

AE498MPA (Fall 2007)

Homework 1: GPS Localization

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Due at 5PM on October 1, 2007

Basic assignment

Create an application that uses GPS data to show the following:

1. A map of campus.
2. The current position (point on the map).
3. The path followed (curve on the map).
4. The total distance traveled (text overlaid on the map).

A menu option will be available that saves the display (an image of the map, position, path, and distance travelled) to a `.jpeg` file. Satellite time and smoothed (x, y) position in UTM format will be logged to a `.txt` file, where each line has the form `t x y`. The application must be capable of using the provided campus map (other, better maps may be used in addition). It must also be capable of smoothing the position data with a recursive estimator (such as a Kalman Filter) and a dynamic model of user motion.

Contest

At 5PM on October 1, all groups will follow a pre-surveyed route around campus, starting from Engineering Hall. The group that reports the total distance traveled most accurately is the winner. (The winning group must also satisfy the basic assignment.) Each member of the winning group will receive a prize, as well as everlasting fame.

Deliverables

Submit an annotated python script (and any other code) and a brief summary of your solution approach (in particular, any innovative algorithms such as for map display, position smoothing, calibration, or user modeling). Also submit logged data from the contest. Within each group, all members will receive the same grade.