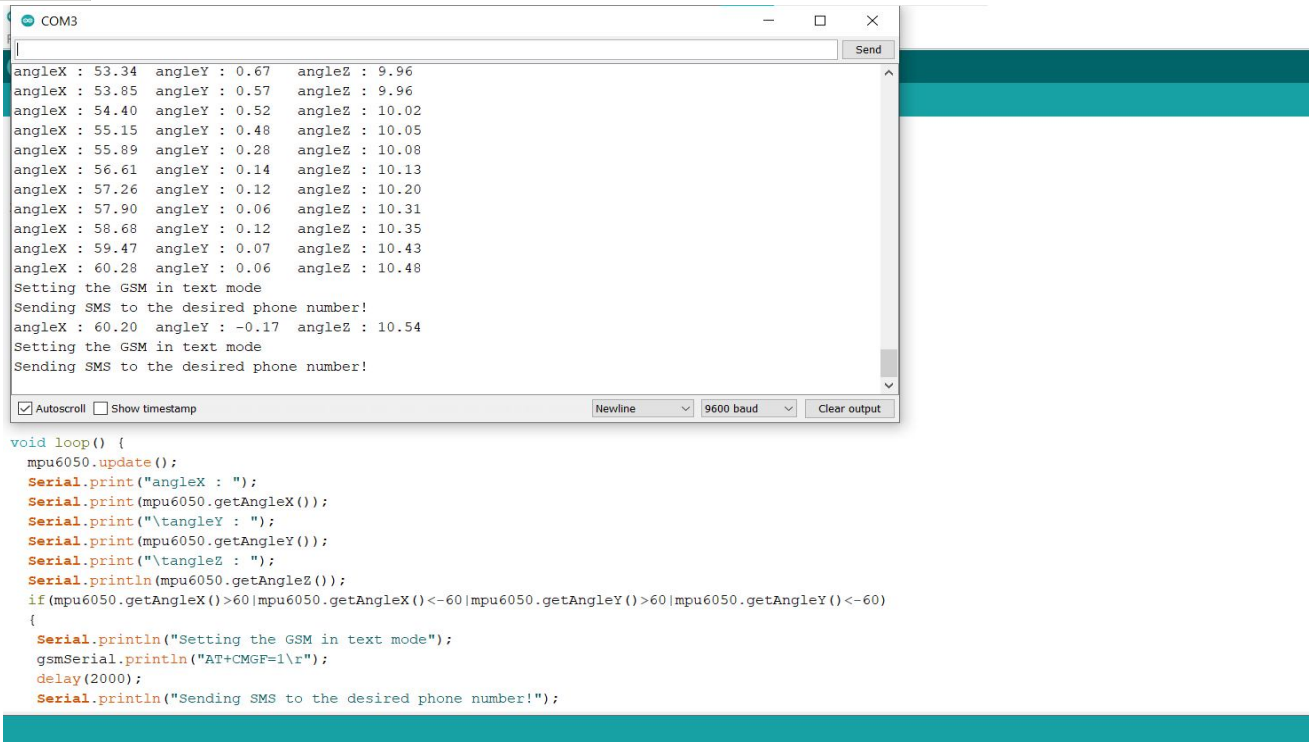
The given below flowchart shows the working of the project initially the gyroscope sensor measures the orientation of the wheelchair in front of the ground every time at regular intervals of time if the values of the sensor exceed the predefined values then the device considers that the event of fall if the value to not exceed the predefined then it will scan continuously after the fall event is recognized then the device starts the alarm and alerts the caretakers of the person.



V. HARDWARE RESULTS

The below diagram shows the outputs of the project.



