

Mobile Medical Devices and Apps  
Spring 2016

**Project #1 – Public Safety App – assigned 1-21-16; due 2-16-16**

Each year, the number of pedestrians road traffic fatalities exceed 270,000 ([http://apps.who.int/iris/bitstream/10665/79753/1/9789241505352\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/79753/1/9789241505352_eng.pdf)). Some of these deaths are children on their way to or coming from school. Additionally, pedestrian-based robberies and other attacks impact public health. ([http://www.popcenter.org/problems/street\\_robbery/](http://www.popcenter.org/problems/street_robbery/)).

The objective is to design an app to improve public health in pedestrian safety using GPS, accelerometer, and gyroscopic data on the iPhone and with the sensors and Arduino microprocessor supplied to you by the instructors.

**Third Party Libraries**

Your team shall not use any third-party library for software or hardware development other than the following libraries:

6 degrees of freedom – 6dof(Arduino)[V7]  
<http://bildr.org/2012/03/stable-orientation-digital-imu-6dof-arduino/>

FreeIMU-20121122\_1126  
<http://www.varesano.net/projects/hardware/FreeIMU>

The zip files of the two libraries for mac os x is on the class Box web site. The links list the original web sites. These may be used to interconnect the accelerometer and gyroscope sensors to the Arduino Yun.

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## **Project #2 – Occupational Therapy App – assigned 2-16-16; due 5-2-16**

Hemiplegia is a condition that affects one side of the body. The condition may be further refined as right or left hemiplegia, based upon the affected side of the human body. The cause is due to an injury to the region of the brain, which controls movement of the head, face, trunk, or limbs.

Occupational therapists and patients, especially pediatric patients, would benefit from an app that meets their specific needs to facilitate the improvement in the condition.

The objective is to design an app to meet the needs of pediatric hemiplegia patients and occupational therapists to improve treatment using GPS, accelerometer, and gyroscopic data on the iPhone and with the sensors and Arduino microprocessor supplied to you by the instructors.

### **Third Party Libraries**

Your team shall not use any third-party library for software or hardware development other than the following libraries:

6 degrees of freedom – 6dof(Arduino)[V7]

<http://bildr.org/2012/03/stable-orientation-digital-imu-6dof-arduino/>

FreeIMU-20121122\_1126

<http://www.varesano.net/projects/hardware/FreeIMU>

The zip files of the two libraries for mac os x is on the class Box web site. The links list the original web sites. These may be used to interconnect the accelerometer and gyroscope sensors to the Arduino Yun.

### **Supplied Resources**

The class Box site has several authoritative sources and other materials that discuss a variety of topics that may or may not be useful for this project.