SOFE-3450 Lab 2 - Fall Monitor

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Project Introduction

The government is currently looking for fall monitor system that will look to reduce the number of deaths by falls for seniors (aged 65+). The fall monitor system includes a device to be worn and a website to register users. The worn device has to be able to detect when its user has fallen as well as communicate to the company agents so that help can be notified. It also has to differentiate when a user is in an emergency situation or not.

The team was awarded the government contract for this project because of our genuine interest in the topic. Each team member not only has family that will, or eventually will, benefit from this device, they also see themselves benefiting from the future avenues of technology this project will lead to. As software engineering students this project was a perfect fit to start our portfolios as it is simple, yet will have a large impact on Canadians.

The end goals for this project is to implement a device into the real world that will save lives, and also increase our economy by providing jobs to Canadians. We also hope that this project will also lay out the infrastructure for future life saving devices that the team can be apart of.

Project Objectives

- Develop a sensor that can detect if a fall occurs, as well as monitors heart rate
- Sensor itself will have a gps device that will record the location of user, information will be private until a fall occurs.
- The sensor will preferably have a battery life that can last at least a day
- The sensors communication module will be reliable, in a number of situations the distress signal will be received properly
- If there is no movement after the fall a agent will be called, sending gps coordinates and allowing the client to contact the agent
- Development of a website where a user can send in their information to verify their eligibility for a free device.
- The website will be secure insuring that the personal information sent through the website will be protected
- Will verify the users eligibility based on address, age, health care number, and government aid information

Project measures of success

Overview

- Project completes on time
- Project completes on budget
- A low cost per device which is reliable is designed
- A functional website and database are created
- The database/website should have equal security to similar government websites

To ensure requirements are being met, the device, website, and project objectives are tested. The device will be considered functional if is is responsive to a fall, can place a call to a agent, and provide an accurate gps location. Furthermore, the cost of production should be evaluated. The website must accept and store valid information into a database. The website must be able to validate health card numbers, from the user, using the government's data. Security on the database/website is a high priority as it contains sensitive information about it's users. The accompanying website must safe from modern attacks and alert if it has been successfully attacked; should have the same security as the government's website. The project is successful if it completes on time, on budget, and meets the requirements stated above. The completed device must be highly reliable and durable, within a low manufacturing budget.

Project Infrastructure

- Device that User will be wearing
- GPS to locate user
- Sensor to measure heart rate
- Information transfer mechanism to deliver user info (gps, status, time of fall) to agent
- Speaker/microphone to allow agent to communicate with user
- Online website that is elderly friendly to handle user data input / registration, device information, purchasing devices/parts as well as handling customer concerns.
- Cloud server to store user information
- Agent application - where agents who receive a call from the device can pull up the customer information and call the appropriate authorities
- Device will use ZigBee protocol to establish connection to the network. This is because of the low power to save battery life and this technology is being used for smart home devices and will be able to join that suite of technology as well as

ZigBee will be a great base infrastructure for the future technology in life preservation.