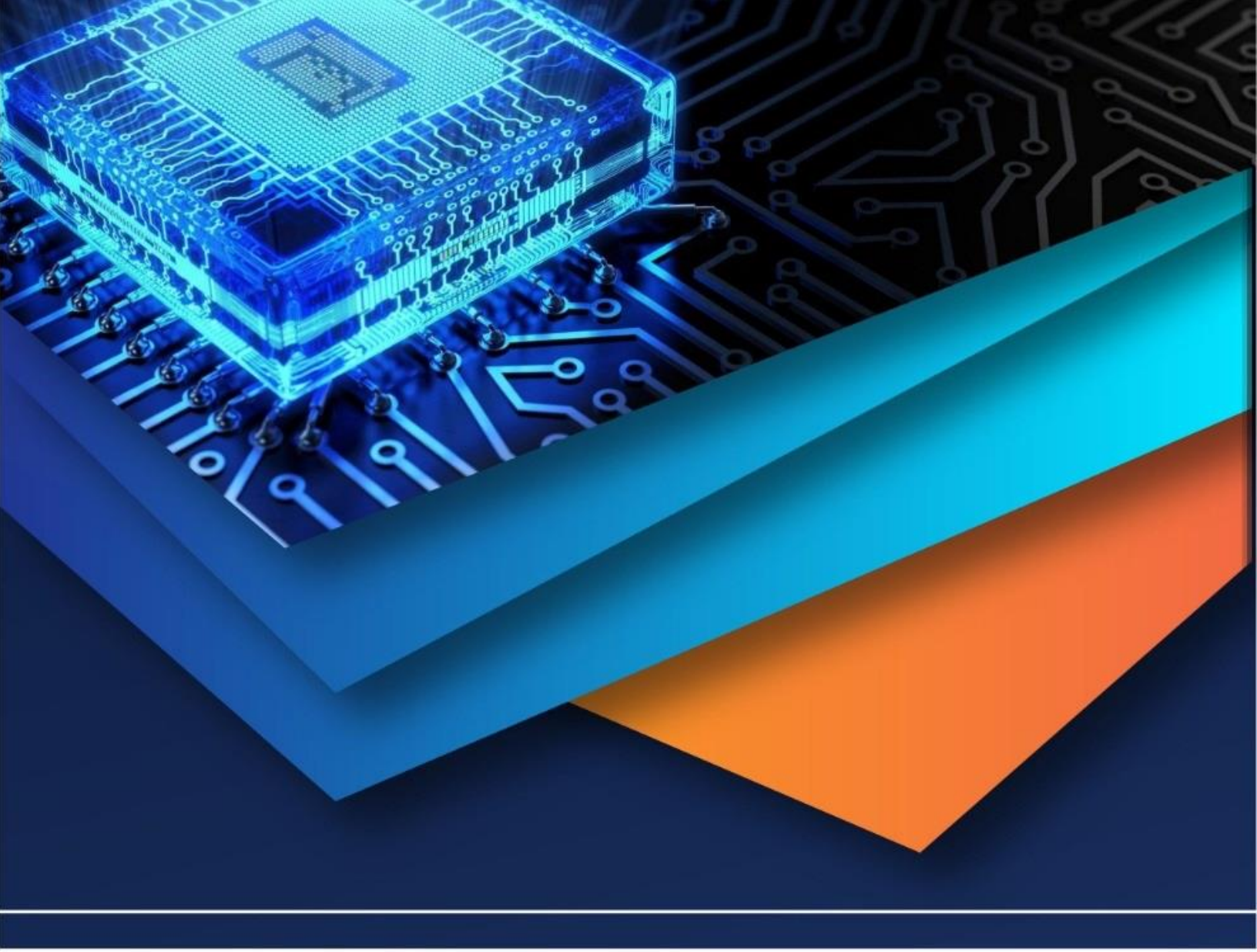


VI. CONCLUSIONS

The above proposed methodology is a simple device that can fit for any kind of wheelchairs effectively and easily,Because of its low cost it can be easily available to everyone and can be afforded by anyone one, because of its small size it can be easily portable from one place to another ,It uses gsm and alarm system to alert the nearby person and to those caretakers who are away from home,by timely alerting the care tackers one can save the disabled person from injuries and threat to life, Hence it is very useful device and The proposed methodology has been designed and verified successfully.

REFERENCES

[1] Vishwakarma, S. K., 2017. Development of smart wheelchair, Dehradun: Dit University,.
[2] Israel, A., 2014. Framework and Method for fall counteraction and recognition. Joined State, Patent No. US 8866620 B2.
[3] S J Badashah and P Subbaiah, “Surface Roughness Prediction With Denoising Using Wavelet Filter” International Journal of Advances in Engineering & Technology, (IJAET) ISSN: 2231-1963, www.ijaet.org, May 2012, Volume-3,issue-2,pp-168-177.
[4] El-Bendary, N., Tan, Q., Pivot, F. C. and Lam, A., 2013. Fall location and avoidance for the old.Global Journal on Smart Sensing and Intelligent System, 6(3), pp. 1230-1266.
[5] Yoosuf Nizam, M. N. H. M. M. A. J., 2016. A Study on Human Fall Detection Systems: Daily Activity Classification and Sensing Techniques. International Journal of Integrated [6] Leaman, J. and M.La, H., 2017. A Comprehensive Review of Smart Wheelchairs. New York, s.n.
[6] T M Prasad and S J Badashah, “Hardware/Software co-simulation of BPSK Modulator using Xilinx system Generator”, IOSR Journal of Engineering (IOSRJEN),e-ISSN:2250-3021,p-ISSN:2278-8719,www.iosren.org,Volume - 2, issue-10, pp-54-58, Oct 2012
[7] Posugade, V. G., Shedge, K. K. and Tikhe, C. S., 2012. Contact Screen-Based Wheelchair System. Worldwide Journal of Engineering Research and Application (IJERA), 2(2), pp. 1245-1248.
[8] Gulve, A., Batale, S., Shinde, S. and Sabnis, 4., 2017. Brilliant Assistance for Wheelchair Users. Worldwide Engineering Research Journal, 2(9), pp. 3578-3581.
[9] Nsengumuremyi, L., Karki, A. J. & CR, M., 2018. Smart Wheelchair Using Medical Iot. International Journal for Research in Applied Science & Engineering Technology, 6(5), pp. 387-393.
[10] Ms.S.D.Suryawanshi, Mr.J.S.Chitode & Ms.S.S.Pethakar, 2013. Voice Operated Intelligent Wheelchair. International Journal of Advanced Researcher in Computer Science and Software Engineering, 3(5), pp. 487-490.
[11] Shaheen, D., E.Himabindu, Sreenivasulu, D. T. & Rangasamy, D. R., 2018. An OoT Based System to Detect a Person/Wheelchair Fall. International Journal of Engineering & Technology, 7(6), pp. 735-739.
[12] M Haritha and S J Badashah,“A Novel VLSI Architecture for SPHIT Encoder.” International Journal Of Computers & Technology, (IJCT) volume 10 issue 4, 15 Aug 2013, pp 1522-1530.ISSN:2277-3061.



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