User Experience Design I
(Interaction Design)

Day 9 (July 4th, 2019, 9am-12pm):
Interaction Beyond the Desktop
This lecture is focusing on four types of interaction “beyond the desktop”:

• (1) Shareable interfaces
• (2) Wearable interfaces
• (3) Robotic interfaces
• …

Tangible, Embedded and Embodied Interaction (TEI)
(1) Shareable interfaces

- Shareable interfaces are designed for more than one person to use
  - provide multiple inputs and sometimes allow simultaneous input by co-located groups
  - large wall displays where people use their own pens or gestures
  - interactive tabletops where small groups interact with information using their fingertips

source: [8]
Advantages

• Provide a large interactional space that can support flexible group working
• Can be used by multiple users
  • can point to and touch information being displayed
  • simultaneously view the interactions and have same shared point of reference as others
• Can support more equitable participation compared with groups using single Laptops/Mobile Devices
Research and design issues

• More fluid and direct styles of interaction involving freehand gestures
• Core design concerns include whether size, orientation, and shape of the display have an effect on collaboration
• Horizontal surfaces compared with vertical ones support more turn-taking and collaborative working in co-located groups
• Providing larger-sized tabletops/displays does not improve group working but encourages more division of labor

source: [8]
(2) Wearable interfaces

• First developments was head- and eyewear-mounted cameras that enabled user to record what seen and to access digital information
• Since, jewellery, head-mounted caps, smart fabrics, glasses, shoes, and jackets have all been used
  • provide the user with a means of interacting with digital information while on the move
• Applications include automatic diaries and tour guides

source: [8]
"If history is any indication, we should assume that any technology that is going to have a significant impact over the next 10 years is already 10 years old!"

Bill Buxton
Steve Mann - pioneer of wearables

Steve Mann’s “wearable computer” and “reality mediator” inventions of the 1970s have evolved into what looks like ordinary eyeglasses.
Research and design issues

• Comfort
  • needs to be light, small, not get in the way, fashionable, and preferably hidden in the clothing

• Hygiene
  • is it possible to wash or clean the clothing once worn?

• Ease of wear
  • how easy is it to remove the electronic gadgetry and replace it?

• Usability
  • how does the user control the devices that are embedded in the clothing?
Skinput 2010

https://www.youtube.com/watch?v=g3XPUdW9Ryg
Skintrack 2016

https://www.youtube.com/watch?v=9hu8MNuvCHE
(3) Robotic interfaces

Four types

• remote robots used in hazardous settings
• domestic robots helping around the house
• pet robots as human companions
• sociable robots that work collaboratively with humans, and communicate and socialize with them – as if they were our peers

source: [8]
Advantages

• Pet robots have therapeutic qualities, being able to reduce stress and loneliness

• Remote robots can be controlled to investigate bombs and other dangerous materials

source: [8]
Zume Pizza Robot

Research and design issues

• How do humans react to physical robots designed to exhibit behaviours (e.g., making facial expressions) compared with virtual ones?
• Should robots be designed to be human-like or look like and behave like robots that serve a clearly defined purpose?
• Should the interaction be designed to enable people to interact with the robot as if it was another human being or more human-computer-like (e.g., pressing buttons to issue commands)?
Summary: Which interface?

• Is multimedia better than tangible interfaces for learning?
• Is speech as effective as a command-based interface?
• Is a multimodal interface more effective than a monomodal interface?
• Will wearable interfaces be better than mobile interfaces for helping people find information in foreign cities?
• Are virtual environments the ultimate interface for playing games?
• Will shareable interfaces be better at supporting communication and collaboration compared with using networked desktop PCs?

source: [8]
Summary: Which interface?

• Will depend on task, users, context, cost, robustness, etc.

• Much system development will continue for the PC platform, using advanced GUIs, in the form of multimedia, web-based interfaces, and virtual 3D environments

  • Mobile interfaces have come of age
  • Increasing number of applications and software toolkits available
  • Speech interfaces also being used much more for a variety of commercial services
  • Appliance and vehicle interfaces becoming more important
  • Shareable and tangible interfaces entering our homes, schools, public places, and workplaces

source: [8]
General Summary

• Many innovative interfaces have emerged post the WIMP/GUI era, including speech, wearable, mobile, VR/AR and tangible UI’s
• Many new design and research questions need to be considered to decide which one to use
• Web interfaces are becoming more like multimedia-based interfaces
• An important concern that underlies the design of any kind of interface is how information is represented to the user so they can carry out ongoing activity or task

source: [8]
References: