ECE 1778 – Creative Applications for Mobile Devices
February 2013
Assignment #A4, for Appers

Creativity, Sensors and You

A key outcome of this course, for Appers, is that you become comfortable with brainstorming ideas, in your field or wherever you go to work, on using mobile devices as solutions to problems, as an artistic medium or an avenue to augment the human condition.

In this assignment, I'd like you to come up with a series of ideas within or near to your discipline that make use of current and future sensors that are in (or may be present in the future) mobile devices.

Before doing that, I'd like to remind you that the basic capability of a mobile device is that it is a powerful computer, capable of deep optimization, signal processing, database storage, and connected to the Internet such as discussed at least briefly in assignment A3. Now that you've listened to the various proposals and some plans from all the projects in the course, I hope that you're getting a sense of different capabilities of mobile devices. The devices' input and output methods are described in detail in Lecture #2.

The main outcome of this assignment is that you will spend time coming up with ideas for interesting apps using the current and future sensors on mobile devices, *in your field*. My expectation is that you will continue to do this well after the course is over!

For most of you, I believe your field is broad enough to allow the generation of many ideas – those of you in the iSchool, Drama, Industrial Engineering, Aerospace, Rehabilitation, Anthropology, Education and Medical Studies have plenty of places to go with this assignment. If you feel you need to broaden your field to work in this assignment, please talk to me.

1 Reprise Your Field Description

In Assignment A1, you gave a short description of your field for the lay-person to understand. Create a newer version of this description, again 250 words, that includes some reflection of what you've learned so far in this course.

2 Ideas for Mobile Devices as they are Now

Give 3 ideas for complete, novel apps in your field that *make use of the following sensors, either in combination or separately*:

1. Accelerometer
2. Gyroscope
3. Barometer
4. Camera

5. Light Sensor
6. Proximity Detector

What does Novel mean? A simple Google search on the basic idea doesn't yield a bang-on hit as a mobile device app. How do you come up with novelty? Kick ideas around with people in your field.

Important: In your description, include some sense of the difficulty of the processing required of the input data. For example, at this point you should have some sense, from the discussion, that computer vision – recognizing objects or people – is considered to be quite difficult. One way you can think about the processing difficulty is to count the number of data samples that must be looked at by the computer. In computer vision, there are many pixels, and they have to be looked at in concert. In speech recognition, there is less; however understanding speech is also difficult, but state-of-the-art speech recognition systems have improved rapidly over the last few years.

Each of the three apps should be described in one paragraph of 50-100 words each (*Maximum: 3 x 100 = 300 words*).

Please review Lecture #2 to see some description of these sensors:
http://www.eecg.utoronto.ca/~jayar/ece1778/ece1778_lecture2.pdf

3 Ideas for Mobile Devices in the Future

Now let's consider the sensors that may come in the future, and to do the same thing – suggest three novel apps that make use of these sensors. Describe the function of these app ideas in one paragraph of 50-100 words each (*Maximum: 3 x 100 = 300 words*).

1. A three-dimensional gesture sensor that works in front of the phone, in a similar manner to Microsoft's Kinect, if you are familiar with that. If not, this video: http://www.youtube.com/watch?v=MWlLFEFj7J4 shows you a version of it work. (Full disclosure: I am an investor in XYZ Interactive).
2. An ultrasound sensor that can look inside a human body.
3. An Emotion Sensor – which says which emotion is being felt by the holder of the phone, and gives the intensity on a scale from 1 to 10.
4. A Blood Pressure Sensor
5. Brain electrical activity measurement sensor – which provides the voltage across the user's brain, in 3 dimensions, at a granularity of 1mm.

Due: Tuesday February 26th, at 6pm, 0.5 marks off every hour late.

Submit your PDF document on the Blackboard Course Portal. Be sure to submit it to the 'A4' Assignment.