

Virtual Reality Haptic Interactions

(虛擬實境與觸覺回饋互動)

Lecturer: Ray
Week 1 (9/11)

Syllabus

Team up	1	Introduction	Check point
	2	Brain storming & paper reading instruction	
	3	Introducing Arduino	
	4	Arduino, coding	
	5	Motors	
	6	Motor and encoder	
	7	Paper discussion	
	8	Proposal (with lo-fi prototype)	
Proposal check point	9	Unity	Check point
	10	Unity	
	11	Unity, communication and XR	
	12	AI and LLM	
	13	Project discussion	
	14	3D printing	
	15	Project discussion and checkpoint	
	16	Final project	

Grading Policy

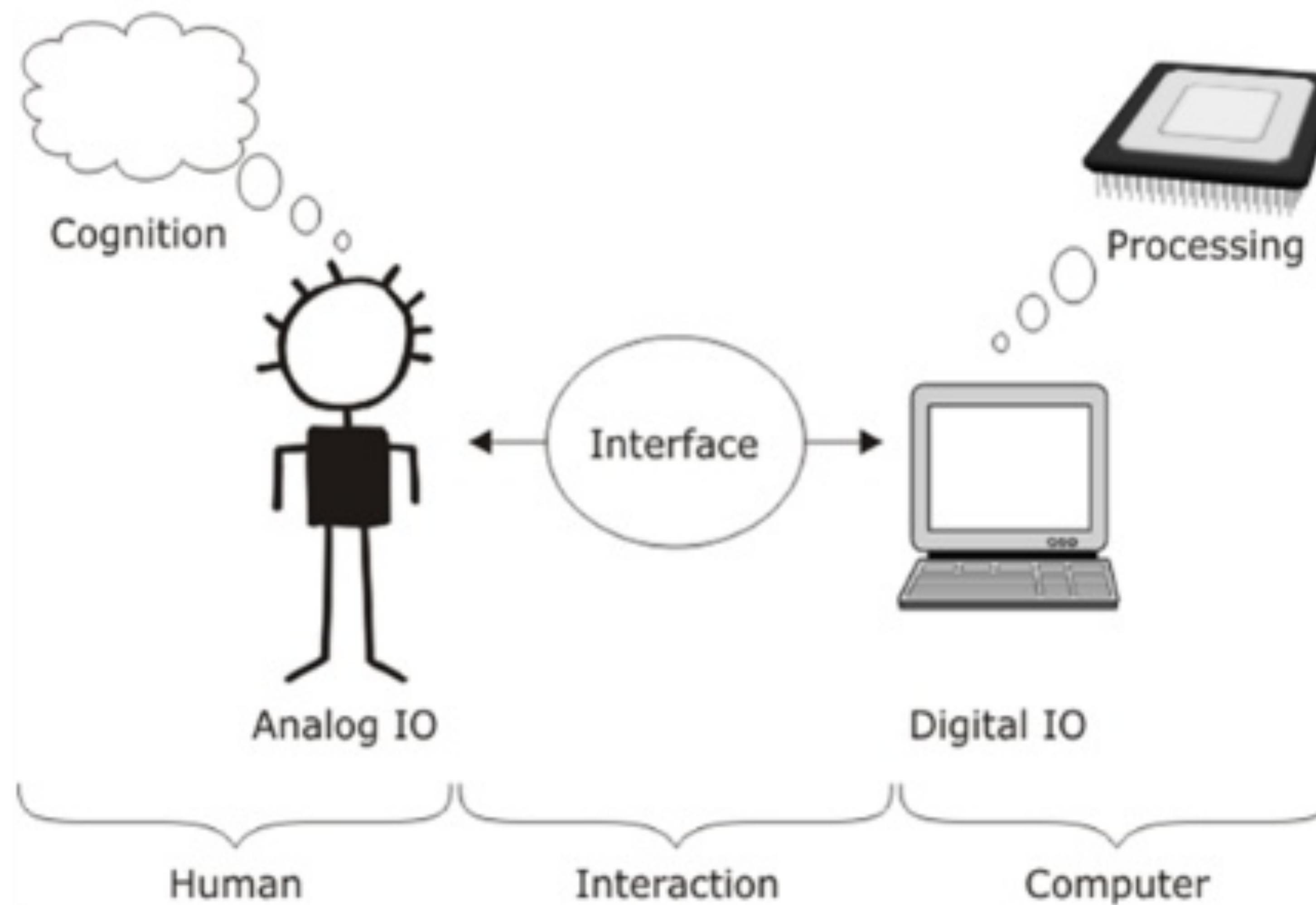
- Proposal (25%)
- Final presentation and demo (40%)
- Final report (20%)
- Participation (15%)

Requirements

- Novelty
- Technique
 - XR
 - Arduino for haptic devices
- Don't quit or disappear in the middle of the course and abandon your team members.

