

6.813/6.831 • User Interface Design and Implementation

Massachusetts Institute of Technology

Department of Electrical Engineering and Computer Science

Spring Semester, 2011

RS1: Experiment Implementation

Due Session 11

This problem set is for the graduate 6.831 class only.

This problem set is the first in a three-part series (RS1, RS2, RS3) in which you will reproduce a controlled experiment of a novel user interface technique from a published paper. In this problem set, you will implement the technique and the infrastructure that you'll need to run the experiment. In RS2, you'll actually run the experiment on some people and collect data. In RS3, you'll analyze the data using statistical tests.

Choose the Experiment

First, you should read the two research papers below:

- L. Findlater, K. Moffat, J. McGrenere, J. Dawson. "[Ephemeral Adaptation: The Use of Gradual Onset to Improve Menu Selection Performance](#)". *CHI 2009*.
- T. Grossman, R. Balakrishnan. "[The Bubble Cursor: Enhancing Target Acquisition by Dynamic Resizing of the Cursor's Activation Area](#)." *CHI 2005*.

Next, decide which experiment you will reproduce. Here are your choices:

- Experiment 2 from the Ephemeral Adaptation paper
- Experiment 2 from the Bubble Cursor paper

Your version of the experiment only needs two conditions: the control condition (the normal behavior of menus or mouse selection) and the experimental condition (ephemeral adaptation or bubble cursor respectively). The studies in the papers had a third condition (highlighting or object pointing,

respectively) that you **don't** have to replicate.

You may have to read some of the cited work in each paper to fully understand the interaction technique and the study design.

Implement the Experiment

Implement the software you'll need to run the experiment you chose. You can use any language or user interface toolkit that you want. Make sure your implementation includes everything you'll need to conduct the study:

- implement an interface that supports both the control and experimental conditions
- create a framework around the interface that allows for adjustment of experimental parameters for each trial, and shows each task to the user;
- makes appropriate measurements for each trial and outputs the raw data you'll need for analysis

Note that you don't need to run users, collect data, or analyze data for this assignment. You'll do that in RS2 and RS3. When you hand in this assignment, however, your software must be *ready* to run users. Also, your software doesn't need to do its own analysis or generate its own graphs. We'll use other tools for that. It just needs to record raw data in a form that will be easy to import into an analysis tool like a spreadsheet. CSV format is a good choice.

Make a Screencast on YouTube/Vimeo

Create a **screencast** that shows your software in action. The video should show:

- the control and experimental conditions in action;
- how tasks are presented to the user;
- examples of recorded data.

To create the screencast, you can use the free [CamStudio](#) on Windows or a trial version of [Snapz Pro X](#) or [iShowU HD](#) on Mac. Audio is not necessary, but brief screen captions saying what the video is showing are a good idea. Your video should be **at most 2 minutes** long.

Upload your video to YouTube or Vimeo, so that you can hand in just a link to it rather than the entire video file.

What to Hand In

Package your completed assignment as a zip file that contains all of your **source code**, plus an **executable version** if you wrote it in a compiled language like Java or Flash.

Also include a **README** file, in plain text or PDF format, that includes the following:

- A list of the people you discussed this assignment with. This is an individual assignment, so be aware of the course's collaboration policy.
- The URL of your YouTube/Vimeo screencast
- Platform requirements for your software, like operating system, web browser, or language version
- Instructions for running your software

Here's a checklist of things you should confirm before you hand in:

1. Make a fresh folder and unpack your zip file into it
2. Make sure your collaborators, if any, are named in the README
3. Make sure your code runs successfully in the fresh folder

Grading

This assignment will be judged on three dimensions:

- **Functionality (35%):** does it work?
- **Completeness and fidelity (35%):** does it include all the necessary elements to conduct an experiment, and will that experiment faithfully reproduce the experimental design published in the paper?
- **Presentation (30%):** does your handin (video, README, and zip file) make it easy to judge functionality, completeness, and fidelity?

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