CMSI 370-01
Interaction Design
Fall 2014

Assignment 1021

This assignment, already much-referenced in class, is meant to appeal to the other side of your brain while you are hacking away at some raw code. I recommend that you switch between them as a "break" from each assignment. Do *not* plan on doing them sequentially.

Outcomes

This assignment will affect your proficiency measures for outcomes *1a*, *1b*, *2a*, *2b*, *4d*, *4e*, and *4f*.

Background Reading

The following textbook readings will be helpful for this assignment, in addition of course to readings specific to your chosen topic:

- Norman Chapters 1 and 2
- Shneiderman/Plaisant Chapters 1 and 2
- Nielsen Chapters 2, 4, and 5

For Submission

Mental Model Research and Analysis

This year, we have a single overall topic, but apply it to one of three types of technology—technologies which, as a fun bonus, are explored somewhat in this year's Common Book, *The Circle* by Dave Eggers. Write a concise paper that addresses the usability issues that are particular to one of the three system types given below (i.e., choose one):

Wearable Devices

General-purpose computers continue to shrink, and can now reach sizes that make them "wearable"—watches, bands, glasses, shoes, etc. As more devices take on this form factor, how do their usability issues compare to conventional devices? What principles remain the same? What principles gain or lose importance?

Note the specific choice of words above: the idea of matching *mental models*, as the foundational notion of successful interaction design, necessarily remains the same. *Theories*, in their role as explanations for how users interact with devices, presumably also hold true. *Guidelines*, on the other hand, necessarily change, precisely because the devices themselves are different. Advanced proficiency papers on this topic will provide an up-to-date survey of wearable devices then address all of the aforementioned interaction design issues with regard to those devices. Needless to say, cite all information sources and choose them well.

Ubiquitous Devices: "The Internet of Things"

Similar but not identical to wearable devices is *ubiquitous computing*. Ubiquitous computing, or ubicomp for short, leverages the shrinking of general-purpose devices not by putting them *on you* but instead by putting them *everywhere*. The promise of this "Internet of things" includes lights or appliances that "know" when to turn on, refrigerators that can maintain your grocery list, or stores that can provide individualized promotions just for you at any given moment.

As with wearable devices, a paper on this topic should look at how interaction design principles may shift or differ with regard to ubicomp, keeping in mind that mental models and theories should play the same role while guidelines necessarily change due to the very nature of these devices.

Screens, Screens Everywhere (and of Every Size)

The final device to study is one that has actually been around for a while—but which, like general-purpose computers, are diversifying in multiple directions. Screens are getting smaller; lighter; larger (*way* larger)—all in terms of physical size, number of pixels, and use cases. They can become the ultimate customizable watch face, or with 4K and retina displays, the near equivalent of high-fidelity printed media. They may even cease to be rectangular or two-dimensional: flexible, bendable, rollable screens are also not that far away. Further, they display pretty much everything: entertainment, documents, biometrics, live feeds…with all this variety, the topic at hand can certainly apply. How do interaction design concepts specifically map to the usability of modern display technology?

Common Criteria

For all of the papers, you are expected to make effective use of the concepts learned in class to inform and enlighten your chosen topic. Are there guidelines documents that codify certain ideas explicitly? What principles or theories might come into play? Most of all, how do the issues in these topics relate to the way *mental models* are formed and communicated across developers and users? You are free to make a final call, but make sure to base your call on the material we have seen (and beyond!—don't hesitate to visit the library or find additional information sources for your work). And yes, regarding the library—see the end of this assignment write-up for additional motivation…

Recommended Outline

Most papers of this type follow the same general structure. Unless you have strong, justifiable reasons for diverging from this, stick with:

1. *Introduction*—Bring the reader into the topic: what is it about? Why does it matter? Are there any terms that you need to define right away? (the topic descriptions already given have the kind of tone expected in an introduction)
2. *Background/Prior Work/Literature Review*—No intellectual endeavor is an island. Every topic here comes with a wealth of previous work that can inform it—you just have to look. What has been said about your topic in the past? Who said it, and on what basis do they say it? Low-hanging fruit: start with the recommended textbooks. Beyond that, online resources such as the ACM Digital Library and IEEE Xplore will lead you to a wealth of sources. The Internet at large is also a resource, but keep a critical eye on the credibility and authority of what you find there. And oh yes—*try the library*.
3. *Methods*—The traditional title of this section is perhaps the most difficult to map to this paper; in other work, this is the section where you state "what you did" to investigate your topic. For this particular assignment, you can view this section as your "final roundup" of the information that you found—what work seems to be the most relevant or important? What have you chosen as the most authoritative information and why? What appears to be the prevailing set of views (which you will then tackle in the next section)? In a sense, "what you are doing" is reviewing all of the information that you have found, so that is what's expected in this section.
4. *Discussion*—This is the section where you bring in your own thoughts. Given what you have seen and learned, what do *you* think influences the topic the most? Do you agree or disagree with what the literature has stated, and why? Have you noticed something that the literature has not covered? This is the section for that.
5. *Conclusions*—OK, we're done, wrap up. Recap the topic, your key sources, what they said, and finally what *you* say. Readers should get a sense of what the paper is about just by reading this section—the rest of the work is detail.

Also, make sure that you lead off with an *Abstract*, then end with a *References* section for the work that you used and cited (these sections are not formally numbered, but they are as much a part of academic writing as the others). The *Abstract* is like an executive summary of the paper—it gives the reader a "preview" of what they are about to read. Pro tip: Write the abstract *last*, when your paper is all done. The *References* section should list all of the information sources that you used. On a practical level, it is there so that your readers can follow up or learn more about what you said. You must therefore put enough information in this section so that the reader can find your sources on their own.

How to Turn It In

For this assignment, *very strongly consider* using LaTeX to write the paper. With the need for proper references, figure management, clear sectioning, and others, this assignment truly plays to LaTeX's strengths. Of course, I am available to help you figure out anything that you are unable to do on your own. Commit your work to a folder called *mental-model-paper/* in your repository.

Entry Into LMU ULRA

If you use the services, resources, and collections of the William H. Hannon Library while working on your paper, you can enter it into LMU's annual *Undergraduate Library Research Award* (ULRA). Information about ULRA can be found here:

http://digitalcommons.lmu.edu/ulra

Three words: One. Thousand. Dollars.