No freeloaders and
giant babies

Human-Computer Interaction (HCI)



Human-Computer Interaction (HCI)



[Minority Report]

Human-Computer Interaction (HCI)



[Iron Man]

UI v.s. UX

Brand
Centric



Customer
Centric

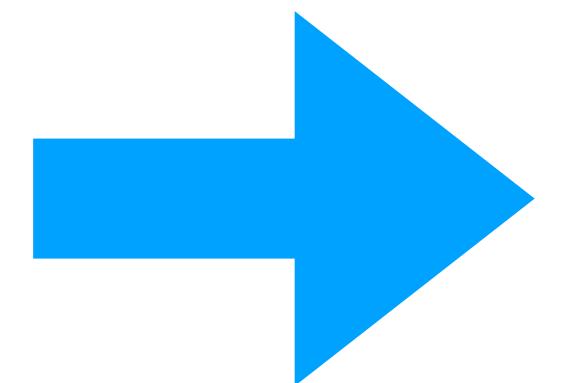


[Twitter]

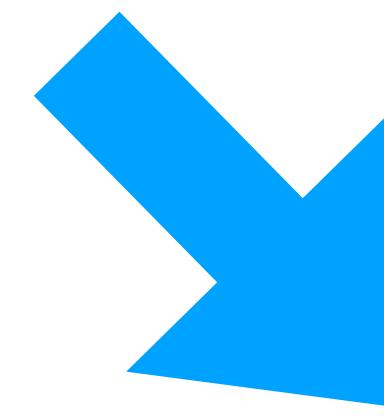
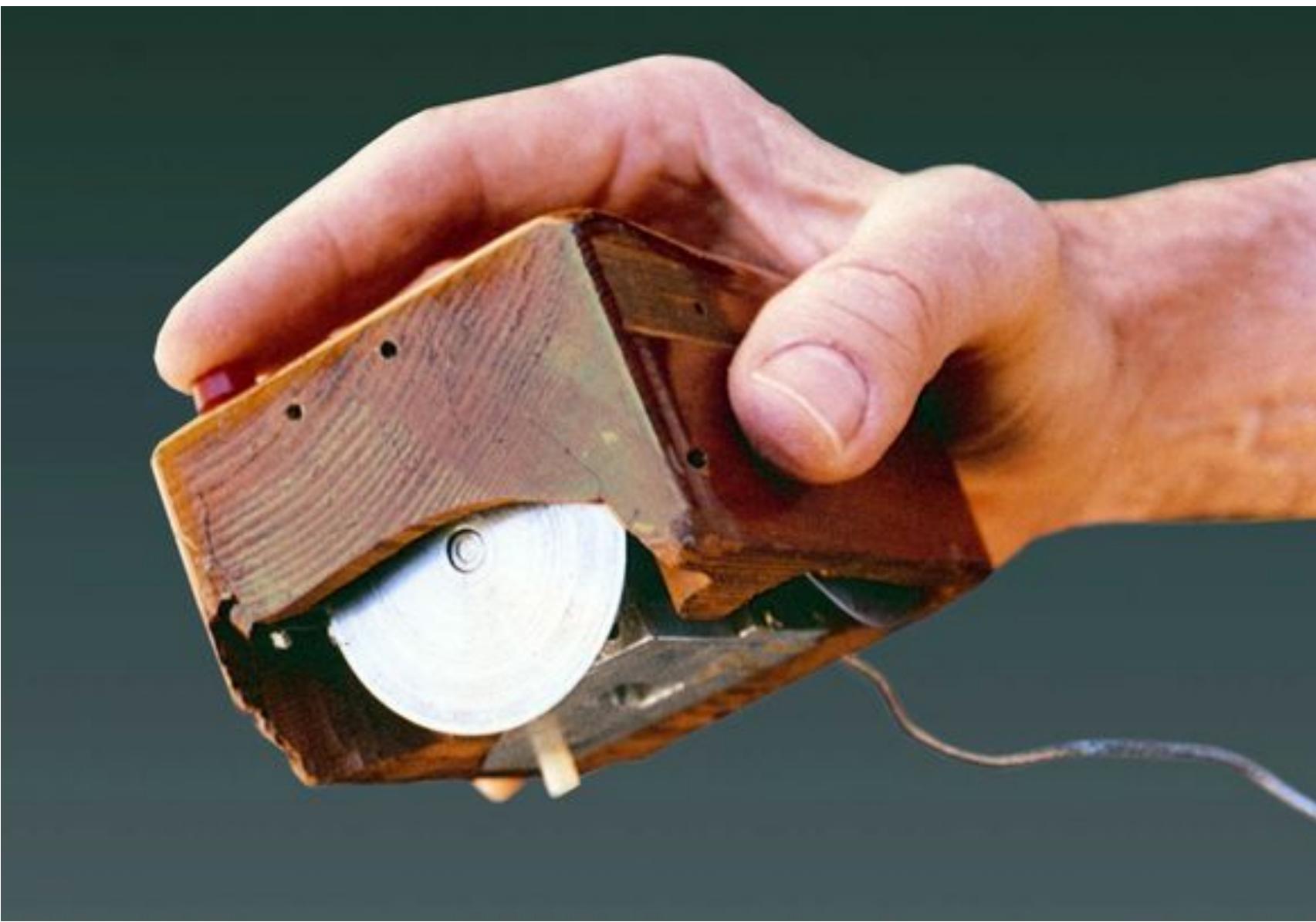
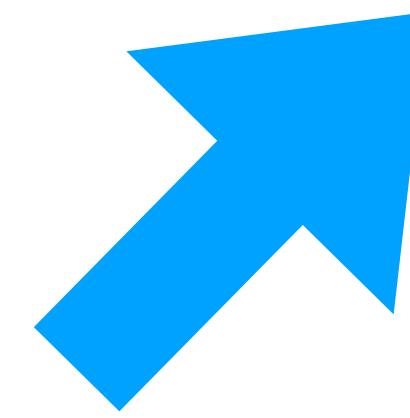
CLI v.s. GUI



