

Introduktion til interaktionsdesign 2009

Lektion 6



Læringsmål

Forstå interaktionsmodaliteter i digitale artefakter og ...
relatere disse til Dourish' begreb om embodied interaction

Særlig fokus på

Tangible computing

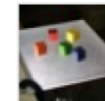
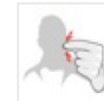
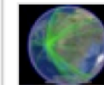
Mobile computing

Synkinestetetic computing

Skabe forudsætninger for undersøgelse af modalitet / interaktionsformer for jeres egen designopgave

projects

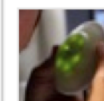
2009



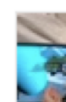
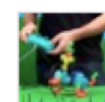
2008



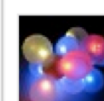
2007



2006



2005



Indhold

Interfaces / Modaliteter: kinestik, tangible interface
... (= embodied interaction – Dourish)

Synkinestetisk interaktion

Teori og baggrund

Weiser: Tangible Computing

Dourish: Embodiment

Eksempler / Projektinspiration

11:00 Pause

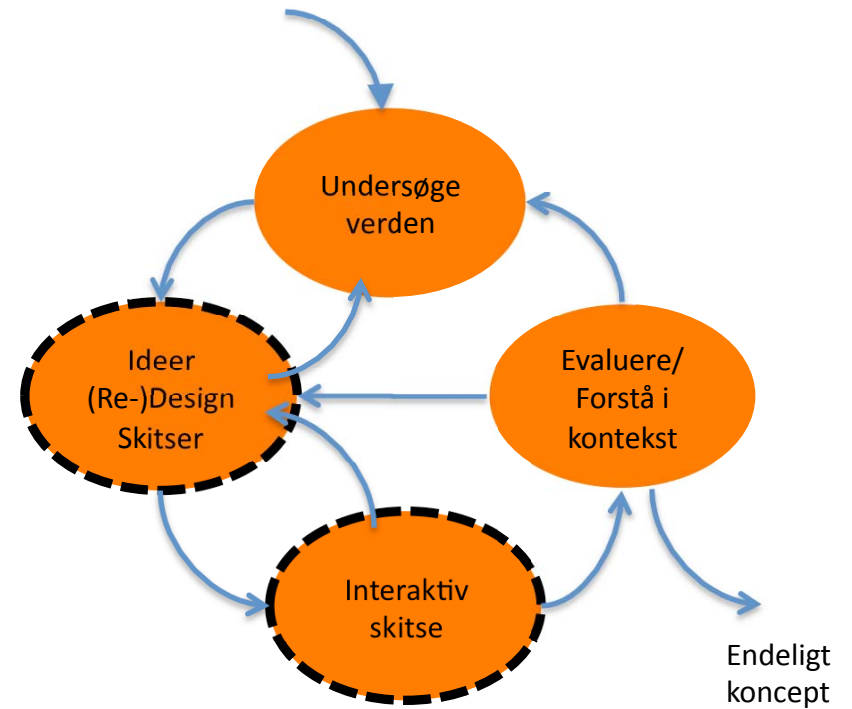
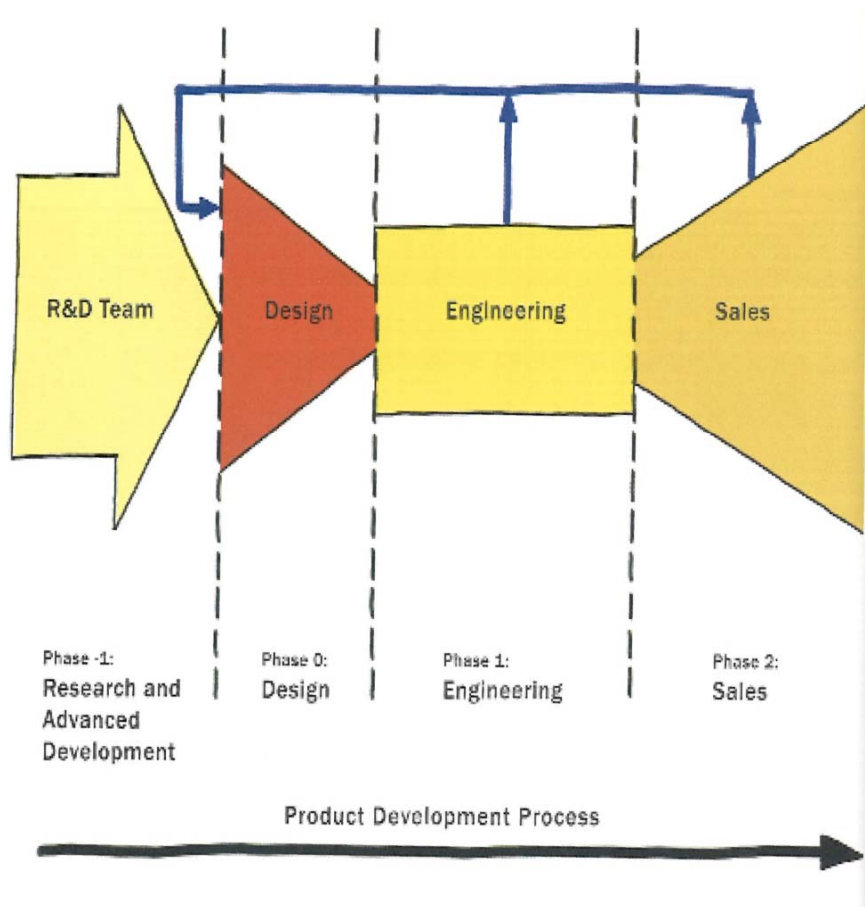
Midtvejsevaluering

