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INTELLIGENT COMPANION WALKER USING EXPLOITATION SENSOR

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ABSTRACT

The main aim of this work is to help the recent persons while not the human would like. It's acknowledged that the senior citizens carry a hand walker with them whenever they have a support. Typically even after they use this walker, there's no guarantee that the senior voters area unit safe and secured in reaching their destinations. There is also Associate in Nursing obstacle in their path however isnot encountered by the person with the assistance of the walker. Thus, the folks is also battle-scarred if the obstacle is sufficiently big or dangerous. Thus, a style has been developed to help the senior voters and supply them a transparent path.The system consists of ultrasonic sensing element mounted to the user's walker. Whereas the user moves the walker within the forward direction, the un-hearable sensing element mounted to the walker tries to notice the obstacle if any present within the path. If the sensing element detects the obstacle, the output of the receiver triggers and this transformation are going to be detected by the microcontroller since the output of the receivers is given as inputs to the microcontroller. Thus, the microcontroller in real time alerts the buzzer as presently it receives the triggered output from any of the sensors.It additionally has Associate in arduino ide software system that is employed for uploading a program in arduino board. The forced sensing element is employed inorder to urge the vibration as this helps to flow into blood in our body.The GSM module is employed to send the message once the fall is detected and accelerometer is used for angle detection. Therefore the LDR is employed for sense day and night. LCD display is use to display the force value and message delivery report.So that the whole dominant unit are going to be mounted to the good walker.

KEYWORDS:Forced sensor, Ultrasonic sensor, LDR, Arduino IDE,GSM Module, Accelerometer, Buzzer, Toggle key.

2.INTRODUCTION:





Fig.1. Person with normal walkerFig.2.Pain

From the fig.1 falls are thought of the most explanation for concern and loss of independence among the aged population and also are a significant explanation for morbidity, incapacity and health care utilization. within the majority of fall events external support is imperative so as to avoid major consequences. Therefore, the flexibility to mechanically observe these fall events may facilitate reducing the interval and considerably improve the prognosis of fall victims.From the above fig.2 while the user walking with the stand,the user got to bent down whereas holding the walker this causes severe back pain of the user.Locomotion, quality Dysfunctions and helpful Devices:Mobility is one in all the foremost necessary human schools and might be outlined because the ability of a private to maneuver freely through multiple environments and perform daily personal tasks with ease. Differing types of pathologies, like infantile paralysis, neural structure injuries, sclerosis or trauma, have an effect on human quality at totally different levels inflicting partial or total loss of such school. Recent evidences conjointly show that quality restrictions are associated to psychological feature and psychosocial disturbances, that additional impair the standard of lifetime of the individual additionally, it's far-famed that quality decreases bit by bit with age as a consequence of neurologic, muscular and/or osteo-articulardeterioration.Although most gait/mobility disturbances are well recognized, solely alittle variety of such conditions may be absolutely reversed by surgical procedures or rehabilitation approaches. Therapeutic alternatives in such cases embrace the choice and prescription of helpful devices to supply adequate useful compensation and to prevent the progression of the incapacity and improve the general quality of lifetime of the affected subjects.The choice of the foremost applicable model of helpful device needs careful analysis and interpretation of the clinical options.Associated with the subject's residual motor capability, together with psychological feature perform, vision, proprioception perform , muscle force (trunk and limbs), chronic standing of lower and higher limb joints, overall physical learning of the patient and conjointly further characteristics of the surroundings within which the patient lives and interacts. Severe dysfunctions in one or additional of such options will compromise the safe use of the device and increase the danger of falls or energy expenditure[8,9,10] .

Based on the degree of quality restriction, the patients may be classified into 2 broad useful groups:

1.Individuals with total loss of the quality capability

2.Individuals with partial loss of quality, presenting totally different levels of residual motor capability.

Individuals happiness to the primary cluster have fully lost the flexibility of move by themselves and are at high risk of confinement in bed and, consequently to suffer the results of prolonged immobility. samples of subjects during this useful cluster embrace patients with complete neural structure injury, advanced neurodegenerative pathologies, severe lower limb degenerative joint disease and fractures of the spine/lower limb bones. In such cases, however, the motion may be performed by helpful technology called various devices. while not the employment of such instrumentation, the locomotion might become AN not possible task for these patients, even through tiny areas . Some samples of various devices are robotic wheelchairs and special vehicles, together with tailored