Command Line Interface (CLI)



Graphic User Interface (GUI)
[Macintosh Mouse, 1984]



[Engelbart Mouse, **1964**]



Command Line Interface (CLI)



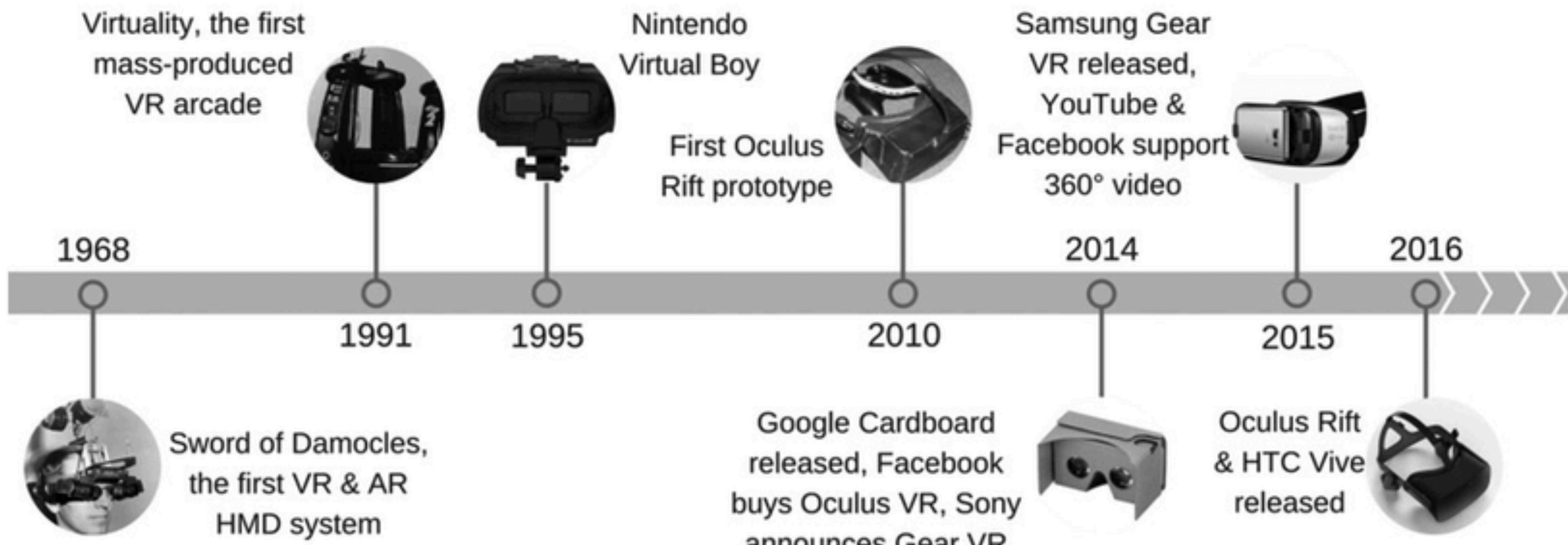
Graphic User Interface (GUI)
[Macintosh Mouse, **1984**]