Exemplarium (13+14)

Øvelsesintro



Designprocessen



Modaliteter / interaktionsformer?

Input / output?



Interface types

1980s interfaces

Command

WIMP (Windows, Icons, Menus and Pointer) / GUI

1990s interfaces

Advanced graphical (multimedia, virtual reality, information visualization)

Web

Speech (voice)

Pen, gesture, and touch

Appliance

2000s interfaces

Mobile

Multimodal

Shareable

Tangible

Augmented and mixed reality

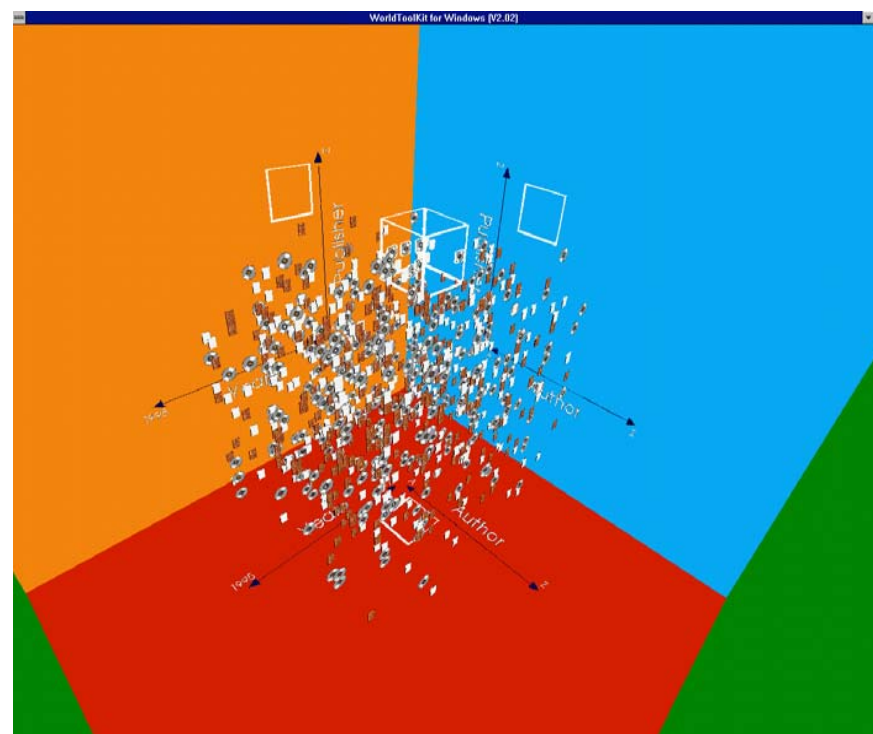
Wearable

Robotic

Det virtuelle bibliotek – navigering i store datamængder



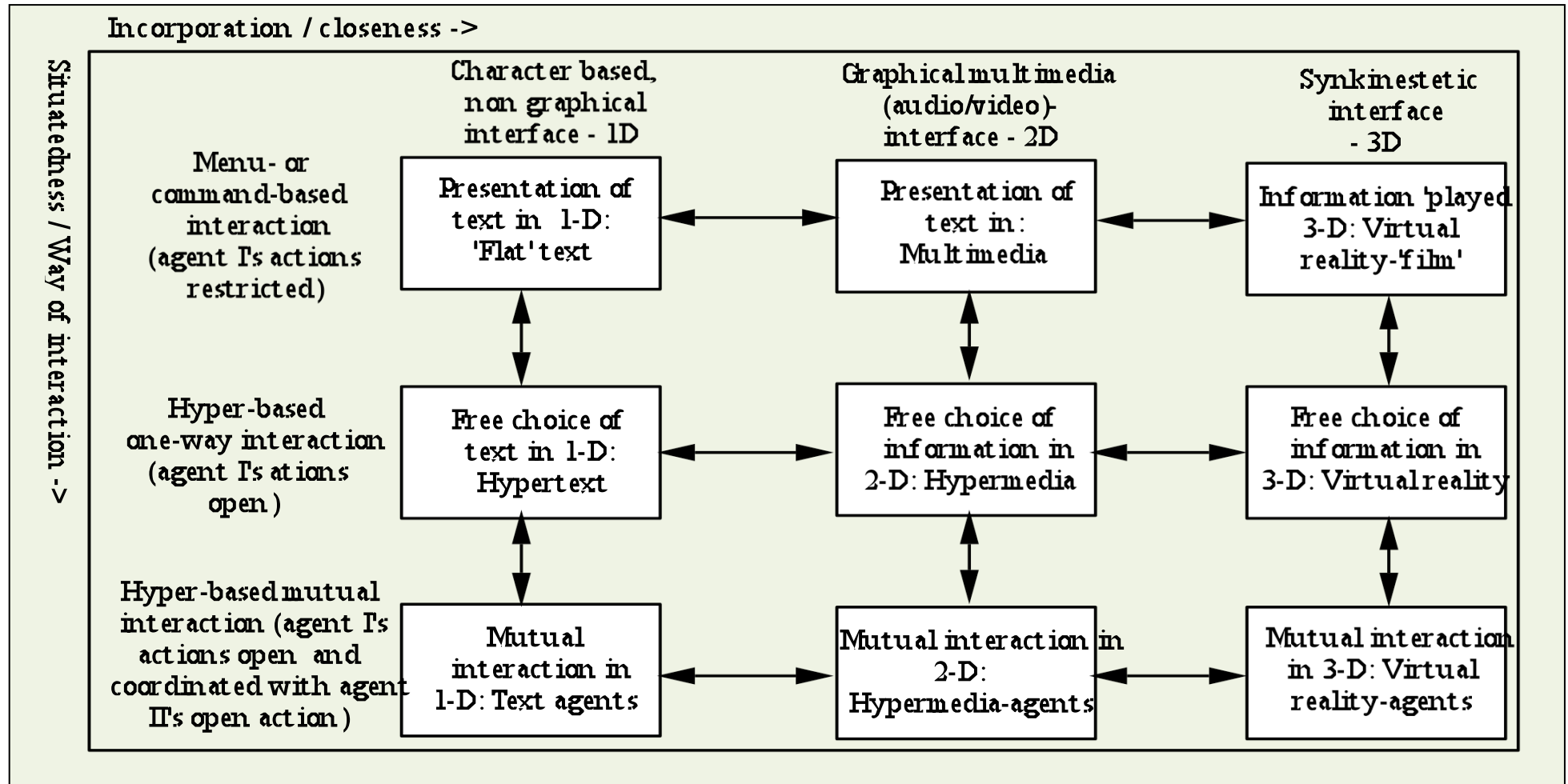
HMD fra Virtual Research: 3000\$, opløsning på 479 x 234 pixels. 3D-mus og tracker.



Et eksempel på swarm-mode i Det virtuelle Bibliotek (1995)
2009: MIT [G-stalt](#)

Synkinesthetic interaction [embodiment]

O. F. Kirkeby & L. Malmberg: Imagination as an approach to interactive multimedia. First International Conference on Cognitive Technology, 24-27 August 1995, Hong Kong. Published in: Barbara Gorayska (ed.): Cognitive Technology, Human Factors in Information Technology Series, North Holland/Elsevier, 1996.



Tangible computing- paradigme

Begrebsafklaring

Ubiquitous computing

Pervasive computing

Context-aware computing / location-
based systems

...

Social computing

Theory and Foundations

Paul Dourish: Where the Action is

Kap 2: Getting in Touch

*Embodied Interaction is interaction with computer systems that occupy our world, a world of **physical** and **social** reality, and that exploit this fact in how they interact with us*

Embodiment denotes a form of participative status

A history of HCI and interaction paradigms

electronic

symbolic

textual

graphical

...

A history of conceptual & theoretical models

incorporating new human skills and abilities

incorporating new ways of understanding their use

Two Recent Trends

“Tangible computing”

physical interaction

augmented environments

computation as part of the physical world

...”the way we experience the everyday world” (phenomenological approach)

“Social computing” (25/11)

using social understandings of interaction

enhancing interaction with computation

Tangible Computing

Origins in *Ubiquitous Computing*

Mark Weiser: ...“the computer for the 21st century” (1991)

invisible computing (paradox), “the disappearing computer program”

computation moves into the environment

interface moves into the environment



Tangible Computing

new set of design concerns

- managing attention

- incorporating context

- combining devices

- new physical forms and affordances

- new interactive styles

computation by ...

- the inch (electronic tags / computational “post-it”)

- the foot (stylus-based interaction, digital paper)

- the yard (wall-sized devices, Liveboard)

examples of tangible designs?

why tangible?

