

HCCs ADVANCED TOPICS

AUTUMN TERM 2006

Week 4 Readings – tangible user interfaces

Rationale: tangible interaction is a key aspect of many types of ubicomp applications such as the ones you might be building for your projects. The links and papers below are meant to give you a broad introduction to the area as well as some conceptual ways of thinking about designing and analyzing tangible interfaces.

Procedure: ALL to do the following four activities in advance of class and be prepared to discuss

1. Overview:

Have a quick look at <http://www.ehornecker.de/Tangibles.html> - this gives a good overview of tangible interaction and collates many relevant links.

2. Read:

Ishii, H., and Ullmer, B. (1997) Tangible Bits: Towards Seamless Interfaces between People, Bits and Atoms. In Proceedings CHI'97, ACM Press, pp 234-241.

<http://portal.acm.org/citation.cfm?id=258715&coll=ACM&dl=ACM&CFID=29080518&CFTOKEN=28022349>

- This is one of the classic early 'tangible' papers. Hiroshi Ishii and his Tangible Media Group at the MIT Media Lab <http://tangible.media.mit.edu/> were one of the 'pioneer' groups exploring tangible interfaces.

3. Read:

Fishkin, K (2004) A taxonomy for and analysis of tangible interfaces. *Personal & Ubiquitous Computing* (2004) 8: 347-358

http://seattleweb.intel-research.net/people/fishkin/pubs_files/tui_fishkin.doc

- This is one example of some concepts, presented as a taxonomy, that might also help you think about your own tangible design work

4. Activity:

Bring along an object or device, or a photo or printout of an object or device, that has a tangible interface and be prepared to discuss the interface using Fishkin's taxonomy and also to critique if and how the taxonomy is useful. This could be something from your home or public space studies, or something you have come across in some other paper or research project eg following links below.

Additional resources if you are interested

Tangible interfaces wiki: <http://wiki.cct.lsu.edu/tangint/space/start>

Djajadiningrat, T. Wensveen, S., Frens, J., Overbeeke, K, Tangible Products: Redressing the balance between appearance and action. *Personal & Ubiquitous Computing* (2004) 8: 294-309

<http://www.itproducts.sdu.dk/djajadiningrat/publications/04DjajPUCRedr.pdf>

Ullmer, B. and Ishii, H. (2000) Emerging frameworks for tangible user interfaces. In “*Human-Computer Interaction in the New Millennium*”. John M. Carroll, ed.; Addison Wesley, 2001, pp 579-601.

<http://alumni.media.mit.edu/~ullmer/papers/tui-millennium-chapter.pdf>

Benford, S., Schnädelbach, H., Koleva, B., Anastasi, R., Greenhalgh, C., Rodden, T., Green, J., Ghali, A., Pridmore, T., Gaver, B., Boucher, A., Walker, B., Pennington, S., Schmidt, A., Gellersen, H., and Steed, A. 2005. Expected, sensed, and desired: A framework for designing sensing-based interaction. *ACM Trans. Comput.-Hum. Interact.* 12, 1 (Mar. 2005), 3-30. DOI=

<http://doi.acm.org/10.1145/1057237.1057239>

Sharlin, E., Watson, B. Kitamura, Y., Kishino, F., Itoh, Y. (2004) On Tangible User Interfaces, Humans and Spatiality. *Personal & Ubiquitous Computing* (2004) 8:

<http://www-human.ist.osaka-u.ac.jp/~ehud/Publications/on.humans.pdf>

Personal and Ubiquitous Computing Vol 8, number 5 2004 - special issue on tangible interfaces:

<http://www.springerlink.com/content/1f099wb5rpwt/?p=ff030c28fb0e40c69e5a199b87420277&pi=11>

(Uni of Sussex Library only holds 2005 onwards but if you are interested in a paper you might find a copy via Google Scholar or Citeseer or the author's webpage.)