Impact in VR



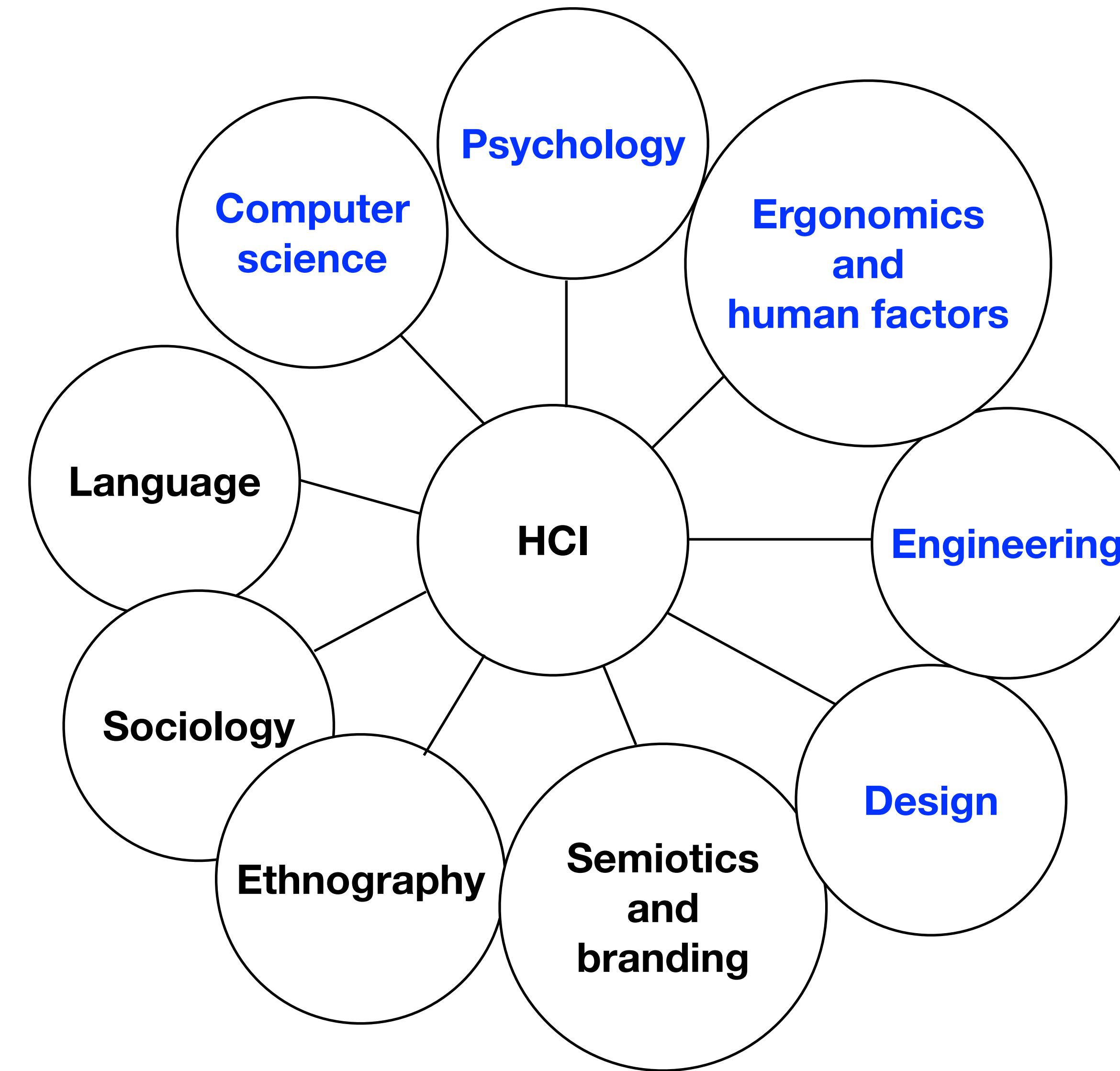
[Ready Player One, <https://youtu.be/VUDCnNvzkgE>]