scooters..thoughmost gait/mobility disturbances are well recognized, solely alittle variety of such conditions may be absolutely reversed by surgical procedures or rehabilitation approaches. Therapeutic alternatives in such cases embrace the choice and prescription of helpful devices to supply adequate useful compensation and to prevent the progression of the incapacity and improve the general quality of lifetime of the affected subjects.The quality provided by the choice devices will facilitate patients to realize a particular quantity of independence throughout daily tasks and will have positive impact on vanity and social interaction. However, the prolonged use of such devices do not stop immobility-related diversifications in spine and lower limbs, characterized by loss of bones,lower limbs, characterized mass, circulatory disorders, pressure ulcers and different physiological impairments .The second useful cluster consists by people that gift some level of residual motor capability, which may be sceptered by a helpful device. In different words, the employment of such augmentative devices aims to empower the user's natural suggests that of locomotion, taking advantage of the remaining motor capabilities. This second cluster of rehabilitation devices may be classified into wearable orthoses and prostheses or external devices, like canes, crutches and walkers. Within the last decade, researches within the field of intelligent augmentative devices have enlarged, with specialize in the implementation of advanced robotic solutions for individuals withincapacity. This work hasundertaken a difficult agenda aimed toward extending the individuals autonomous life on the far side the house. The surroundings wherever the system operates is partly far-famed (due to its giant variability) and dynamic. Our assisted living device system should thus acquire dynamic data concerning the user's immediate surroundings so as to guide its decision-making. The development of a system of such quality represents significant scientific and technological effort transportation along experience across totally different disciplines. The secret's to merge varied technological branches and advancements so as to get a good system to assist aged individuals.It is to form a system which will facilitate the aged move around and be supervised at constant time. This provides a good and safe means for the user to be ready to foretold the risks before going down. The system is integrated on a Walker, so turning into the good Walker.

3.EXISTING SYSTEM:



Fig.3.User solely walking with stick

From the above fig 3 as in earlier days,there was solely walking stand with none sensors hooked up to that.In next stage walker was enforced by victimization unhearable device to discover the obstacle.But solely few were willing to switch their walkers by a robotic walker and that they square measure unfamiliar the technology used.



Fig .4.Aged people walking with human support

From the above fig 4, thefalls square measure thought of the most reason behind concern and loss of independence among the senior population and also are a serious reason behind morbidity, incapacity and health care utilization. within the majority of fall events external support is imperative so as to avoid major consequences. Therefore, the power to mechanically discover these fall events might facilitate reducing the time interval and considerably improve the prognosis of fall victims .



Fig. 5.User fallen in the ground by use of previous module

From the above fig 5 it has proven that even in a simple floor or in a ground via user of walker can be fallen so there's no safety by means of the use of regular module in the beyond days.

4.PROPOSED SYSTEM:

The planned system consists of an Arduino IDE package that is employed for uploading a program in arduino board. The forced sensing element is employed inorder to induce the vibration as this helps to flow into blood in our body and also the force price and also the prospective message are displayed within the digital display.The un-hearable sensing element is employed to sight the obstacle.The output of the receiver triggers and this variation is detected by the microcontrollerand in real time alerts the buzzer.The GSM module is employed to send the message once the autumn is detected,the number is directly inserted into the package rather than exploitation keyboard.LCD display is use to display the force value and message delivery report.The LDR is employed for sense day and nightand the measuring instrument is employed for fall detection i.e.., it detects the angle.In general the autumn detection algorithms await a response of the user once a attainable fall so as to create a call if matters is vital or not. However this can be not invariably applicable and convenient for the tip user, particularly for senior those who square

measure the target cluster of our analysis. An accelerometer-based rule considering the residual movement once the autumn.

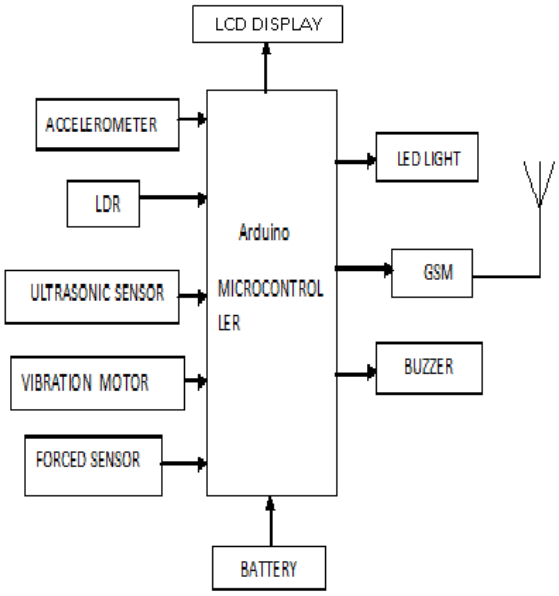


Fig.6.Block Diagram

The ultrasonic sensing element detects the obstacle. The microcontroller in real time alerts the buzzer as presently it receives the triggered output from any of the sensors.It additionally has Associate in Nursingarduino ide software system that is employed for uploading a program in arduino board. The forced sensing element is employed inorder to urge the vibration as this helps to flow into blood in our body.The GSM module is employed to send the message once the autumn is detected and therefore the LDR is employed for sense day and night. LCD display is use to display the force value and message delivery report.

6.DESCRIPTION OF TOOLS:

6.1.Forced sensor:



Fig.7.Forced sensor

A **force-sensing resistor** is a material whose resistance changes when a force, pressure or mechanical stress is applied. They are also known as "force-sensitive resistor" and are sometimes referred to by the initialism.The forced sensor is used inorder to get the vibration as this helps to circulate blood in our body and the force value and the prospective message will be displayed in the LCD.

