

Look Mama, *with* Hands!

ON TANGIBLE INTERACTION, GESTURES AND LEARNING

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Introduction

In recent years, tangible user interaction (TUI) has attracted attention among researchers, who have come to see the screen, keyboard, and mouse interaction with present computers as limiting. Although humans have developed sophisticated skills in the recognition and manipulation of objects over thousands of years, the displays and push buttons of today's electronic products far from exploit these skills. Current electronic products emphasise sequences of digital inputs that mirror the underlying software control structure, while exploiting only a very limited range of cognitive and motoric skills. Although some interfaces of this genre are simple to use, many are limiting and frustrating. 'Skill' in using electronic products is more about executing fixed recipes than about honing of our motoric ability (Maeda, 1999). Yet there is evidence in the literature that the physical use of objects improves the learning process (Brereton 1998). If we assume that by using TUI we can leverage the user's motoric ability to improve the learnability, usability and experience of interactive products, this leads to questions such as:

- How do motoric and cognitive skills develop as we use and manipulate tools and interfaces?
- What makes actions scalable along the learning curve, i.e. which actions allow us to improve our skills through practice to become 'pros' without creating a threshold which excludes novices?
- What makes physical interaction an interesting, beautiful or fun experience, thus enticing users to further polish their skills?
- How do we successfully map actions to functionality?

TUI design is still a young field, and the term is used to cover a broad range of design approaches. The purpose of this research workshop is to bring together researchers to explore relationships between TUI, learning and functionality, and—if possible—to establish a framework for TUI approaches.

Program

1. *Introduction to physical interaction and learning*
2. *Designs: Show & tell*

Participants demonstrate their own example of tangible user interface design, either 'live' or by means of video. Grouping of approaches to tangible interaction design.

3. *Gestures: Act & imitate*

In groups of four, participants present an object they have brought along and that they are expert in handling. A novice tries to imitate. Both expert and novice are recorded on video.

4. *Matrix of skills*

Teams present gestures and discuss whether these are learnable, scalable along the learning curve, interesting, beautiful, fun etc. Video images are grouped and projected as a 'matrix of skills', which runs all day (Buur & Søndergaard 2000).

5. *Design & tinkering*

Based on favourite gestures and design approaches, the teams work on a small design assignment, using a variety of tinkering materials provided by the organisers (Hummels et al., 2001). Teams act out product use, using gestures and props.

6. *Group discussion*

- What does tangibility mean for learning and vice versa?
- How do we improve the fit between actions and functions?
- Can we categorise approaches in tangible interaction?

Outcome

The result of the workshop is presented as a videoposter at the conference. It shows excerpts of both novice and pro gestures, grouped and annotated as they were during the workshop by the participants.

References

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