Main Area:
User Interface Design for Small Mobile Communication Devices

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Description

I am interested in the time when wireless communication devices will become so small that real estate for the user interface will be the main design issue. I envision a base wireless communication device that can fit easily, e.g., on a finger ring. How will the user interact with such a device? My current hypothesis is that the user interface has to be *modular* (user interface elements, either local worn on the body or part of the environment, are linked dynamically and wirelessly), *multi modal* (user and device both can select the appropriate input and output modes, e.g., speech, keyboard, vision, gesture), the device itself *context sensitive* (since user will likely perform other tasks simultaneously, having her undivided attention is not likely anymore, and therefore the device has to adapt and adjust the possible cognitive loads put on her), and probably a *content transcoder*.

Publications from the following three bigger areas could contribute to my main area:

- **Small devices user interface design**. Within this area, my focus is on non-conventional input and output options, e.g., mobil multimodal.
- **Mobile communications: devices and technologies**. Device specific studies, telecommunication related things.
- **Context**: psychological issues like divided attention, social and attentive state.

Written Requirement

The written requirement for this area will consist of a publishable quality paper.

Signature: _____ Date: _____

The online version of this reading list contains links to most of the papers, as well as some abstracts: ***http://www.media.mit.edu/~stefanm/generals/***

Reading list

The reading list is structured in three sub areas.

User Interfaces for Small Devices and Multi-Modality

Brad Myers, Scott E. Hudson, and Randy Pausch (2000). *Past, Present and Future of User Interface Software Tools*. ACM Transactions on Computer-Human Interaction ToCHI, 7(1), March 2000, pp. 3-28.

Gregory D. Abowd and Elizabeth D. Mynatt (2000). *Charting past, present, and future research in ubiquitous computing*. ACM Transactions on Computer-Human Interaction ToCHI, 7(1), March 2000, pp. 29-58.

Li Gong and Jennifer Lai (2001). *Shall We Mix Synthetic Speech and Human Speech? Impact on Users' Performance, Perception and Attitude*. ACM CHI 2001 Proceedings, pp. 158-165.

Jennifer Lai, Karen Cheng, Paul Green, and Omer Tsimhoni (2001). *On the Road and On the Web? Comprehension of Synthetic and Human Speech While Driving*. ACM CHI 2001 Proceedings, pp. 206-121.

Masaaki Fukumoto and Yosinobu Tonomura (1999). *Whisper: A Wristwatch Style Wearable Handset.* ACM CHI'99 Proceedings, pp. 112-119.

Masaaki Fukumoto and Yosinobu Tonomura (1997). *Body Coupled FingeRing: Wireless Wearable Keyboard*. ACM CHI'97 Proceedings, pp. 147-154.

Les Nelson, Sara Bly, and Tomas Sokoler (2001). *Quiet calls: talking silently on mobile phones*. ACM CHI 2001 Proceedings, 174-181.

Bernhard Suhm, Brad Myers, and Alex Waibel (1999). *Model-based and empirical evaluation of multi-modal interactive error correction*. ACM CHI'99 Proceedings, pp. 584-591.

Marilyn A. Walker, Jeanne Fromer, Giuseppe Di Fabbrizio, Craig Mestel, and Don Hindle (1998). *What can I say?: Evaluating a Spoken Language Interface to Email*. ACM CHI'98 Proceedings, pp. 582-589.

Sharon Oviatt and Philip Cohen (2000). *Multimodal Interfaces That Process What Comes Naturally.* Communications of the ACM, Vol. 43(3), March 2000, pp. 45-53.

Magnus Jacobsson, Mikael Goldstein, Mikael Anneroth, Jost Werdenhoff, and Didier Chincholle (Ericsson Research) (2000). *An Action Control but no Action: Users Dismiss Single-Handed Navigation on PDAs*. NordiCHI 2000, pp. 1-10.

Data egg. Web document, online at URL http://www.e2solutions.com/dataegg/ (local copy available)

Jakob Nielsen (1993). *Noncommand user interfaces*. An updated version of a paper that appeared in the Revised version of Communications of the ACM 36(4), April 1993, pp. 83-99, is available online at URL http://www.useit.com/papers/noncommand.html

Tarjin Rahman and Paul Muter (1999). *Designing an Interface to Optimize Reading with Small Display Windows*. Human Factors 41(1), 1999, pp. 106-117.

Jennifer Lai, David Wood and Michael Considine (2000). *The Effect of Task Conditions on the Comprehensibilty of Synthetic Speech*. ACM CHI 2000 Proceedings, pp. 321-328.

David B. Pisoni, Howard C. Nusbaum, and Beth O. Greene (1985). *Perception of Synthetic Speech Generated by Rule.* Proceedings of the IEEE 73(11), November 1985, pp. 1665-1676.

Donald A. Norman, Donald (1999). *The Invisible Computer*. Cambridge, MA: The MIT Press, selected chapters.

Context and Attention

Mark Weiser (1991). *The computer for the 21st Century*. Scientific American, Volume 265, Number 3, September 1991, pp. 94-104.

Bradley Rhodes (2000). *Just-In-Time Information Retrieval.* Ph.D. Dissertation, MIT Media Lab, May 2000, sections 3.1 and 3.3.

Allan Allport (1989) *Visual Attention.* In Michael Posner (ed.) Foundations of Cognitive Science, Cambridge, MA: The MIT Press, pp. 631-682.

Christopher D. Wickens (1992). *Engineering Psychology and Human Performance*, New York, NY: Harper Collins, chapter 3 (pp. 74-115) and chapter 9 (pp. 364-411).

Elizabeth D. Mynatt, Marybeth Back, Roy Want, Michael Baer, and Jason B. Ellis (1998). *Designing Audio Aura.* ACM CHI'98 Proceedings, pp. 566-573.

Nitin Sawhney and Chris Schmandt (2000). *Nomadic Radio: Speech & Audio Interaction for Contextual Messaging in Nomadic Environments.* ACM Transactions on Computer Human Interaction ToCHI, 7(3), Sept. 2000, pp. 353-383.

Philip E. Agre (2000). *Changing places*. To appear in Human-Computer Interaction 16(2-3), 2001, pp. 177-192.

Mobile Communications

Jason Pascoe, Nick Ryan, David Morse (2000). *Using while moving: HCI issues in fieldwork environments*. ACM Transactions on Computer-Human Interaction ToCHI, 7(3), September 2000, pp. 417-437.

Alan Dix, Tom Rodden, Nigel Davies, Jonathan Trevor, Adrian Friday, and Kevin Palfreyman (2000). *Exploiting space and location as a design framework for interactive mobile systems*. ACM Transactions on Computer-Human Interaction ToCHI, 7(3), Sept. 2000, pp. 285-321.

Orkut Buyukkokten, Hector Garcia-Molina, and Andreas Paepcke (2001). *Accordion Summarization for End-Game Browsing on PDAs and Cellular Phones*. ACM CHI 2001 Proceedings, pp. 213-220.

Christian Heath and Paul Luff (1998). *Mobility in collaboration*. ACM CSCW '98 Proceedings, pp. 305-314.

Johan Hjelm (2000). *Designing Wireless Information Services.* New York, NY: John Wiley & Sons, selected chapters.

Johan Hjelm, Cheng-Lin Tan, Laurent Fabry, Thierry Fanchon, and Frank Reichert (1996). *Building a UMTS User Interface*. Talk at the ACTS Mobile Communications Summit, Granada, 1996.