

User Experience Design I **(Interaction Design)**

Interaction Beyond the Desktop

Lecture Overview:

III UX Beyond the Desktop

A horizontal bar at the bottom of the slide is divided into three segments: a grey segment on the left, a green segment in the middle, and an orange segment on the right. A vertical black line with a red triangle at the bottom points from the orange segment to a grey callout box above it. The callout box contains the text 'III UX Beyond the Desktop'. Below the bar, the labels 'First Part', 'Second Part', and 'Third Part' are centered under their respective segments.

First Part

Second Part

Third Part

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)

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

source: [8]

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

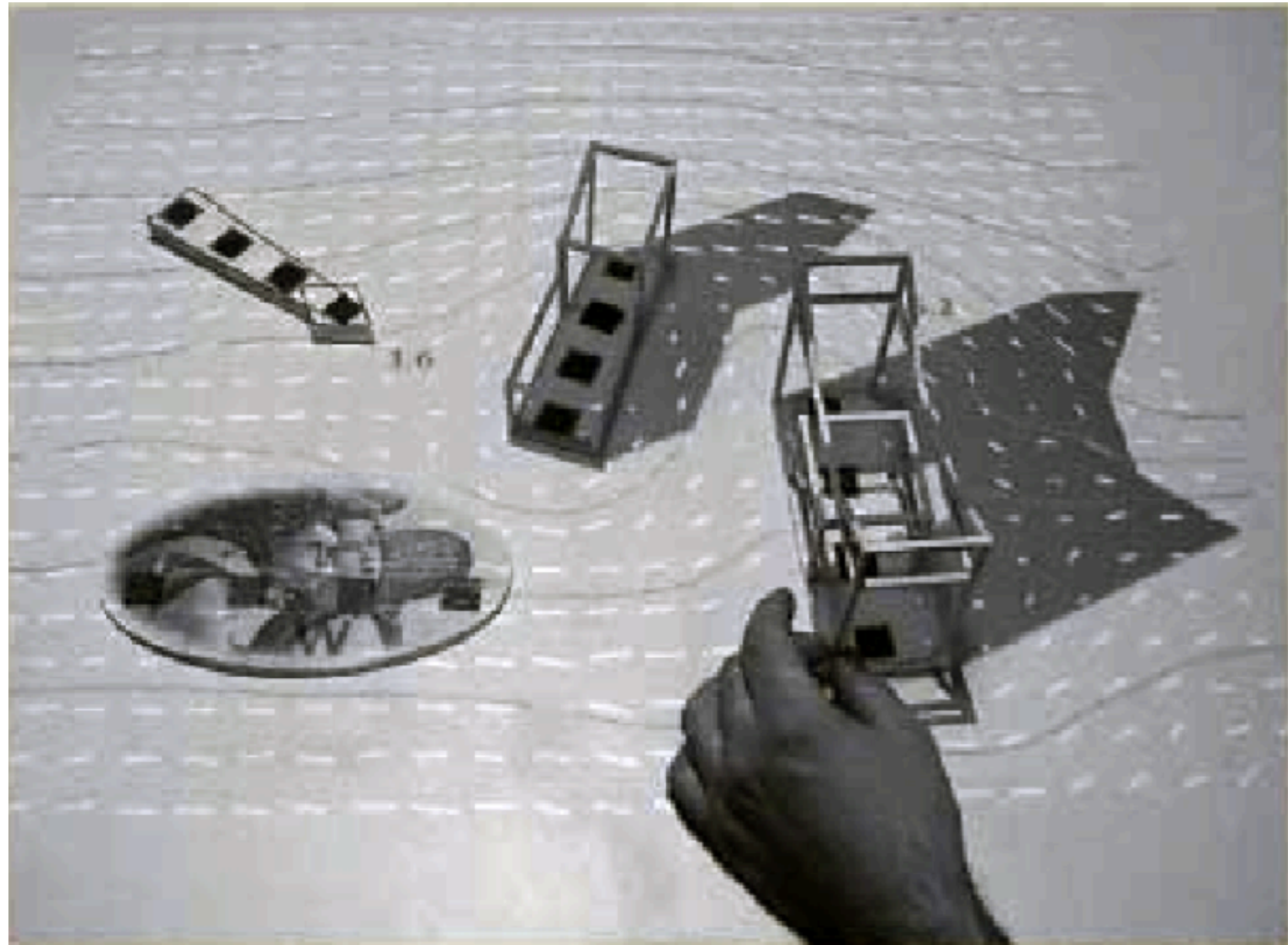
source: [8]

(2) Tangible interfaces (TUI)

- Type of sensor-based interaction, where physical objects, e.g., bricks, are coupled with digital representations
- When a person manipulates the physical object/s it causes a digital effect to occur, e.g. an animation
- Digital effects can take place in a number of media and places or can be embedded in the physical object

Urp

- physical models of buildings moved around on tabletop
- used in combination with tokens for wind and shadows -> digital shadows surrounding them to change over time



source: [8]

