Haptic technologies in mobile devices
Maria Paananen
4th of November 2008
Content

1. Introduction
2. Haptics technologies in use
   - Dome
   - Vibra actuators
   - Piezo
   - Combinations
3. Possibilities in future
4. Thank You
1. Introduction

• Haptics are growing area in mobile business
  • Along with touch screens
• Different kind of solutions made in touch mobile phones
  • Introduction for some of them later in this presentation
• Personal thing in mobile device
• Cultural differences
2. Haptic Technologies
**Dome**

- Layer under touch screen
- Clicks down, when user presses anywhere on the screen

**Pros**
- Feedback is safely given from everywhere
- Cheap technology

**Cons**
- Feedback also from inactive areas
- Same feedback everywhere
- Can feel like screen is broken (specially in Asia)
Vibra

• Vibra Motors can be situated different places in device and this affects to the touch sensation

• Pros
  • Feedback can have different kind of patterns
  • Can be modified by intensity, rhythm, duration,

• Cons
  • Takes time to start up -> not so sharp
  • The whole device is shaking
  • Reliability e.g. delay

Typical vibrating alert motor (Picture from Emilia Koskinen’s thesis)
Examples of vibra devices

- LG KU990

- Nokia 8500 Xpress
Piezo actuator

• Piezo actuators are situated under touch screen
• The size of actuators can vary
• At the moment, best technology in usability vise

• Pros
  • The feedback is given under finger, so it is localized
  • The surface can feel different in different areas
  • Fast start up, quick and sharp feedback possible

• Cons
  • Needs good performance capacity

Figure 14. Piezoelectric actuators. Sizes 2.5 × 40 mm, 4 × 40 mm, 5 × 40 mm and 7 × 53 mm. (Picture From Emilia Koskinen’s Thesis)
Combined technologies

- Vibra and piezo
  - Can be used together
  - Allows differentiation of touch feedback and other alarms etc.
- Force sensing and vibra motor
Future ideas

• Electrizity