Fall Detection

High level description

A system that simulates a person falling on the ground and calling the police for help. It consists of 3 blocks. The Fall Detector Block, The Fall Duration Block and the SOS Block. The Fall detector block samples the position of the person and sends acknowledgment of a fall to the fall duration block which activates the SOS block after a long fall.

User Guide

1) Accelerometer starts on the ground level.
2) Move accelerometer up to simulate standing up to start sampling
3) Sampling rate of accelerometer is 15 values per 7.5 seconds for demonstration purposes.
4) +ve accelerometer values on serial monitor indicate person is moving higher
5) –ve accelerometer values on the serial monitor indicate person is moving lower
6) A Fall = at least 10 –ve values in the last 15 samples.

Technology Used

Hardware:

Teensy3.0 Microcontroller
Atmega1284 Microcontroller
MM7455 Accelerometer
LCD Display
Speaker
Led

Software:

Atmel Studio 6.1
Arduino 1.0.5

Link to Demo Video

http://youtu.be/FGXksP3k-F4

Source files links

Aelga001_Project_Accelerometer_teensy3.ino

https://drive.google.com/file/d/0B0vTA0w0Ijs_eFdLRHBoUXhmX3M/edit?usp=sharing : uses the Arduino Wire library to read accelerometer values using I2C and detects analyses the values to detect a fall.

Wire Library

https://drive.google.com/folderview?id=0B0vTA0w0Ijs_bnVMSXJDczcxNWM&usp=sharing : Arduino I2C library

aelga001_Project_ATMEGA1284.c

https://drive.google.com/file/d/0B0vTA0w0Ijs_N2xJUmVaNkdwajA/edit?usp=sharing : controls the LCD display, the speaker and receives the fall acknowledgment from the fall detector block

aelga001_bit.h

https://drive.google.com/file/d/0B0vTA0w0Ijs_R1B0Z2JiWG5IQmc/edit?usp=sharing : includes GetBit and SetBit functions that are used for bit manipulation

aelga001_Lcd.h

https://drive.google.com/file/d/0B0vTA0w0Ijs_NTJKQlZ5UkZ5WE0/edit?usp=sharing : contains functions to initialize the LCD and display output on the screen.