Benefits

- Can be held in both hands and combined and manipulated in ways not possible using other interfaces
 - allows for more than one person to explore the interface together
 - **objects can be placed on top of each other, beside each other, and inside each other**
 - encourages different ways of representing and exploring a problem space
- People are able to see and understand situations differently
 - can lead to greater insight, learning, and problem-solving than with other kinds of interfaces
 - **can facilitate creativity and reflection**

source: [8]

Research and design issues

- Develop new conceptual frameworks that identify novel and specific features
- **The kind of coupling to use between the physical action and digital effect**
 - If it is to support learning then an explicit mapping between action and effect is critical
 - If it is for entertainment then can be better to design it to be more implicit and unexpected
- What kind of physical artefact to use
 - Bricks, cubes, and other component sets are most commonly used because of flexibility and simplicity
 - Stickies and cardboard tokens can also be used for placing material onto a surface

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





"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

source: [8]

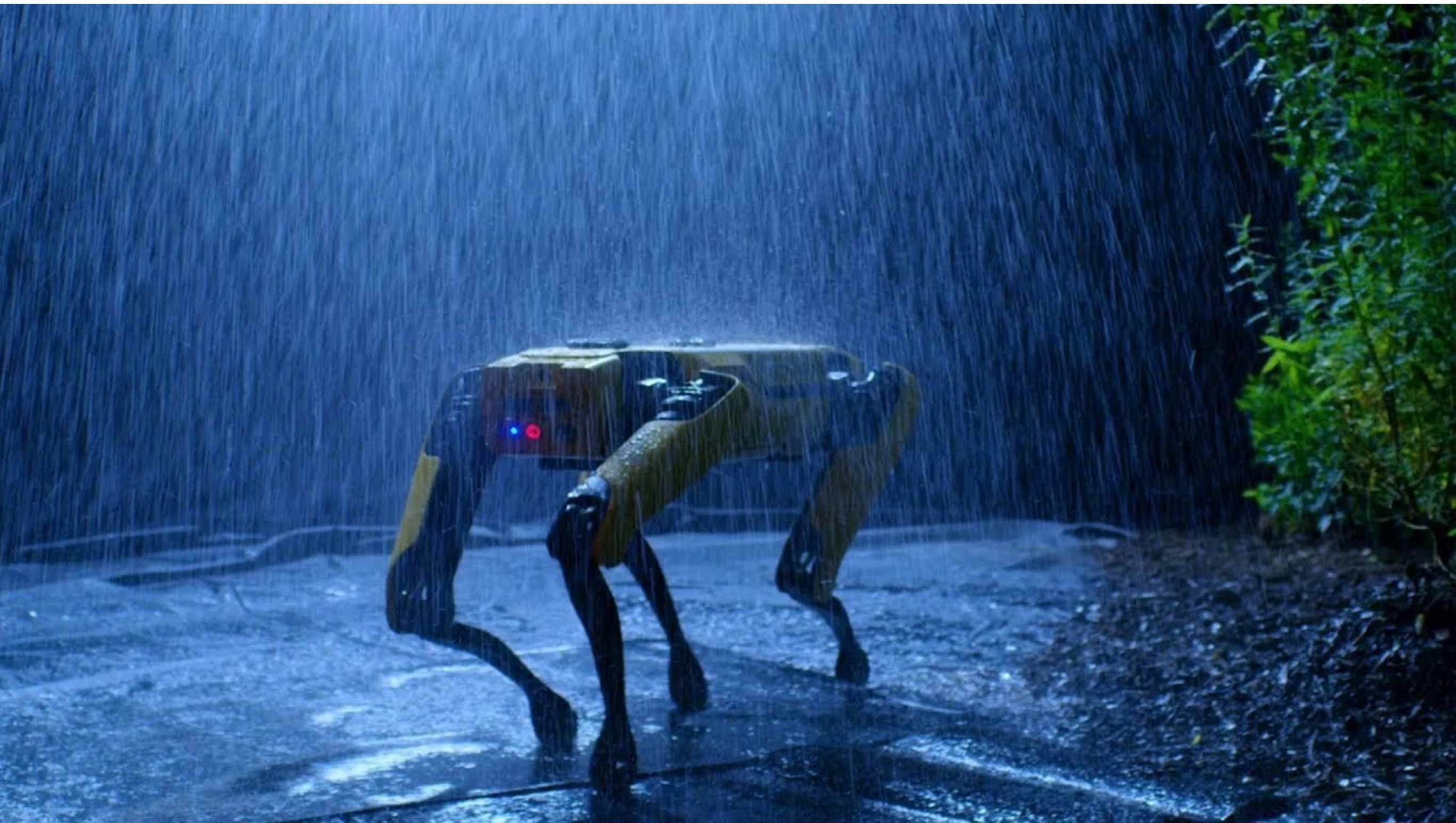
Skintrack 2016



(3) Robotic interfaces

Four types

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



<https://www.youtube.com/watch?v=wlkCQXHEgjA>



https://www.youtube.com/watch?v=dagjQW_jgtE



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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)?

source: [8]

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:

- [1] Buxton, W. *Sketching User Experiences, Morgan Kaufmann 2007.*
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