Tangible Computing

A 'historical' view ...

Wellner's Digital Desk (1993)

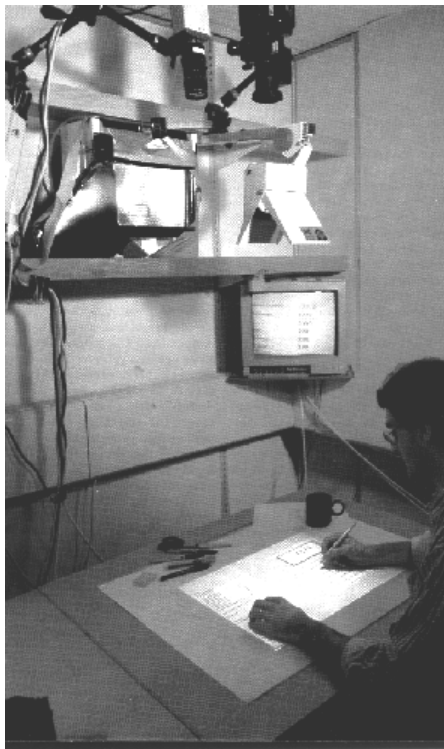
Jeremijenko's Live Wire (1994)

Bishop's Marble Answering Machine (1995)

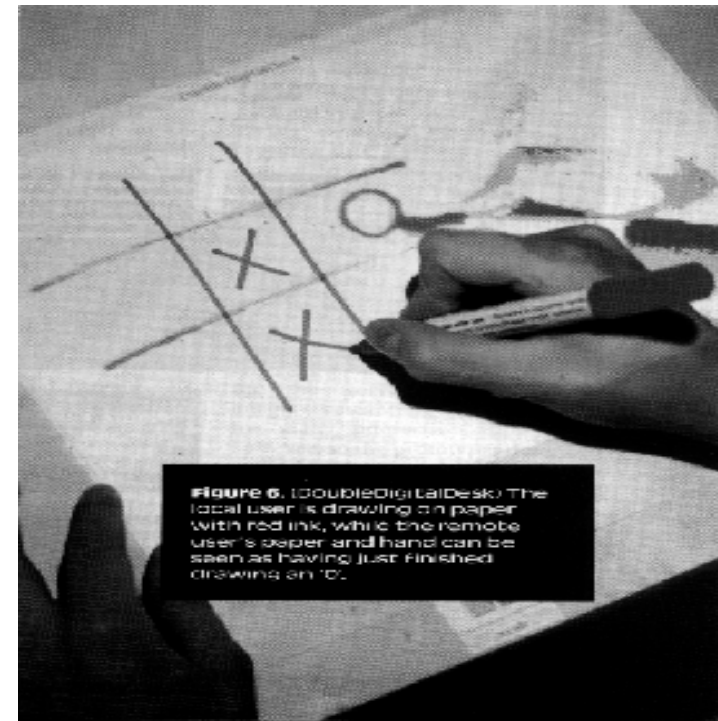
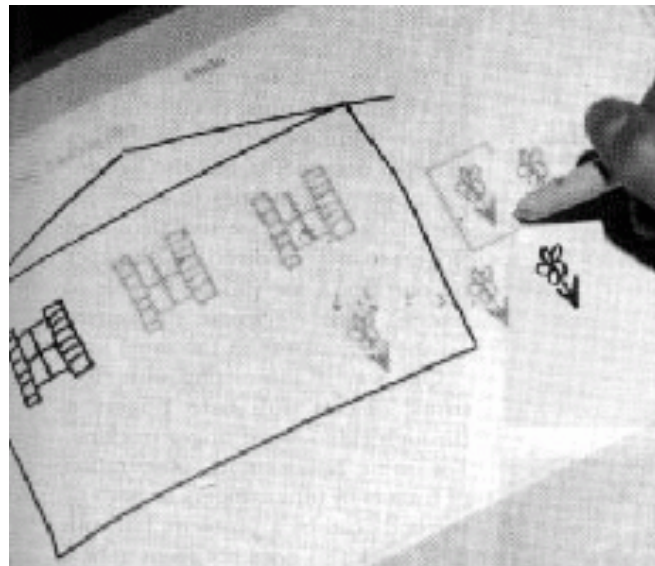
Tangible Computing

Wellner's digital desk (1991)

interaction with paper and electronic documents



Lone Malmborg



BIID Lektion 6

Tangible Computing

Jeremijenko's "Live Wire" (1994)
bridging physical and virtual



Tangible Computing

Bishop's Marble Answering Machine (1995)
physical interaction with digital information
(coupling bits and atoms)



MIT tangible bits program

Ullmer & Ishii: Tangible Bits (1997)

