First Progress Report

Our project is structured to enable three work streams to proceed in parallel –hardware build, grip recognition modelling, and user interaction schemes.

## Hardware Build

<**Varun**, please fill out this section>

## Grip Recognition Modelling

<**Zahid**, please fill out this section>

* ***Achieved***: We are interested to find out if there exists any patterns of the hand-grip pressure when user does different activities on the phone. We are targeting several machine learning mechanisms to classify these patterns given the pressure measurement data on the phone. Mainly, we are interested to apply Naïve Bayes and Support Vector Machine (SVM) to classify this pressure data. Towards this and as an initial test, we used the data collected from the testbed application that measures accelerometer data and applied both NB and SVM to identify simple activity patterns on phone (tap/ no tap). The two models correctly identified the patterns with the accuracy of 85% (SVM) and 92% (NB).
* ***Upcoming***: We will apply SVM and NB on the pressure data which will be collected from testing subjects while they do different activities on the phone. We will then use these models to execute different user interaction scheme when the pressure sensor signals match the modeled patterns.

## User Interaction Schemes

* ***Achieved***: Created Android application that mimics Apple’s solution to problem of using a large screen device. Developed secondary user interaction scheme that shrinks the touchable area, while maintaining aspect ratio. In progress of creating a sequence of user interactions to be used for testing.
* ***Upcoming***: Develop interface to communicate with hardware over a Bluetooth connection. Design user testing procedure, and method to objectively measure performance (accuracy of performing action, time taken, etc.)