

SPU 26 Assignment 1 Due by Mon. Sept. 17th at time of Lecture.

Purpose: The purpose of this assignment is to establish a *baseline* for your navigational skills. How well can you hold a course and estimate the distance you've traveled with no special training? There is no prize for doing the best job of holding a course or getting the closest to the time estimate. The most important aspect is to honestly and accurately report the findings. Do not wait for the last minute to do this, as you might find yourself walking in inclement weather. If any part of this assignment is unclear, please check with Prof. Huth (huth@physics.harvard.edu, cell 617 594 6549).

Materials required

- 1.) A watch or means of keeping track of time (a cell phone works).
- 2.) ***At the END of the exercise:*** use Google earth (<http://earth.Google.com/>). Please do ***not*** consult a map until you've done steps 1 – 8. If you don't have Google Earth, you can download it onto your laptop or computer.

Instructions

- 1.) Do ***not*** consult a map or a GPS during steps 1-8 of the exercise, as this will bias the results. Do not consult a map in advance of the exercise. This has to be done entirely without aids. You can carry a map of Cambridge as a back-up ***for the end*** of the exercise, in case you find yourself in an unfamiliar place.
- 2.) Start at the statue of John Harvard in front of University Hall. Directly across the Yard from the statue is the Johnston Gate, which you will face if you have the statue directly behind you. Massachusetts Hall is the building just to the south (left as you face it) of the Johnston Gate. A line from the statue of John Harvard to the northwest corner (corner closest to Johnston Gate) of Massachusetts Hall is due west. **This is the direction you are to walk in and maintain (due west) as best you can.**
- 3.) When you are ready, **note the time, put away your watch or clock, and begin walking in the direction of Johnston Gate.**
- 4.) While walking, obey all local traffic rules (e.g. crossing with the light, walking in cross walks). This means you cannot hold a precise course, as you will have to make small detours. Nonetheless, every time you make a small detour, try to regain and maintain the direction that you started off in. Use sidewalks and areas where you're allowed to walk. You will likely have to detour around some buildings.
- 5.) Subjectively estimate the time, and when you feel that 20 minutes have elapsed, stop.
- 6.) **Immediately look at your watch or clock and note the time.** Note how much time has actually elapsed.
- 7.) **Get as accurate a reference to your position as you can.** This may entail looking for a nearby address, or hunting around for a street sign. Use as many clues as you can to accurately pinpoint your ending location – e.g. buildings, addresses the view of the scene.

- 8.) Estimate and make a note of how far you *think* you've traveled, as a **straight-line distance** from the statue to your ending location. This bears on your subjective sense of distance traveled.
- 9.) Return home (safely!). If you brought a map as a back-up, you may use this now. Ask for directions, if you need to.
- 10.) Using Google earth, find the location where you stopped.
- 11.) Using the ruler feature of Google earth or a map and ruler, find the distance from the statue to your ending location (straight line distance).
- 12.) Find the angle off of true west. Google earth's ruler will report the angle in degrees. Due west is 270° . If you ended up north of due west, make that a positive angle, if you ended up south of due west, make that a negative angle. (E.g. if you found you ended up at 271.8° , that's 1.8° off of due west and if you ended up at 265.3° , that's -4.7° off of due west.)
- 13.) Go to the course website, and under "Week 2", there is a data entry form that you can find by scrolling down. In this form enter your name, the actual time (in minutes), your estimated distance (in miles), the actual distance traveled (in miles) and the angle off of west (in degrees). Then hit "submit". Please report estimated and actual distances to two significant figures, at most.

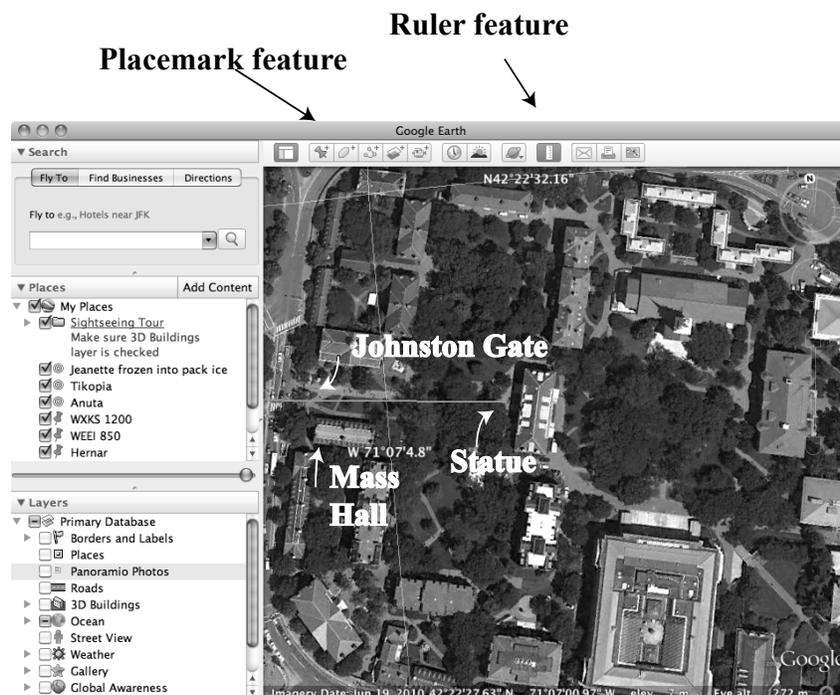


Figure 1 Screen shot of Google earth with additional text showing the ruler and place mark features, the John Harvard Statue, Mass. Hall and Johnson Gate.