Tangible bits -> tangible media

[Examples / projects](#)

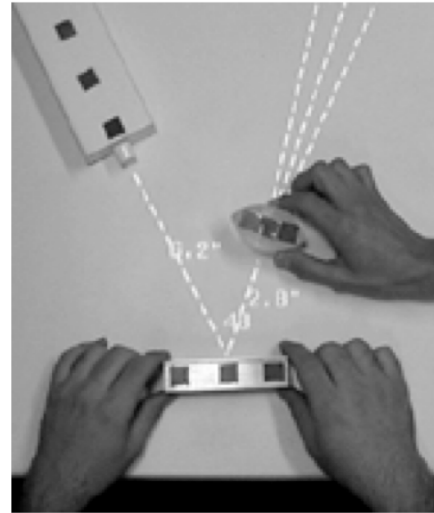
Lyt til Ishii på Youtube (Stanford lecture):

[Tangible Media for Design and Inspiration](#)

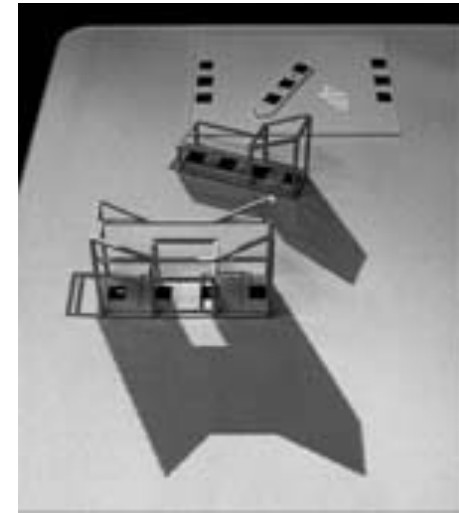
Tangible Computing



metaDESK



Illuminating
Light



Urp (1999)

Metadesk (Ullmer & Ishii 1997, TB, MIT)

Illuminating Light (Underkoffler & Ishii 1998, TB, MIT)

Urp (Underkoffler & Ishii 1999, TB, MIT)

Eksempler fra Dourish -> se <http://tangible.media.mit.edu/>

Own examples of tangible computing

Atelier: tangible archive + DesignLab - tagging

Psst! Tangible sound toys

PaperWorks: augmenting pen and paper

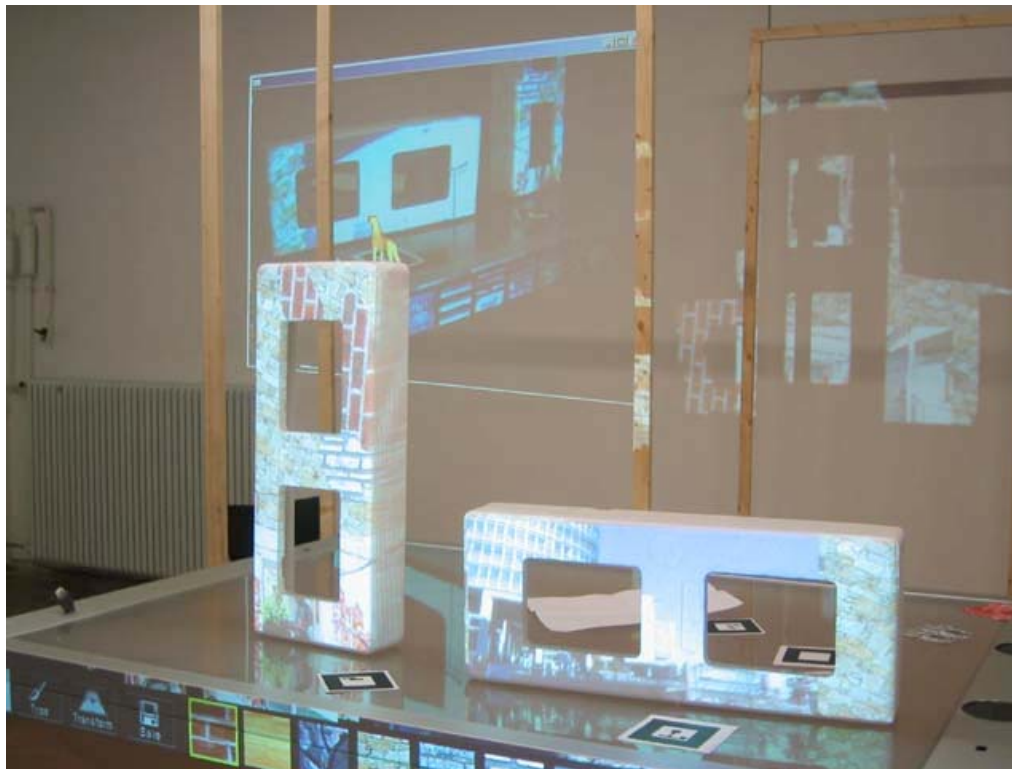
Mobility and learning environments:
ubiquitous tangible language

SPOPOS project

Students' work

Your examples?

