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Intelligent Human Body Safety System

P. V. Balwan[1], Kamble Vaishanavi[2], Kamble Aarya[3], Kudache Shreya[4]
[1]*Lecturer, Dept. of Electrical Engineering, Sharad Institute of Technology Polytechnic, Ichalkaranji, India*
[2,3,4]*Student, Dept. of Electrical Engineering, Sharad Institute of Technology Polytechnic, Ichalkaranji, India*

***Abstract*: Falls are the second leading cause of accidental injury deaths worldwide, and annually an estimates 424,000 individuals die of fail globally, of which over 80% occur in low-and middle-income countries. According to statistics 90% of hip fractures were resulted from the consequence of fail. For a fail result in a hip fracture, the force applied to the proximal femur must exceeds its strength. Three conditions influencing this outcome were: the falling people must land on or near the hip; protective responses must fail; and local soft tissues can't absorb enough energy to prevent fracture. Because galt speed decreases with the increasing age, frail elderly people are more likely to land on the hip. Furthermore, reaction time becomes long on account of the age. Therefore, protective responses may be delayed. In addition, done strength decreases that is connected with the age. Hip fractures are associated with serious mortality and disability; about 20% of patients would die within 1 year and 40% of the surviving patients can't regain their re-fracture functional condition and suffer psychological and social disabilities. The cost of hip fractures worldwide has been estimates to be about 34,800 million.**

***Keywords*: Human body safety system.**

1. Introduction

Falls are the second leading cause of accidental injury deaths worldwide, and annually an estimates 424,000 individuals die of fail globally, of which over 80% occur in low-and middle-income countries. According to statistics 90% of hip fractures were resulted from the consequence of fail. For a fail result in a hip fracture, the force applied to the proximal femur must exceeds its strength. Three conditions influencing this outcome were: the falling people must land on or near the hip; protective responses must fail; and local soft tissues can't absorb enough energy to prevent fracture. Because galt speed decreases with the increasing age, frail elderly people are more likely to land on the hip. Furthermore, reaction time becomes long on account of the age. Therefore, protective responses may be delayed. In addition, done strength decreases that is connected with the age. Hip fractures are associated with serious mortality and disability; about 20% of patients would die within 1 year and 40% of the surviving patients can't regain their re-fracture functional condition and suffer psychological and social disabilities. The cost of hip fractures worldwide has been estimates to be about 34,800 million.

According to the David Hynd, Matthew Muriehead, Jolyon Carroll, Alistair Barr and Jonathan Clissold (2016). By David Hynd, Matthew Murruwhead, Jolyon Carroll, Alistair barr and Johnathan Clissold describe the paper "Evaluation of the Effectiveness of an Exemplar Equestrian Air against Crush Injuries."

Horse rider fatalities have occurred during the cross-country phase of three-day evening when horses have fallen and landed on their riders. There are Intelligent Human Body Safety System available for horse riders, which are designed to inflate and offer protection when the rider falls from a horse, but the effectiveness of these "Human body system" against crush injury form a falling horse is not well understood.

2. Proposed methodology and operating principle

A. *Working*

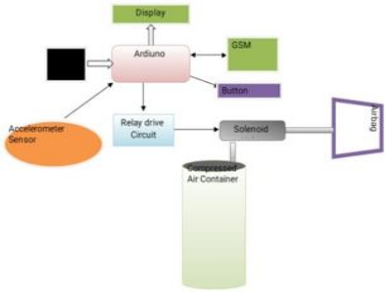

Fig. 1. Block diagram

In this system central part is Arduino uno. We interface the accelerometer sensor for sensing direction or angle, we use the A0, A1 channel for sensor have 3 axis X,Y,Z we used the axis of sensor. They sense two directions. We give the set point to the sensor when sensor cross the set point our gives that single to the Arduino on the relay that connected solenoid valve through the compressed air tank. When valve on started air filling in jacket. We also use the GSM for send the msg on our mobile. Role of the GSM is whilst person no well and they press the button the message will send to the that person relative.

B. *Circuit diagram*

Circuit diagram description

1. Arduino UNO R3 Board.
2. Accelerometer sensor.
3. Power supply.
4. LCD Display.
5. Solenoid valve.
6. Relay.
7. GSM.
8. Relay driver.

