Hybrid interaction on interactive surfaces

Medieninformatik Hauptseminar Sommersemester 2009 „Interactive Surfaces“
Outline

- Terms/Making of/Concept Structure
- What is hybrid interaction on interactive surfaces (Hybrid Interaction) good for?
- Examples
- Perspective
- Literature
- Questions, Thanks and Bye
Terms

- Tangible User Interfaces (TUIs) are user interfaces in which physical objects are used to represent and control computational abstractions [1].

- Hybrid interaction i.e. across physical and digital information [2]
Making of TUIs

- A New Peripheral for Three-Dimensional Computer Input [3]
- Hiroshi Ishii’s "Tangible Bits“ [4]
- Urban planning: A Luminous-Tangible Workbench for Urban Planning and Design [5]
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Concept Structure

- Touch sensitive surface
  - Touch displays
  - SmartSkin [7]
- Projection System
  - SecondLight [8]
  - Computer vision
  - reacTable [9]
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Fig.4: SmartSkin sensor [7]
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What is Hybrid Interaction good for?

- Support learning
- Support human work
- Support teamwork
Learning

- Using physical laws [10]
  - Learning by playing
  - predict the effects of various actions

- “Scaffolding”[9]
  - Visual and voice feedback
  - Encourages the right decision making

- Easy moving from simulations to abstract model[12]
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Working

- Better performance and organization
- Focus on the work
- Easy information sharing
- Collaboration
Focus on the work

- Using both hands for interaction simultaneously [14]
- Using interactive instruments without visual control [14][15]
- Merge physical and virtual instruments/documents [16][18]
  - Teamwork: funktional distribution
  - Anoto Pen
- Easy planning [3][5][17]
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Fig. 13: Interaction with the 3D PhotoLens[14]
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**Fig. 14:** SLAP Widgets. a: Keypads, b: Knob, c: Slider, d: Keyboard[15]
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*Fig.15: Voodoosketch [16]*

*Fig.16: Anoto pen interaction [16]*
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Collaboration: easy information sharing
Perspective

Bringing Hybrid Interaction near to our everyday's life

Making technology more mobile
Literature


[2] Lucia Terrenghi in *Designing hybrid interaction through an understanding of the affordances of physical and digital technologies* (C&C’07)


[4] Brygg Ullmer, Hiroshi Ishii in *Tangible Bits: Towards Seamless Interfaces between People, Bits and Atoms* (CHI’97)


[6] Ryoichi Watanabe, Itoh Yuichi, Masatsugu Asai, Yoshifumi Kitamura, Fumio Kishino, Hideo Kikuchi in *The soul of ActiveCube: implementing a flexible, multimodal, three-dimensional spatial tangible interface* (ACE ’04)

[7] Jun Rekimoto, in *SmartSkin: an infrastructure for freehand manipulation on interactive surfaces* (CHI’02)

[8] Shahram Izadi, Steve Hodges, Stuart Taylor1, Dan Rosenfeld, Nicolas Villar, Alex Butler, Jonathan Westhues in *Going Beyond the Display: A Surface Technology with an Electronically Switchable Diffuser* (UIST’08)


Literature


[13] Jakob Leitner, Michael Haller, Kyungdahm Yun, Woontack Woo, Maki Sugimoto, Masahiko Inami in IncreTable, a mixed reality tabletop game experience (TEI’09)


[18] Jürgen Steimle in Designing Pen-and-Paper User Interfaces for Interaction with Documents (TEI’09)

[19] Tom Bartindale, Jonathan Hook, Patrick Olivier in Media Crate: Tangible Live Media Production Interface (TEI’09)
Questions?
Thanks!
Bye.