Atelier



Co-wall / tangible archive
Texture painter

...

The aim of the ATELIER project (Architecture and Technology for Inspirational Learning Environments) is to contribute to inspirational learning environments, which are grounded in an understanding of creative practices within design, architecture and art.

Psst!



The Programmable Soundscape Toy

Paperworks

Augmenting pen and paper

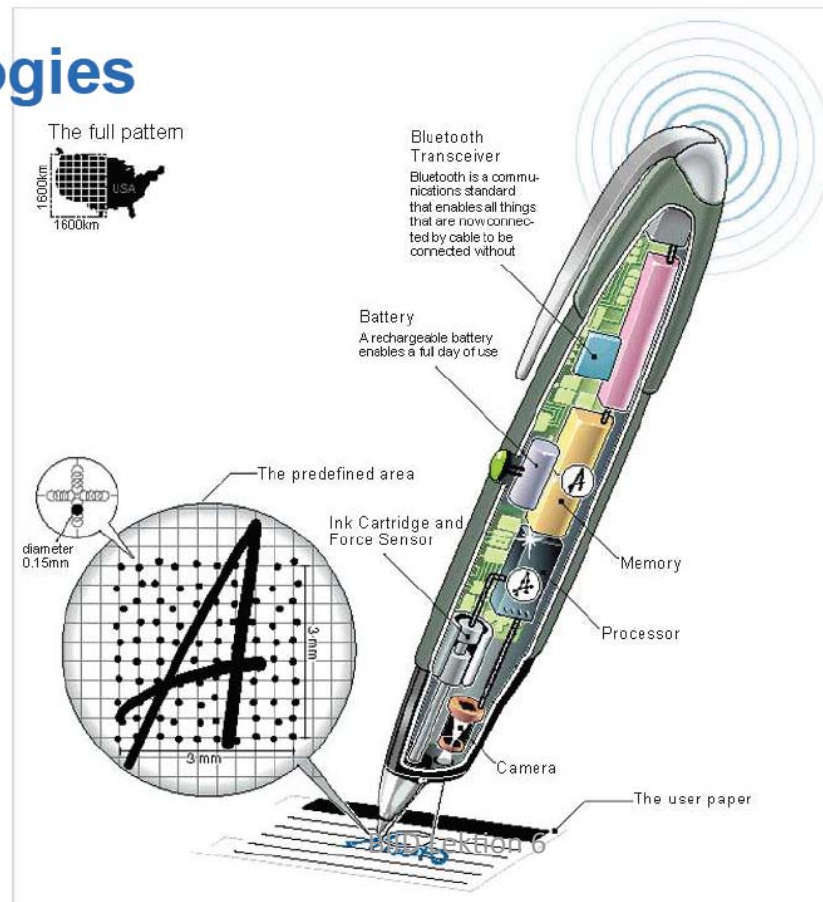


Anoto Technologies

virtual paper space
of 60 million km²

Pen manufacturers
Sony Ericsson
Logitech
Nokia
Maxell

Lone Malmborg



Situated probing - CHI2006, Montreal

Lone Malmborg

Bodil Jönsson

Arne Svensk

Mobility and Learning Environment

engaging people in design of their everyday
environment

Mobility and Learning Environment - from abstract to tangible living

methodological problems of engaging users in design

ethnographic approaches + cultural probes

flexible learning situations that fit users' needs

Tryckolera: activity centre for people with reduced cognitive abilities

CP processes: surprising observations and important ideas for future design

access to our own and our co-designers' thoughts

understand needs / wishes of people affected by decisions in design process

inclusive design for mobile learning & communication

two groups of people:

- 1: limited verbal language abilities, need to convey experiences non-verbally

- 2: students, need for access to different media in an open, flexible environment

establish a situated design process

Tryckolera – the environment

25-75 pictures pr day

Movies every day

Library contains 80.000 pictures +
100 movies

Variety of inspirational environments
to create illustration, interest and
affection

In-door, out-door, themes, planning,
problem solving ...