6.2.Ultrasonic sensor:





Fig.8.Ultrasonic sensor Fig.9.Buzzer

As the name indicates, ultrasonic sensors measure distance by using ultrasonic waves. The sensor head emits an ultrasonic wave and receives the wave reflected back from the target. Ultrasonic Sensors measure the distance to the target by measuring the time between the emission and reception.The ultrasonic sensor is used to detect the obstacle. The output of the receiver triggers and this change is detected by the microcontrollerand immediately alerts the buzzer.

6.3.LED Light:





Fig.10.Led light ***Fig.11.LDR***

It is a component that has a variable resistance that changes with the light intensity that falls upon it. daylight=5000ohms,20000000ohms. Therefore the LDR is employed for sense day and night. LCD display is use to display the force value and message delivery report.

6.4.Accelerometer:

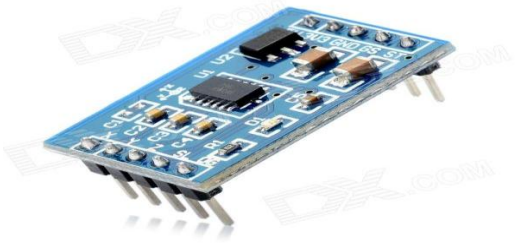


Fig.12.Accelerometer

The **accelerometer** measures the projection of the gravity vector on the sensing axis.

The amplitude of the sensed acceleration changes according to the sine of the **angle** α between the sensing axis and the horizontal plane.Accelerometer sense either static r dynamic forces or it is usedfor angle detection.

6.5.GSM Module:



Fig.13.GSM Module

Global System for Mobile Communication is most widely used in Europe and other countries.It uses a variation of time division multiple access(TDMA)and used for digital wireless telephony technologies. It is used for transmitting mobile,voice&data services. The GSM module is employed to send the message once the autumn is detected

6.6.LCD Display:

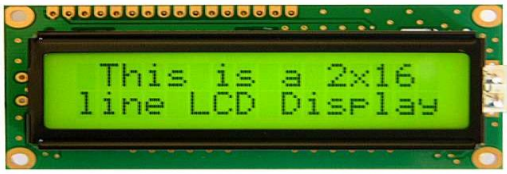


Fig.14.LCD Display

Liquid crystal display is a flat panel display that uses the light modulating properties of liquid crystals. LCD display is use to display the force value and message delivery report.

6.7.Arduino IDE Microcontroller:



Fig.15.Arduino IDE Microcontroller

The abbreviated form of ide is integrated development and environment which means it facilitates application development .since the development are faster ,all tools are in a single box.ARDUINO ide is a open source technology software which is used for uploading a program by arduino software in arduinoboard.It is an open source computer hardware abdsoftwarecompany,project and user community that design and manufactures single board microcontrollers and microcontroller kits for building digital devices and interactive objects that can sense and control objects in the physical world .

7.EXPERIMENTALRESULTS:



FIG.16. COMPANION WALKER

The above fig.16 describes about the planned work consists associate Arduino IDE package that's utilized for uploading a program in arduino board. The forced sensor is used so as to induce the vibration as this helps to flow into blood in our body.The force value and the possible message are displayed among the LCD display.The un-hearable sensor is used to sight the obstacle, the output of the receiver triggers and this variation is detected by the microcontroller and in real time alerts the buzzer.The GSM module is used to send the message once the season is detected,the number is directly inserted into the package instead of exploitation keyboard. LCD display is used to display the force price and message delivery report and the LDR is used for sense day and night. In general the season detection algorithms look a response of the user once a possible fall thus on produce a decision if matters is significant or not. but this may be not invariably applicable and convenient for the tip user, significantly for senior people who unit the target cluster of our analysis. associate accelerometer-based rule considering the residual movement once the season.



FIG.17. FALL DETECTION

The above fig 17 is theanticipated output of the fall detection ,when the walker is fallen then the message might be send to the concern individual approximately the fall is detected ,as the range may be directly uploaded in the arduino software without the usage of the keypad.

CONCLUSION:

As a final approach, the Smart Walker is of great importance. During testing and implementation, there were a lot of difficulties concerning the various interfaces and wiring challenges in such a small area to implement such number of parts. The objectives were fulfilled and especially the learning process of this work. Literally speaking, a blind person can use the Smart Walker and move around in a controlled environment such as a house;the elderly is also capable of being monitored remotely and can feel safe since someone is constantly there to answer to his/her need.The smart walker uses motion and speed sensors to monitor the user's gait, and sends the data directly to medical caregivers or the user via a mobile app. The insight helps the user improve their gait. Smart Walker users get updates whenever a fellow user is in their area, creating a social network that also encourages medical recovery through group support.By increasing the convenience and safety of employing a walker, the sensible Walker conjointly has the potential to encourage a additional active mode in aged adults with restricted quality Physical activity has been shown to decrease the amount of injuries in aged adults by serving to them maintain a better overall fitness level, reducing the chance for chronic health condition. The increased quality offered by the sensible Walker will have a preventative medicine benefit; increased quality for aged adults may result during a attenuated rate of depression and anxiety. It's imperative that we have a tendency to still realize ways that to stay aged adults active whereas still keeping them safe from falls. We have a tendency to believe that the sensible Walker can facilitate accomplish this goal by providing a secure.

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