Tangible User Interfaces in Context and Theory

Workshop held in association with ACM CHI 2007, San Jose CA. Saturday, 28 April 2007

- Chair:
  - Alan Blackwell, Cambridge University
- Position papers
  - Alissa Antle, Simon Fraser University
  - Lorisa Dubuc, Cambridge University
  - Darren Edge, Cambridge University
  - Steve Hinske, ETH
  - Lars Erik Holquist, Viktoria Institute
  - Michael Horn, Tufts University
  - Hiroshi Ishii, MIT Media Lab
  - Angela Chang, MIT Media Lab
  - Jamie Zigelbaum, MIT Media Lab
  - Pamela Jennings, CMU
  - Paul Marshall, Open University
  - Yvonne Rogers, Open University
  - Thomas Pederson, Umea
  - Rob Jacob, Tufts University
  - Orit Shaer, Tufts University
  - Audrey Girouard , Tufts University
  - Erin Treacy, Tufts University
  - Leanne Miller, Tufts University
  - Lucia Terrenghi, LMU University of Munich
- Industrial cases:
  - Beverly Harrison, Intel
  - Wendy Leung, Anthony Majoros, Boeing
  - Jukka Linjama, Nokia

NOKIA
Connecting People

Message for TUI workshop: Research challenge

- Metaphors for interaction
  virtual input events + haptic feedback

- Match user research (HCI) to technology
  - Possibilities and constraints
  - Technology drives!

New interactions -- Tap & Kick

acceleration sensing + vibration feedback

- Bouncing ball game
- “Elen” interaction test system
- Nokia 5500 Sport phone

Workshop group discussion summary, 29.4.2007

collected by Steve Hinske, edited by JL

- Jukka:
  - Demos introduced: bouncing ball game + vibra, image turn + vibra (Elen device), music player pause/play by tapping twice (5500). Also turn down to silence sound.
  - Metaphors for input and output is a key challenge
  - In future, acceleration sensor will be in very many devices (billions)
  - It is impossible to expect users to come up with the what forms of interaction they want /need / prefer
  - Feedback: essential part of the interaction. Haptic feedback preferred over sound feedback as this channel is available
  - Feature development: Technology provider -> application developer -> end users. However, end users will invent the ways how to creatively (mis)use features or functionalities. Ultimately, develop "new languages" on top of the basic interaction vocabulary offered
  - Tapping is a robust interaction form. However false detections cannot be avoided fully. Challenge is that if recognition usually works, but suddenly fails in a critical situation, this is extremely annoying.
  - Features are not used if they require activation or configuration
- Can do more with haptic input: drumming, tap communication, …
- There are many situations where you cannot see the device, or do not want to unlock keys
- Touch sensing also often available
  - Confusion between touch taps and motion tapping
- Latencies are an important issue.
- Actions needed:
- "vocabulary" of (basic) interaction forms (JL)
- Use frameworks / metrics to map physical action with digital action / representation (JL)
- Critic: metaphors not always necessary, other approaches needed (Alan)
- What is the "reference" for mobile devices? Will the back/front always be back/front?
- Features should/could be user configurable
  - Anyway the default must be very good mapping
- Idea: use **containers** with different meanings: "tap twice at position X means different things with different containers
- Idea: using body location as context – shoulder = business, breast = family (Hiroshi)
- Idea: make areas of interaction visible – "tap here"
- Critic: is added functionality actually asked for? (except for entertainment, games…). Cannot get rid of the keyboard totally.
- Idea: squeezing of the device as input
- Idea: personal tapping rhythm as ID, …