

CSC 484 Lecture Notes Week 5

Social and Affective Aspects of Interaction Design

I. Relevant reading.

A. Textbook Chapters 4 and 5.

B. Next two research readings:

1. **"Using Model Checking to Help Discover Mode Confusions and Other Automation Surprises"**, by John Rushby, SRI International; the journal of Reliability Engineering and System Safety, vol. 75, no. 2, pp. 167--177, February 2002. (Slides of a talk on the paper are available at <http://www.csl.sri.com/~rushby/slides/hessd99.ps.gz> , in gzipped PostScript format.)
2. **"Looking at, Looking up, or Keeping up with People?: Motives and Use of Facebook"**, by Adam Joinson, the University of Bath School of Management; Proceedings of the SIGCHI conference on Human factors in computing systems, 2008, ACM.

C. About the research readings.

1. The papers are *not a pair*, as were the previous two readings.
 - a. The Rushby paper is most immediately relevant to Chapter 3.
 - b. The Joinson paper is most relevant to Chapters 4 and 5.
 - c. They investigate distinctly different aspects of interaction design.
2. About the Rushby paper:
 - a. It defines a very formal mental model, based on Rushby's extensive experience in formal methods.
 - b. The model focuses on a very specific problem -- that of airline pilot performance.
 - c. The modeling effort achieves some tangible results, in terms of changes identified to make a cockpit interface less subject to misinterpretation by pilots.
3. About the Joinson paper:
 - a. It presents a very general social study, of Facebook users.
 - b. The paper studies a very general issue -- that of web user "gratification".
 - c. The study achieves some qualitative results.
4. In both cases (Rushby and Joinson), the relevance to CSC 484 is primarily the research methodologies, not the specific subject matter.
 - a. We will not study either subject area in great depth.
 - b. In your 484 projects, you may build some form of semi-formal model, if it will be useful in your design efforts.
 - c. Regarding the Joinson paper, you will in fact do some basic demographic analysis, but generally not in the form of large-scale user questionnaires, a la Joinson.

II. Introduction to Chapter 4 (Sec 4.1).

- A. The chapter focuses on collaboration and communication among human users of interactive products.
- B. It addresses the social factors relevant to these areas of human interaction.
- C. The chapter also discusses newly emerging social phenomena, that have come about due to the introduction of new technologies, such as cell phones, the internet, and ubiquitous computing environments.

III. Social Mechanisms (Section 4.2).

- A. Understanding these mechanisms can help us design better interactive systems.
- B. The core mechanisms discussed in this chapter are
 1. *conversational* -- the flow of talking;
 2. *coordination* -- people working together;
 3. *awareness* -- who's doing what, where.

IV. Conversational mechanisms (Sections 4.2.1 and 4.2.2).

- A. The focus here is on human-to-human communication, not human-to-machine or machine-to-human.
- B. There are many intricate social rules that come into play when people converse.
- C. Also, new rules have emerged with new technology, e.g., texting and instant messaging etiquette.
- D. Designers of systems that support conversation must understand these rules.
- E. Occasionally designers invent new rules, either intentionally, or in many cases unintentionally, when people put communication technologies to uses that the designers did not foresee.

V. Coordination mechanisms (Sections 4.2.3 and 4.2.4).

- A. The book discusses these primary forms:
 - 1. Verbal and non-verbal communication.
 - 2. Schedules, rules, and conventions that facilitate human coordination.
 - 3. Shared external support, both electronic and non-electronic.
- B. Again, designers of systems that support collaboration must understand the mechanisms.
- C. Entire conferences and journals are devoted to *computer-supported collaboration work* (CSCW):
 - 1. The *ACM CSCW* conference, held every-other year since 1986.
 - 2. The Springer *CSCW* journal, published since 1992.
 - 3. The *IEEE CSCWD* conference, held yearly since 1996.
 - a. The "D" in CSCWD stands for "Design".
 - b. I.e., the conference is devoted to tools and techniques to support collaborative design specifically, e.g., among a team of architects.
- D. There have been some notable technological successes in the last couple decades, in particular
 - 1. electronic whiteboards and "cocktail napkins" (SIGCHI, 1996);
 - 2. multi-author shared document systems (CSCW, 1990).
- E. Both of these technologies have recently been productized by Google.

VI. Awareness (Sections 4.2.5 and 4.2.6)

- A. There are immensely complex cognitive and social mechanisms involved with human awareness.
- B. Assistive technologies need to provide support for human-to-human awareness, i.e., how multiple human users are made aware of one another in a collaborative computer-based environment.
 - 1. E.g., electronic whiteboard systems provide ways for users to share the common space effectively.
 - 2. Other electronic collaboration systems use and adapt non-electronic forms of human communication, e.g., group calendars, shared documents, and rules for "turn taking" during highly interactive communication.
- C. There is also recent research on computer-to-human awareness.
 - 1. These new technologies investigate ways to have computer-based systems be aware of human users.
 - 2. E.g., MIT media lab "smart rooms", that detect the presence and motion of people within the room.

