Digital Augmentation of Existing Familiar Objects

Principle of Tangible Interface Design

Bottles 99   I/O Brush 04
Augment

Digital Augmentation of Existing Familiar Objects

Principle of Tangible Interface Design

Bottles 99  HandSCAPE 00  I/O Brush 04
TouchCounters: Interactive Electronic Labels for Physical Containers (Yarin and Ishii 99)

“Distributed visualization of usage history”: Physical objects and surfaces that display their history of use
TouchCounters: Interactive Electronic Labels for Physical Containers (Yarin and Ishii 99)

Measure
HandSCAPE 2000
Jay Lee, Victor Su, Hiroshi Ishii

transparent
“The Computer for the 21st Century”

“The most profound technologies are those that disappear. They weave themselves into the fabric of everyday life until they are indistinguishable from it.”

Mark Weiser
July 23, 1952 - April 27, 1999

musicBottles
Ishii, Fletcher, Mazalek, Lee, Choo, Berzowska, Paradiso, 98-00

- Glass bottles as "containers" and "controls" for digital information
- Seamless extension of metaphors and physical affordances into the digital domain

Jazz       Techno       Classical       Weather
musicBottles (jazz)

musicBottles (techno)
musicBottles (classical)

Origin: Weather Bottle

present for my mother
soy sauce bottle
in her kitchen
The new standard in medication packaging

GlowCaps™

Paint
I/O Brush: Motivation: Colors Around Kids

- Appreciating richness of their surrounding colors, textures, and patterns
- Identifying and working with personal material that are meaningful (Papert, 1980; Resnik, et al., 1999)

I/O Brush
Kimiko Ryokai, Stefan Marti, & Hiroshi Ishii

- Explore patterns of colors and textures through familiar materials
- Your environment as a color palette to draw with
I/O Brush
Kimiko Ryokai, Stefan Marti, & Hiroshi Ishii

Explore patterns of colors and textures through familiar materials
I/O Brush (video)
Kimiko Ryokai, Stefan Marti, & Hiroshi Ishii

• Draw with colors, patterns, and movements

I/O Brush History Mode
Kimiko Ryokai, Stefan Marti, & Hiroshi Ishii

• From where the ink came from?
I/O Brush History Mode
Kimiko Ryokai, Stefan Marti, & Hiroshi Ishii

• Capturing and weaving the (hi)story for every stroke

I/O Brush Exhibition
at the Ars Electronica Center

September 2004 ~ August 2005
The World as the Palette
Colors in Barcelona

summary
Tangible Bits

- Giving physical forms to digital information and computation, making bits directly manipulable with two hands
- Continuity between physical and digital representation in design
- Supporting multi-user collaboration and “tangible thinking”

Painted Bits (GUI) and Tangible Bits (TUI)

Graphical User Interface
- Intangible representation (pixels on a screen) +
- Generic input devices as “remote-controllers”

Tangible User Interface
- Tangible representation as interactive control mechanism to manipulate the information and computation
- Continuity between physical and digital representation in design
Tangible Bits

• Reconciliation of our dual citizenship in the worlds of bits and atoms.
• Interaction Design
  – informed by sciences (HCI),
  – materialized by technologies (CS, EE, ME), and
  – shaped by industrial design, media arts and practical real-world applications.

My Research

Vision
Concepts, Principles

Applications
users, task, evaluation

Enabling Technologies