Tryckolera – design aims

From activity environment to
learning environment

Abstraction

Reflection

Self-confidence

Continuity

Contact with network

Ubiquitous language



Concluding remarks

transcend well-established practices and habits

view very familiar situations and environments in a new way

question established concepts of whom is capable of initiating and contributing to a design process

CP elucidate who own the questions, issues and problems

'Non-verbal' methods like CP have a great potential in letting people with cognitive difficulties have an important role in the design process

CP helped us to design the ubiquitous language for people with cognitive and language difficulties



Students' work – K3/Malmö

Kremlan (Livia Sunesson, 2001)

Tabletop Wireless Tracking System (Nichlas Nilsson, 2002)

FISH - a robot to help emotional development in autistic children (Tove Blomgren & Anders Tenggren, 2003)

Kremlan



I studion

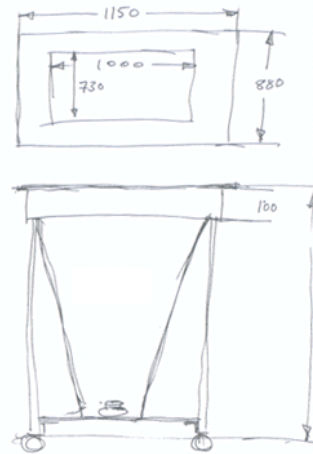
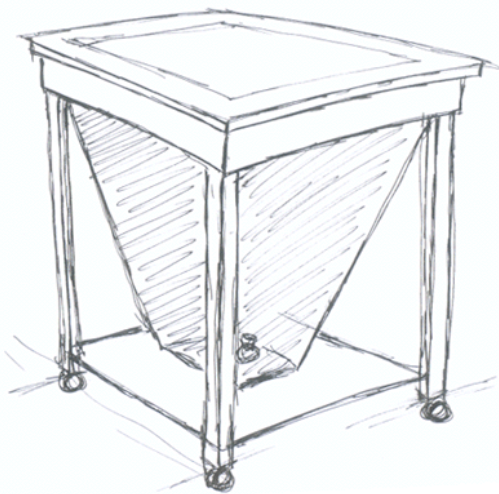


På Snoezelen



Livas website / portfolio:
<http://tallponies.net/livia/portfolio.html>

Tabletop Wireless Tracking System for composing / sampling music



FISH - a robot to help emotional development in autistic children
Tove Blomgren & Anders Tenggren, 2003

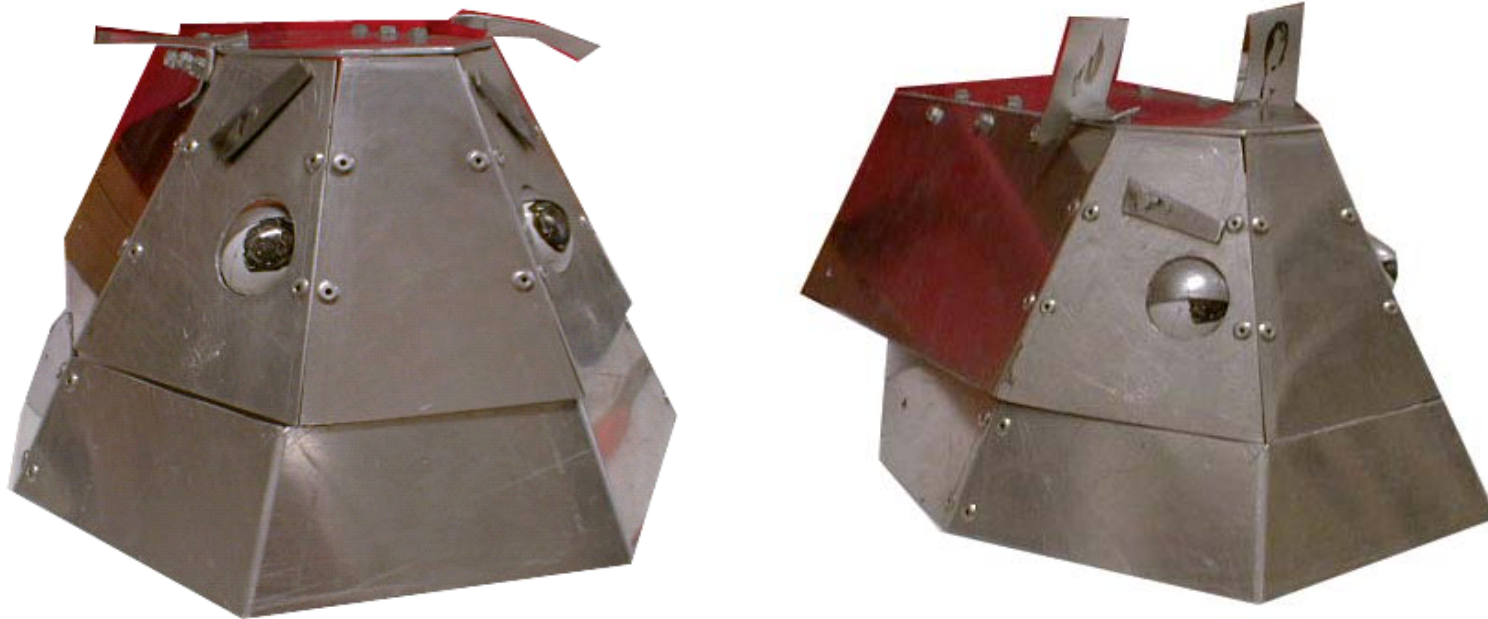


Fig 1. First prototype - without skin



Jeres eksempler ...

