Making the digital palpable

Büscher M. (2006) Making the digital palpable. In: Gazahli, M. and Ramduny-Ellis, D., Hornecker, E. and Dix, A. *Physicality. First International Workshop on Physicality,* Lancaster University, UK, 6-7 February 2006. Position papers. http://physicality.org

email: m.buscher@lancaster.ac.uk

Introduction

Physicality is not just a property of matter and bodies. It is also, importantly, an effect of interaction. People perceive physical attributes (e.g. temperature, smell), physical processes, behaviours, and affordance as they engage with environments, materials, other people, and technologies. In their interactions with matter neither the range of sensory stimuli nor the range of responses are fixed. Many sociological studies with scientists show how matter can be made to 'speak' in many different ways (Latour 2000) and how people can learn to register and interpret stimuli previously unknown or perceived as noise (see, for example, Genevieve Teil's study of trainee perfumists learning to distinguish a large array of smells, summarised in Latour 2004).

People employ a 'documentary method of interpretation', by treating actual appearances 'as "the document of," as "pointing to," as "standing on behalf of" a presupposed underlying pattern' (Mannheim, quoted in Garfinkel 1967) and tap into this stream of agency through 'experimental interactivity' (Rammert 1999).

Digitality is not the opposite of physicality. Digital processes are material: Transistors are rapidly switched on or off, fans cool processors, electrical currents activate display photons, etc.. But it is difficult for people to sense many important aspects of this materiality. With many phenomena and processes in the sciences, digital phenomena and processes share the characteristic that their material 'documentation' requires long chains of amplification or translation.

While software developers are very good at devising and deciphering such chains, most users of digital technologies are not. They cannot easily make digital matter 'speak' in a way they can understand or train their perceptual system to register and interpret sensory information and translations they may encounter. This seriously hampers the appropriation and of digital services and devices.

The practical achievement of palpability

How can designers make digitality and its affordances more palpable, that is, more available to people's senses? If palpabiltiy is not a property of an object but the outcome of interactions between human actors and material actants, digital technologies should seek to better support human-matter interaction. But to do so, designers need to know more about how this interaction is practically organised, and a series of further questions arises:

- What exactly does a documentary method of interpreting material activity involve? How do people and matter engage in 'experimental interactivity'?
- How do people (learn to) make matter 'speak' in ways they can understand? How do they (learn to) register and interpret new sensory stimuli?

- How much understanding and what kind of an understanding of internal structures and processes is necessary to be able to generate palpability in interaction with material actants?

In order to explore some of these questions I carry out video based ethnographic studies in a range of different settings, focusing on work, play, software development and use.

Work: a number of professionals are routinely concerned with making complex, very subtle, or hidden material processes palpable for themselves and others, for analysis, diagnosis or evaluation, to communicate with others about them and to enable a decision making process. For example:

- landscape architects engage in the assessment of proposed new developments (e.g. windfarms) and their effect on the experience of landscapes (Büscher 2006)
- ultrasound scanning nurses and parents-to-be are concerned with pre-natal care, including the assessment of the risks of physiological or genetic irregularities (Büscher and Jensen 2006)
- physicians, parents and nurses who care for prematurely born babies must carry out, and perceive the effects of, treatment meant to facilitate the development of the foetus/child
- emergency response personnel learn to 'read' and react quickly to the ways in which bodies exhibit the consequences of injuries and the ways in which material agents can cause danger (Büscher and Mogensen)

Play: A series of small pilot studies capturing how people play with things (sugar-sachets, unfamiliar prototypes, mechanical things) apparently absent mindedly, with no purpose, unconsciously interacting and learning about material ways of 'speaking', and training their sensitivities, extending Heidegger's notions of ready-to-hand and present-to-hand, with more playful, less purpose-oriented ways of engaging with material qualities and processes.

Development and use: I am a member of a team engaged in the participatory design of an open architecture that supports palpable computing (PalCom). As part of this work, my colleagues and I develop prototypes for use in the different work settings described above. I have collected video records of numerous occasions where developers or users actively make digital processes (or a lack of such processes) palpable, when engaging with these prototypes. A range of characteristics of the architecture are utilised, a range of methods, tools and tactics can be distinguished (Büscher et al 2006).

Towards more palpable computing

My empirical studies and insights from current sociological thinking about human-matter relations inform the design of palpable computing, which builds upon reflective or declarative methods to make digital processes more palpable. (Dourish 1995, Wuyts 1998, Andersen et al. 2005, Büscher and Jensen 2006, and Ingstrup 2005).

References

Andersen, P. et al. (2005) Open Architecture for Palpable Computing Some Thoughts on Object Technology, Palpable Computing, and Architectures for Ambient Computing. Ob-ject Technology for Ambient Intelligence Workshop, Glasgow, U.K. Proceedings of ECOOP 2005.

Büscher M., Christensen, M. and Wolff Olsen, J (2006) Code work: 'But why? I wanna know why!' Ethnographies of Code: Computer Programs as the Lived Work of Computer Programming, Workshop, Lancaster University 30-31 March 2006.

Büscher M. (2006) Vision in motion. *Environment and Planning A* 2006, volume 38(2) February, pages 281 – 299

Büscher M. and Jensen, G. (2006) Sound sight: Seeing with ultrasound. *Health Informatics Journal*. (forthcoming)

Büscher, M and Mogensen, P. (submitted to CSCW 2006) Design implications from a study of embodied conduct and movement in emergency teamwork. Draft available from m.buscher@lancaster.ac.uk

Dourish P 1995. Accounting for system behaviour: Representatoin, reflection and resourceful action. In *Proceedings of Computers in context*, Aarhus, Denmark, August 1995.

Garfinkel, H (1967). *Studies in ethnomethodology.* Polity.

Ingstrup, M. and Hansen, K.M. (2005). A Declarative Approach to Architectural Reflection. WICSA 2005

Latour, B 2004 How to Talk About the Body? the Normative Dimension of Science Studies. *Body & Society* 2004 10: 205-229.

PalCom project. http://www.ist-palcom.org/

Rammert W, 1999, "Weder festes Faktum noch kontingentes Konstrukt: Natur als Produkt experimenteller Interaktivität. (Neither fact nor contingent construct: Nature as the product of experimental interactivity)" *Soziale Welt* 50 (3) 281-296.

Wuyts R. 1998 Declarative reasoning about the structure of object-oriented systems. In *Proceedings of TOOLS-USA*, 1998.