VR History

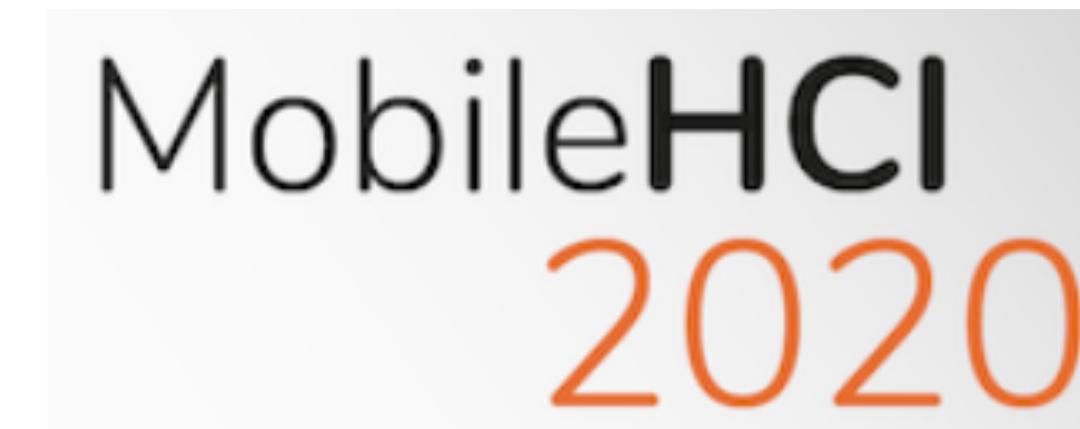


How Digital and Virtual Life Trapped in Visuality and New Media
Systems Affect Teaching and the Learning Process, 2016

Human-Computer Interaction (HCI)



