

# GERIATRIC CARE-FALL DETECTION SYSTEM USING AIR JACKET

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**Abstract**—An event of fall is one of the common problems faced by older adults that can cause injuries and lead to hospitalization. The event of a fall in the case of an elderly person is more likely to result in hospitalization when compare to children. This fear hinders the independence of older people preventing them from leading a normal life like other individuals. A dread of fall event also has dramatic psychological consequences in the older adult since it drastically reduces the self-confidence of the individual. This distress may also contribute to future falls with more severe impact and the mental and physical health of the individual. The consequences of a fall event also depend on the time delay in providing appropriate medical assistance.

**Keywords**—voltage regulator, Rectifier, Transformer, GSM modem

## 1. INTRODUCTION

Childhood, youth, adulthood and old age are different stages of life. With increasing age, we become old. Birth, development, decline and death are the laws of life. Whether we want it or not, we have to pass through these stages. Old age is also one part of this cycle. According to WHO, most developed countries have accepted the chronological age of 65 years and above as a definition of 'elderly' or older persons

Young old - up to 75 years.  
Old-old - up to 85 year  
Very old - over 85 years

. Geriatric Care: It is a specialty that is based on improving health care for elderly people. It is the process of planning and coordinating care of elderly people to meet their long-term care needs and improve their quality of life. Geriatric comes from Greek word where 'gurus' refers to old age and 'iatrea' refers to treatment.

Gerontology: Comprehensive study of aging and the problems of the aged.

ensure timely medical assistants by sending the information of the fall event to the caregivers. This project is designed as compressed air and solenoidal valve which helps in mitigating the impact of fall.

The system consists of GPS module that provide the accurate location of the user. The system also measures the body parameters such as temperature, pressure. In the previous years, different technologies have been implemented in identifying an event of fall which was based on pressure, orientation or tilt and vibration of the object as indicators of a fall event. Some fall detectors also make use of video monitoring and vibration analysis. These monitoring devices are subjected to various design limitations and flaws related to low light, field of view, dependency on location and high cost. The major limitation

Age: Period of life when impairment of physical and mental functions becomes increasingly manifested in comparison to the previous years of life



An event of fall is one of the common problems faced by the older adults that can cause injuries and lead to hospitalization. WHO indicates that 30% of the older person fall atleast once every year. Fall and fall-related injuries are responsible for 70% of accidental death in persons who are aged 75 years and above. This project aims at developing a fall detection system capable of accurately detecting a fall event and minimize the impact of fall. The primary aim of this project is to detect and minimize the impact of fall when an old person falls and wearable jacket which consist of pressurized plastic air bag storing restriction on the user with a need to press the button after a fall event which is very unlikely after a fall event. Furthermore, these wearable devices may also be subject to many false alarms caused by fall like activities in daily routines, such as sitting on a sofa or lying on a bed

### Objective

- Maintenance of health function.
- Prevention of deterioration of any existing problem.
- To give immediate treatment and avoids fall-related injuries.

### Scope

- The main outcomes that may be considered for geriatric care,
- Maintain body alignment and posture.

- Protect from injuries, Falls and Accidents etc.
- Make elderly stay in home interesting and lively.
- Observe body parameters such as temperature, pressure

The 220V alternating current is converted into 12V direct current by using the step-down transformer and Full-wave Bridge rectifier

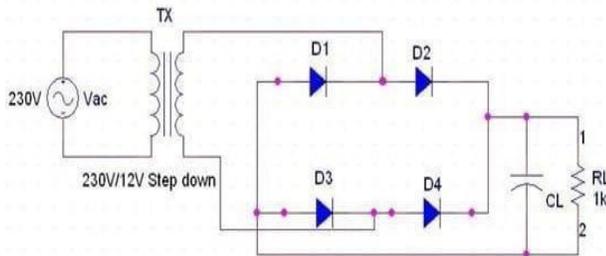


Fig.3.PowerSupply

## Arduino Uno

Arduino Uno is a microcontroller board based on the ATmega328P. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, 16MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter. Arduino Uno has a number of facilities for communicating with a computer, another Arduino board, or other microcontrollers.

## Voltage Regulator

connector. This allows the device to be connected to most E-Block I/O ports. The LCD display requires data in a serial format, which is detailed in the user guide below. The display also requires a 5V power supply. Alphanumeric displays are used in a wider range of applications, including palmtop computers, word processors.



Fig.4.potentionmeter

GSM Modem

A regulated power supply is very much essential for several electronic devices due to the semiconductor material employed in them have a fixed rate of current as well as voltage. The device may get damaged if there is any deviation from the fixed rate. The AC power supply gets converted into constant DC by this circuit. By the help of a voltage regulator DC, unregulated output will be fixed to a constant voltage. The circuit is made up of linear voltage regulator 7805 along with capacitors and resistors with bridge rectifier made up from diodes. From giving an unchanging voltage supply to building confident that output reaches uninterrupted to the appliance, the diodes along with capacitors handle elevated efficient signal conveyed.

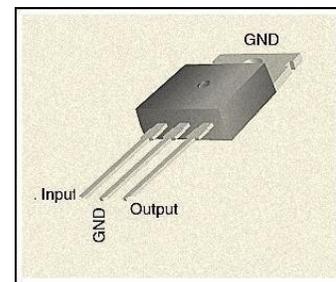


Fig.4.7805IC

## LCD Display

This is an LCD Display designed for E-blocks. It is a 16 character, 2-line alphanumeric LCD display connected to a single 9-pin D-type

## Potentiometers

Potentiometers are commonly used to control electrical devices such as volume controls on audio equipment. Potentiometers operated by a mechanism can be used as position transducers, for example, in a joystick. Potentiometers are rarely used to directly control significant power (more than a watt), since the power dissipated in the potentiometer would be comparable to the power in the controlled load.

This GSM Modem can work with any GSM network operator SIM card just like a mobile phone with its own unique phone number. Advantage of using this modem will be that its RS232 port can be used to communicate and develop embedded applications. The SIM800C is a complete Dual-band GSM/GPRS solution in a SMT module featuring an industry-standard interface, the SIM800CS is a quad-band GSM/GPRS module that works on frequencies GSM 850MHz, delivers performance for voice, SMS, Data, and Fax in a small form factor and with low power consumption

## [1] RESULTS

In our proposed system, we designed a method to detect snoring event by sound sensor. When snoring started the diaphragm inside the sound sensor vibrates and it generates electric signal and it given to the MicrocontrollerUnit. When a snoring event is detected the electrical stimulator delivers a small amount of electric current to the pharyngeal muscle of the throat.

The system records the snoring events continuously. If the snoring doesn't stop, a text message



Fig.6. Proposed System

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In our proposed system, we designed a method to detect fall detection for elderly people by using accelerometer sensor. It helps in detecting the posture of the user by 3 axes (X, Y, Z). The accelerator sensor is fixed with a pre-defined value to recognize the posture of the person. If the pre-defined value decreases an alert is placed and the air blower pump activates the air bag. A text message with location, body parameters (temperature, pressure) and call alert will be sent to the caretaker and hospital through GSM modem

## CONCLUSION

The development of a fall detection system requires a non-negligible warmup time to understand the problem of falls fully. In this project, the basics of the fall-problem together with the most relevant approaches have been described. The aim is to provide guidelines to speed up the design process of a new fall detection system by compiling the merits of efforts taken during the past 30 years in developing a fall detection system.

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