Overview:
The use of wearable sensing technology in vital signs monitoring and fitness tracking is ubiquitous. However, wearable devices on the market may not be suitable for chronic patients and the elderly because those devices rarely have emergency-notification system. Therefore, there is a need for a wearable device and a system that can continuously monitor health data and notify situations such as unconsciousness or faint to others. This system could safeguard patients and the elderly from unattended accidents or death.

Objectives:
Develop a new wearable sensors system monitoring vital signs and transmitting health data to smartphone using Bluetooth
  • Sensation Smart Watch: collects, display and transmit vital signs data including step counts, heart rate and fall event.
  • Smartphone Application for both iOS and Android: allows users synchronize time of the smartwatch, visualize health data and report fall location to a central server immediately when the watch detects that the user has fallen.
  • Central Server Program: collects and displays all fall records in a webpage which only be accessible with a specific username and password.

Design:
System Block Diagram of Sensation Smart Watch Circuit

System Block Diagram of Sensation Server Program

Functions of Smartphone Application
- Discover and connect with the watch
- Send and receive all health information, synchronize watch time, and send fall event to the central server when it receives fall alerts from the watch

Results:

Sensation Smart Watch

Complete Circuit of Sensation Smart Watch