VII. Techno-mediated social phenomena (Section 4.3).

- A. Based on the scant page-and-a-half of coverage, the book seems a bit overwhelmed here.
 - 1. It mentions the various new forms of human communication that have emerged with new technologies.
 - 2. For example, cell phones (with cameras), PDAs, and the myriad websites that provide world-wide communication and information sharing.
- B. The research reading for Week 6 studies one specific area of emerging communication and collaboration -- *Facebook*.

VIII. Introduction to Chapter 5 (Section 5.1).

- A. The chapter discusses *expressive* interfaces, i.e., ones that promote positive emotions :)[†]
- B. The chapter also discusses *frustrating* interfaces, i.e., ones that promote negative emotions :(
- C. They talk about persuasive technologies, used to draw people's attention to certain kinds of information.
- D. The controversial subject anthropomorphism is discussed, i.e., whether computer-based systems should try to exhibit human-like characteristics.
- E. Interface agents, virtual pets, and interactive toys are presented as recently emerging technologies.
- F. Finally, the chapter discusses theoretical models of human emotion and pleasure.

IX. What are affective aspects? (Section 5.2).

- A. These are things that generate an emotional response in people.
- B. The focus in Chapter 5 is on computer-provoked human emotion.
- C. Artificial intelligence researchers have done work on computer-expressed emotion, but this research is not addressed in the book.

X. Expressive interfaces (Section 5.3).

- A. Positive emotions can be promoted by common interactive forms such as icons and animations.
- B. Ostensibly, these are reassuring and positively affective.
- C. However, there is always a "however" -- one person's cute icon or animation is another person's highly annoying distraction.
- D. And there's an (over) abundance of research on the subject, e.g.,
 - "*Emoticons convey emotions without cognition of faces: An fMRI study*" -- strap an MRI coil around users' heads to see what goes on inside their brains as they look at emoticons (SIGCHI 2006).
 - "*Extraction and classification of facemarks*" -- methods for automatically extracting emoticons, in tools like text-to-audio translators (2005 conference on Intelligent User Interfaces).
 - "*HIM: A Framework for haptic IM*" -- how to convert visual emoticons into finger buzz (SIGCHI 2004).

XI. Frustrating interfaces (Section 5.4).

- A. The book provides the following suggestions for how to avoid designing frustrating UIs:
 1. *obey the principle of least astonishment*, i.e., simple tasks can be done simply and quickly, harder tasks are possible but can take longer.
 2. *follow decent guidelines*, e.g., Nielsen's heuristics that you used in assignment 1.
 3. *study flops* -- e.g., Microsoft Bob and Clippy, that were well-intended but not much embraced by users.
- B. The book's favorite frustrations are these:
 1. "Under construction" gimmicks in websites.
 2. Bad error messages.
 3. Too much waiting.
 4. Ill-designed software upgrades.
 5. Clutter.

[†] Recently turned 25

XII. Dealing with frustration (Section 5.4.1).

- A. The book's major suggestion for dealing with user frustration is to provide contextualized help.
- B. It also discusses the notion of apologetic computers ("*I'm sorry Dave, I'm afraid I can't do that.*").

XIII. Persuasive technologies (Section 5.5).

- A. The book offers a few examples, including Amazon's 1-click purchasing.
- B. In general, persuasion is *very hard*.
- C. Consider Bob Sutton's Stanford class, and the topic of the recent conference on "*Creating Infectious Action*".

XIV. Anthropomorphic interfaces (Section 5.6).

- A. These are much debated.
- B. *The pros*: UIs with human traits can be enjoyable and motivational.
- C. *The cons*: people like Ben Schneiderman say that such interfaces are at best misleading, at worst downright deceptive.

XV. Interface agents, virtual, interactive toys (Section 5.7).

- A. There have been many attempts to embody animate characteristics within interactive computer systems.
 - 1. The MIT media lab has done some interesting work in this area.
 - 2. Shameless commerce abounds in online virtual pet shops, e.g., adoptme.com.
- B. There is still much research and development to do.

XVI. Models of affective aspects (Section 5.8).

- A. Donald Norman has recently developed an *emotional design model*.
 - 1. There are three levels of emotional response-- *visceral, behavior, reflective*.
 - 2. Understanding things in terms of this model *may* promote better design.
- B. Patrick Jordan has proposed a *pleasure model*.
 - 1. He categorizes pleasure into four types -- *physio, socio, psycho, cognitive*.
 - 2. This model may help to frame designers' thinking.
- C. McCarthy and Wright have developed an *experiential framework*.
 - 1. It has four "threads" -- *sensual, emotional, compositional, spatio-temporal*.
 - 2. It may help designers think holistically about interaction design.