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
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
• 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 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, ...