

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
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Tangible, Embedded and Embodied Interaction (TEI)

source: [8]

(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

Saint Luke's Hospital OF KANSAS CITY



<https://float4.com/en/projects/saint-lukes-hospital-media-wall/>

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.



source: [8]

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?

source: [8]

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

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

<https://thespoon.tech/wp-content/uploads/2017/01/zume-robot.jpg>

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

References:

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- [3] CHI'10 *Panel Discussion on User Research*, 2010.
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- [5] Jonas, W. A Scenario for Design, *MIT Press* 2001.
- [6] Norman, D. The Psychology of Everyday Things, *Basic Books* 1988.
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- [8] Rogers, Y., Preece, J. & Sharp, H. Interaction Design, *Wiley & Sons* 2011.