

CAS765 Programming Assignment 3 – Step count

Due date: Nov 11th, 2013

In this assignment, you will develop an Android application that reports the number of steps a person has taken. A gait (step) cycle is defined as the duration from the moment a limb leaves the ground until it leaves the ground again 1. For a healthy human being, one gait cycle consists of two steps (one by the left leg and one by the right leg).

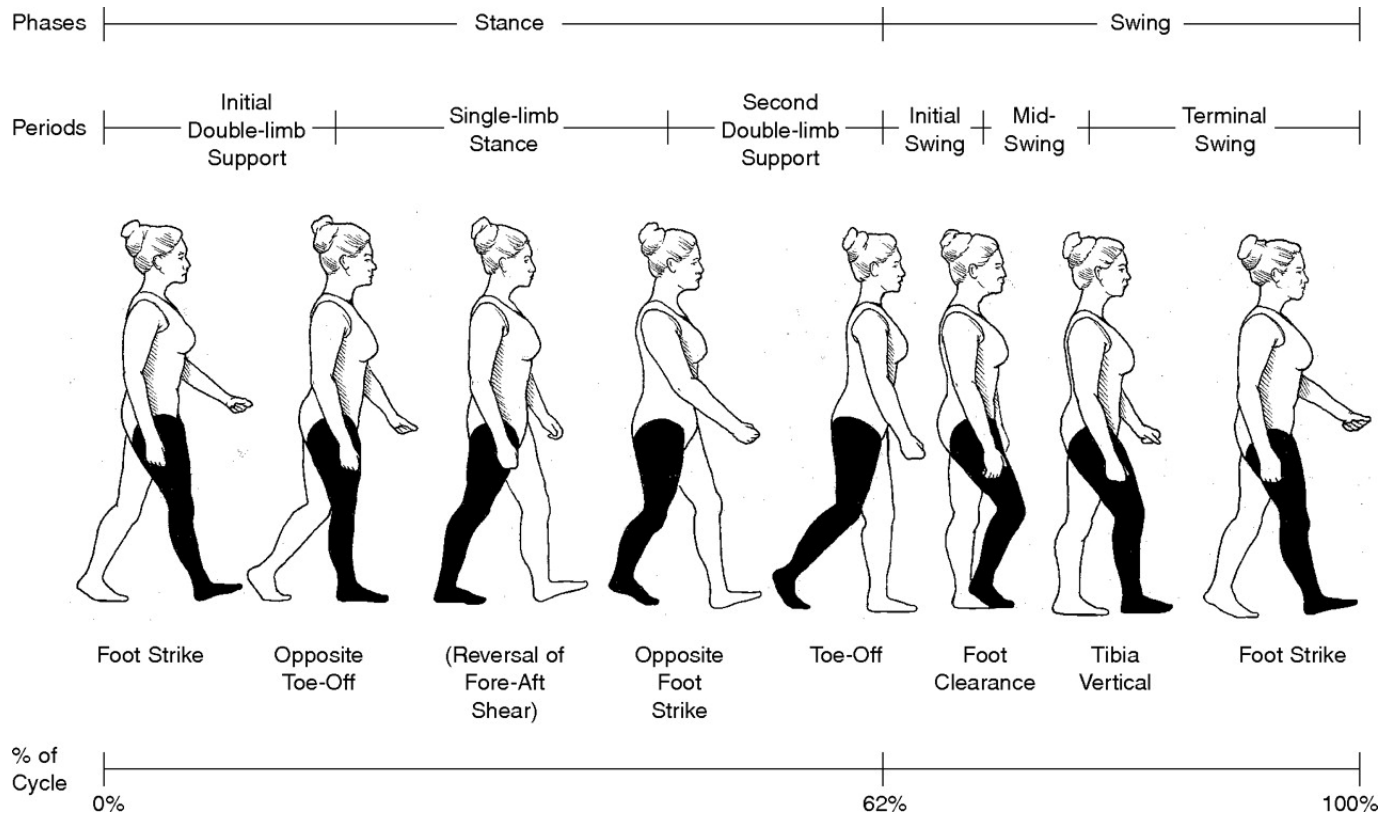


Fig. 1. One gait cycle consists of two phrases: a stance period and a swing period

Requirements: You may assume that the user holds the phone in her hand when running this application. However, the orientation of the phone may change over the course of walking. Users may walk fast or slow. The application should display the number of steps a user has taken since a “start” button is pressed. A “reset” button resets the count. Other UI elements are optional. The application should work *online*, namely, the step counts should be incremented as the user moves (though a few seconds of delay is acceptable).

Implementation: You can choose to implement any of the algorithms discussed in the class (e.g., papers MP13, JSPJ09, YSSLS07, LZDGLZ12), or ones you find in literature.

One probable approach is to record the sensor readings in trace files (this should have been accomplished in Program Assignment 2). You first implement and test your algorithm written in Java on a regular desktop using the trace files. Then, you port the program to Android and test it.

Report: In the report, you will describe the algorithm(s) implemented using both plain English and pseudo code. Provide quantitative results of the accuracy of the algorithm(s) over different test runs and different conditions (phone orientations, walking speed etc.). The use of charts is encouraged. Discuss the weakness of the approach and potential means to improve if any. Each group will give a demo, and a short presentation of their approach and results during class. The best performing team will receive bonus points. Email your code to the instructor in a tar.gz ball.