Interface Aesthetics Week 2
Tangible User Interfaces
- Homework
- Designing interaction
- Tangible user interfaces
- In-class exercise
Homework
HOMEWORK

Objects from your childhood
Aesthetic quality (form, functionality, colors, texture, smell, etc.)
What is interaction design?
“How do you do?”
“How do you feel?”
“How do you know?”

[Verplank, 2001]
“How do you do?”
“How do you feel?”
“How do you know?”

[Verplank, 2001]
User interfaces: The current state of affairs
Eyes are in charge and hands are underemployed

[McCullough, 1996]
Eyes are in charge

Eyes guide tools, read notations, appraise designs. Eyes see wholes, and compare many objects simultaneously.

[McCullough, 1996]
Hands bring us knowledge of the world
Hands bring us knowledge of the world

They are the most subtle, sensitive, probing, differentiated, and the most closely connected to the mind. They deserve to be admired.

[McCullough, 1996]
Hands are underrated
By pointing, by pushing and pulling, by picking up tools, hands act as conduits through which we extend our will to the world.

[McCullough, 1996]
Eyes activate the hands, and hands direct the eyes.
Eyes activate the hands, and hands direct the eyes. Hand-eye coordination distinguishes humanity as the maker of things: *homo faber.*

[McCullough, 1996]
Hand-eye skills [adopted from McCullough, 1996]

- **Eyes-in-charge**
  - Coarse, discrete
    - Detecting events
    - Sorting coins
    - Forcing objects
  - Fine, continuous
    - Detecting traffic/flow
    - Sculpting
    - Playing music
    - Knitting

- **Hands-in-charge**
TANGIBLE USER INTERFACES

Tools
Tools
Deep in our nature, we are tool users as well as symbol users.
Hand-eye skills [adopted from McCullough, 1996]

- **eyes-in-charge**
  - **coarse, discrete**
    - mechanical tool users
      - typing with a keyboard
  - **fine, continuous**
    - information tool users
      - pointing with a mouse

- **hands-in-charge**
Tools
Aesthetics of the tools lost in the flood of PCs.
Combining the skillful hand with the reasoning mind

Computers let us turn the table—to apply something we know about using tools to achieve richer symbolic processing.

[McCullough, 1996]
Tangible User Interfaces
TANGIBLE USER INTERFACES

At the border
At the border
At the border
We live on the border where bits meet atoms. In the flood of pixels from the ubiquitous GUI screens, we are losing our sense of body and places.

[Ishii, 2006]
Coincidence of input and output spaces
TANGIBLE USER INTERFACES

Curlybot

[Frei, Su, & Ishii, 2000]
TANGIBLE USER INTERFACES

Topobo
[Raffle, Parkes, & Ishii, 2004]
Coincidence of input and output spaces
Tabletop TUI
Coupling tangible representations to digital information and computation
TANGIBLE USER INTERFACES

Urp
[Underkoffler & Ishii, 1997]
TANGIBLE USER INTERFACES

Illuminating Clay

[Piper, Ratti, & Ishii, 1999]
TANGIBLE USER INTERFACES

AudioPad

[Patten, Recht, & Ishii, 2004]
Augmented everyday objects
Embodiment of mechanisms for interactive control with tangible representations
Music bottles
[Ishii et al., 2000]
MUSIC BOTTLES
I/O Brush
[Ryokai, Marti, & Ishii, 2004]
I/O BRUSH
Tangible User Interfaces

TUI vs. GUI
TANGIBLE USER INTERFACES

**TUI**
Tangible bits
Coincidence of input and output space

**GUI**
Painted bits
Generic remote control
TANGIBLE USER INTERFACES

TUI vs. haptic technology
TANGIBLE USER INTERFACES

TUI

Haptic
technology

Coincidence of input and output space

Mechanical simulation of touch
Tangible User Interfaces
Tangible User Interaction Loop [Ishii, 2006]

1st loop with immediate tactile feedback

2nd loop through digital computation

3rd loop by actuation by a computer

physical actuation
digital

sensing
tangible representation = control & actuated display

intangible representation (video/audio feedback)
display

information / computation
TUI interaction loop
Combining the skillful hand with the reasoning mind
In-class exercise
IN-CLASS EXERCISE

Reinvent a childhood object

Think about its aesthetic qualities but also its constraints.

How could you improve it? How can you combine the skillful hand with the reasoning mind? Apply something of what we know about using the tools to achieve richer symbolic processing.
IN-CLASS EXERCISE

Process
1. Break into groups
2. Discuss your childhood objects (5 min)
3. Brainstorm about reinventing / retrofitting childhood objects (10 min)
   • What’s the goal?
   • Who it is for?
   • Meaningful interaction loop?
4. Pick one object (5 min)
5. Refine and mockup (20 min)
6. Present (30 min)
Week 3

Ambient media
Homework for week 3
Think about the most “peaceful” place and the most “chaotic” place (in the real or a virtual world) and describe their attributes.
Homework for week 3
Post your blog entry
by next Monday, March 19th
12 noon.
Thanks!