Features of Tangible Computing

Physical mappings

- physical objects rather than abstract entities

- specificity and specialisation (focused and task-specific)

Exploiting physical affordances

- suggesting and guiding action

Distributed interaction

- interaction across a range of objects

- interaction spread throughout a space

- moving beyond enforced sequentiality

Embodiment

Embodiment in physical computing

Embodiment in social computing

Embodiment is...

- the nexus of presence and practice

- a feature of engaged participation with the world

- a pre-ontological apprehension of the world

- (‘see and understand’ rather than ‘understand and see’)

Dourish conclusions

Embodiment is a foundation for new HCI models

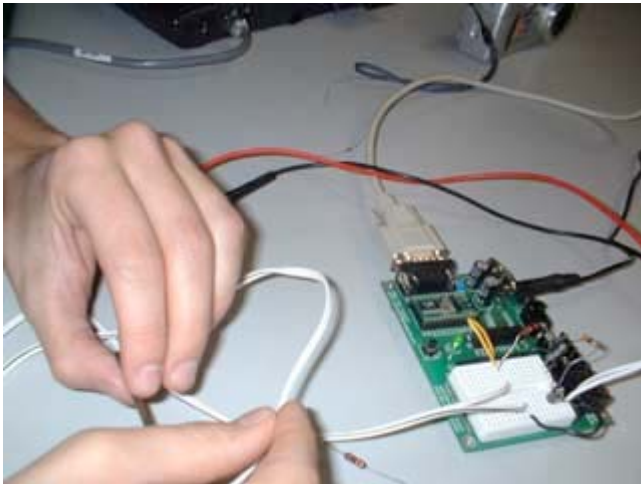
- tangible and social computing

- a common focus on participation and meaning

Turning to phenomenology

- a conceptual understanding of embodiment

Inspiration - et interaktionsdesign statement

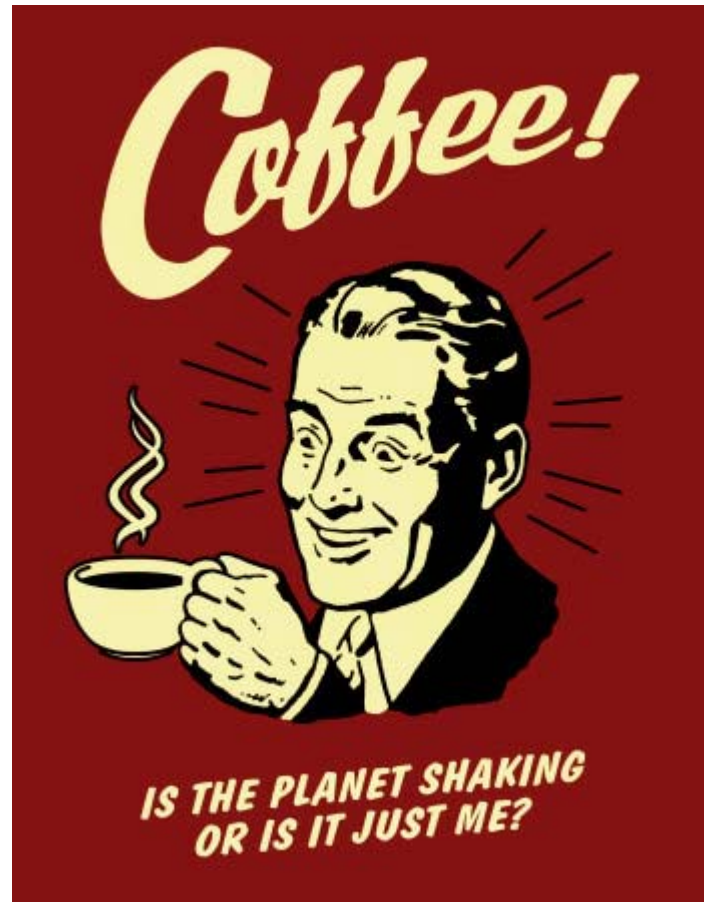


Although digital technology is becoming increasingly personal and intimate, electronic artefacts and systems are often conceived of as tools, designed to support goal-oriented tasks and activities as efficiently as possible. The Digital Peacock Tails project looks beyond this narrow point of view and employs digital technologies not only as efficient tools but also as beautifully challenging plumages



Digital Peacock Tails
Designing Post-Optimal Electronic Attire

Pause



Evaluering

Forelæsningerne

Øvelserne

Bloggen

Kurset som helhed

Andet

Exemplarium

Øvelse