

Assignment 1: Sampling and Processing Accelerometer Data: Step Counter

Develop a phone app that counts steps. Design an interface that shows the number of steps as a user walks with the phone in their hand. You will be using the raw data from the accelerometer to complete this task. The data will require some simple signal processing before you can count the number of steps. You can use peak detection, zero crossings, or your own technique for counting. Overall, refer to all the techniques we discussed in the class.

The app should also display the sensor data and/or processed data in realtime. If you make any assumption about the phone's orientation, your app should inform the user about the assumptions. **Optional** – If want a challenge, attempt to detect steps in any orientation and posture and run it as a service in the background. We won't give you extra credits, but maybe chocolate! 😊

Please have your application installed and ready to show during the office hours on the due date. We will post a sign-up sheet for demos soon.

Deliverables:

1. A demo before the class or during office hours.
2. Source code (an archive of the whole project folder)
3. Video(s) of the app
4. Very short description of your approach

Grade distribution:

70% performance

15% real-time data display

15% resilience to spurious data (e.g., user wringing hands)

For performance, as long as the estimate will be within 15% of my actual number of steps, you will get full credit, below that, you lose 10% grade for every 10% error. We will test the app on the instructor(s) and the student themselves, and grade the *best* performance.