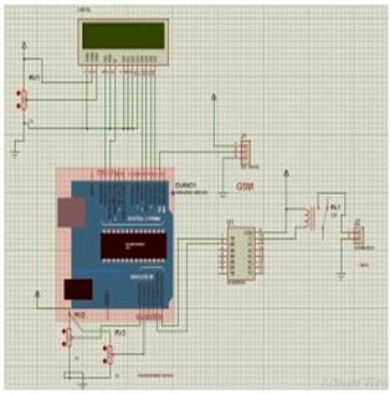

Fig. 2. Circuit diagram

1) Arduino UNO R3 Board

Fig. 3. Arduino Uno

The Arduino Uno R3 is an open source microcontroller board based on the ATmega328 chip. This Board has 14 digital input/output pins,6 analog input pins, onboard 16 MHz ceramic resonator, Port for USB connection, Onboard DC power jack, An ICSP header and a microcontroller reset button. It contains everything needed to support the microcontroller. Using the board is also very easy, simply connect it to a computer with a USB cable or power it with DC adapter of battery to get started. The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the at mega 168U2 Atmega8U2 up to version R2) programmed as a USB-to-serial converter. While the Arduino UNO can be powered via the USB connection or with an external power supply, the power source is selected automatically.

2) Accelerometer

Accelerometer sensor can measure static (earth gravity) or dynamic acceleration in all three axis. Application of the sensors in in various fields and many applications can be developed using the sensor. Accelerometer sensor measures level of acceleration where it is mounted this enable us to measure acceleration/deceleration of object like car or robot, or tilt of a platform with respected to earth axis, or vibration produced by machines. Sensor provides 0G output which detect linear free fall. Sensitivity can be adjusted in two ranges.

Features:

1. Simple to use.
2. Analog output for each axis.
3. +5V operation @1ma current.
4. Robust design, high shock survivability.

3) Power Supply

Power supply should supply at least this voltage under worst-case current consumption, assumed to be about 200mA. Because a full wave rectifier will be used for efficiency (diodes, D1-D2) we can assume that about 1.4volt will be loss across the bridge (0.7volt per conducting diode). We therefore need a transformer was selected as T1, which is of rating 9-0-9 secondary at 500mA.

4) LCD Display

Fig. 3. LCD display

LCD indicate different mode setting and set point adjustment. Also 16 characteristics are divided.

5) Solenoid Valve

A solenoid valve is an electro-mechanically operated valve. The valve is controlled by an electric current through a solenoid; in the case of a toe-port valve the flow is switched on or off; in the case of a three-port valve, the outflow is switched between the two outlet ports. Multiple solenoid valves can be placed together on a manifold. Solenoid valves are the most frequently used control element in fluidics. Their tasks are to shut off, release, dose, distribute or mix fluids. They are found in many application areas. Solenoids offer fast and safe switching, high reliability, long service life, good medium compatibility of the materials used, low control power and compact design.

Fig. 4. Solenoid valve

6) Relay

When power flows through the first circuit, it activates the

electromagnet(brown), generating a magnetic field (blue) that attracts a contact(red) and activates the second circuit. When the power is switched off, a spring pulls the contact back up to its original position, switching the second circuit off again.

Fig. 5. Relay

7) GSM

Fig. 6. GSM

This GSM Modern can accept any GSM network operator SIM card and act just like a mobile phone with its own unique phone number. Advantage of using this modern will be that we can use its RS232 Port to communicate and develop embedded applications. Applications like SMS control, data transfer, remote control and lagging can be developed easily. It requires SIM a card just like mobile phones to active communication with the network complete also they have IMEI (International Mobile Equipment Identified) number similar to mobile phone for their identification. A GSM can perform the following operations:

1. Receive, send and delete SMS messages in a SIM.
2. Read, add, search phonebook entries of the SIM.
3. Make, Receive, or reject a voice call.

Specification:

Design for industrial application:

1. High-powered industrial cellular module.
2. Housing; iron, providing IP30 protection.
3. Power range: DC 5~35 v.

3. Result and Discussion

This project is mainly applicable for industry purpose and tower working purpose. when person will be doing work at a place, after many reasons then this will be not in well condition then that time alarm will be on and at that time message will be send and person will be safe.

4. Conclusion

To find out individual functions of the human body system and then learned how the system all work together. All of the human body system have their own special function and are all important to the day to day operation of the human body.

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