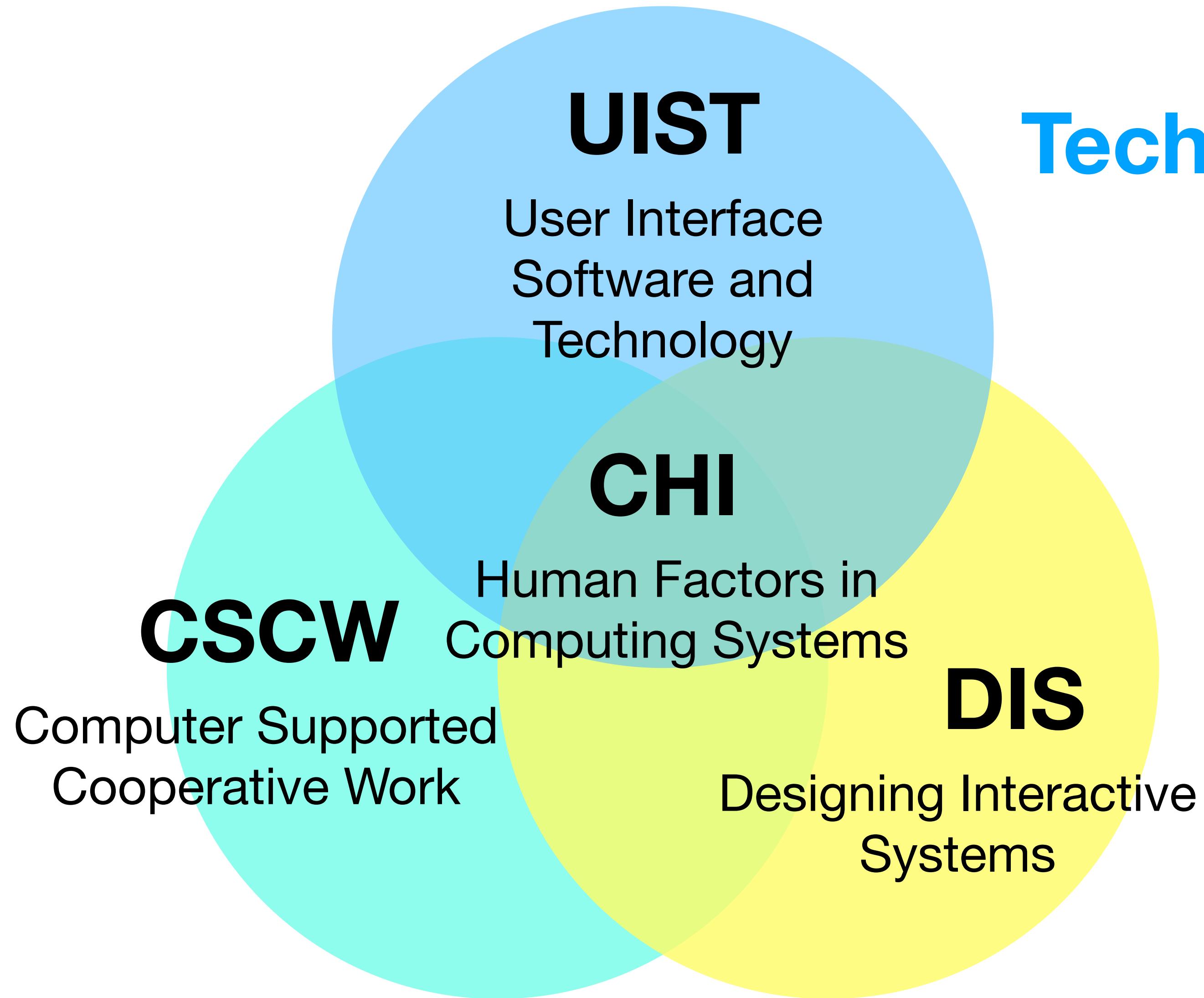
HCI Conferences



HCI Conferences

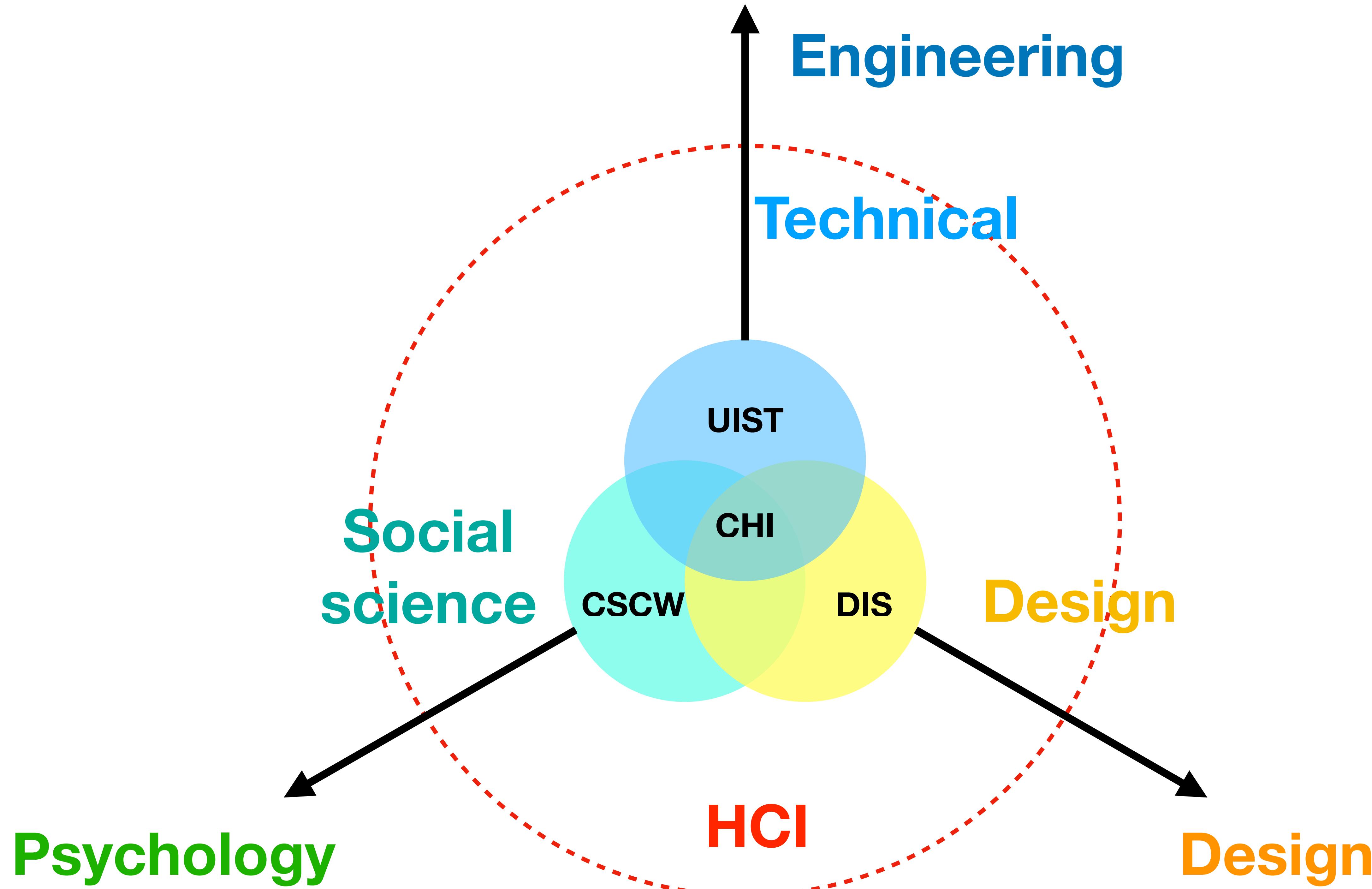


**Social
science**

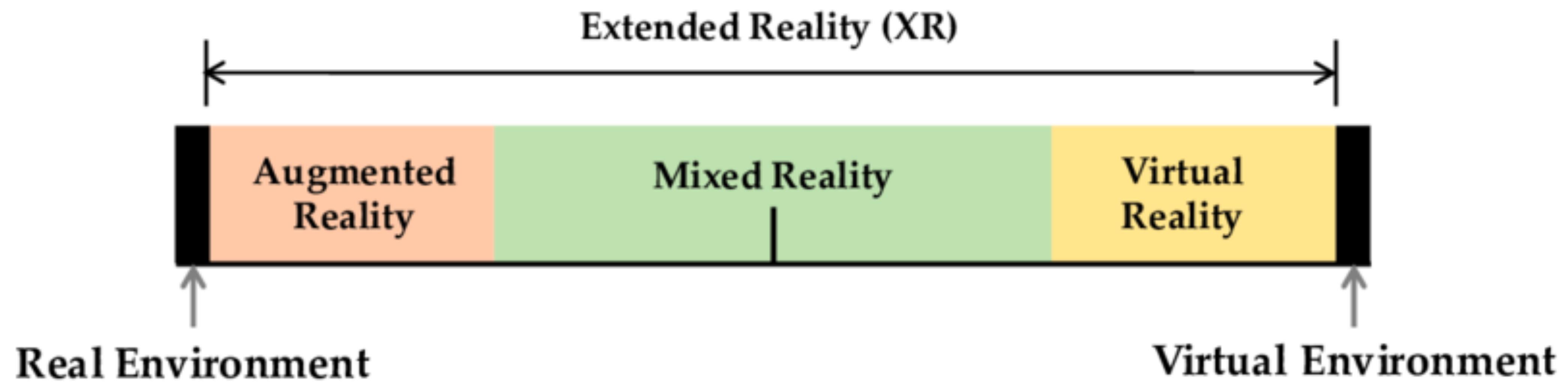


Technical

Design



VR/AR/MR/XR



VR/AR/MR/XR



Extended Reality (XR)

Umbrella term for any technology that alters reality by adding digital elements to the *real-world* environment to any extent

Augmented Reality (AR)

View of the *physical* or *real-world* with an overlay of digital elements

Mixed Reality (MR)

Blend of the *physical* or *real-world* with digital or virtual elements where physical and digital elements can interact

Virtual Reality (VR)

View of a fully-immersive digital environment

Low Immersion

Physical or *real-world* environment

High Immersion

Virtual environment

Please join the course Slack:
<https://bit.ly/3XdX6Kw>

Online Resource

- CHI 2024 video preview: <https://bit.ly/3z4ciSJ>
- CHI 2023 video preview: <http://bit.ly/3rZQ3t9>
- UIST 2023 video preview: bit.ly/48nl21U
- UIST 2022 video preview: <https://bit.ly/3YLhLF3>

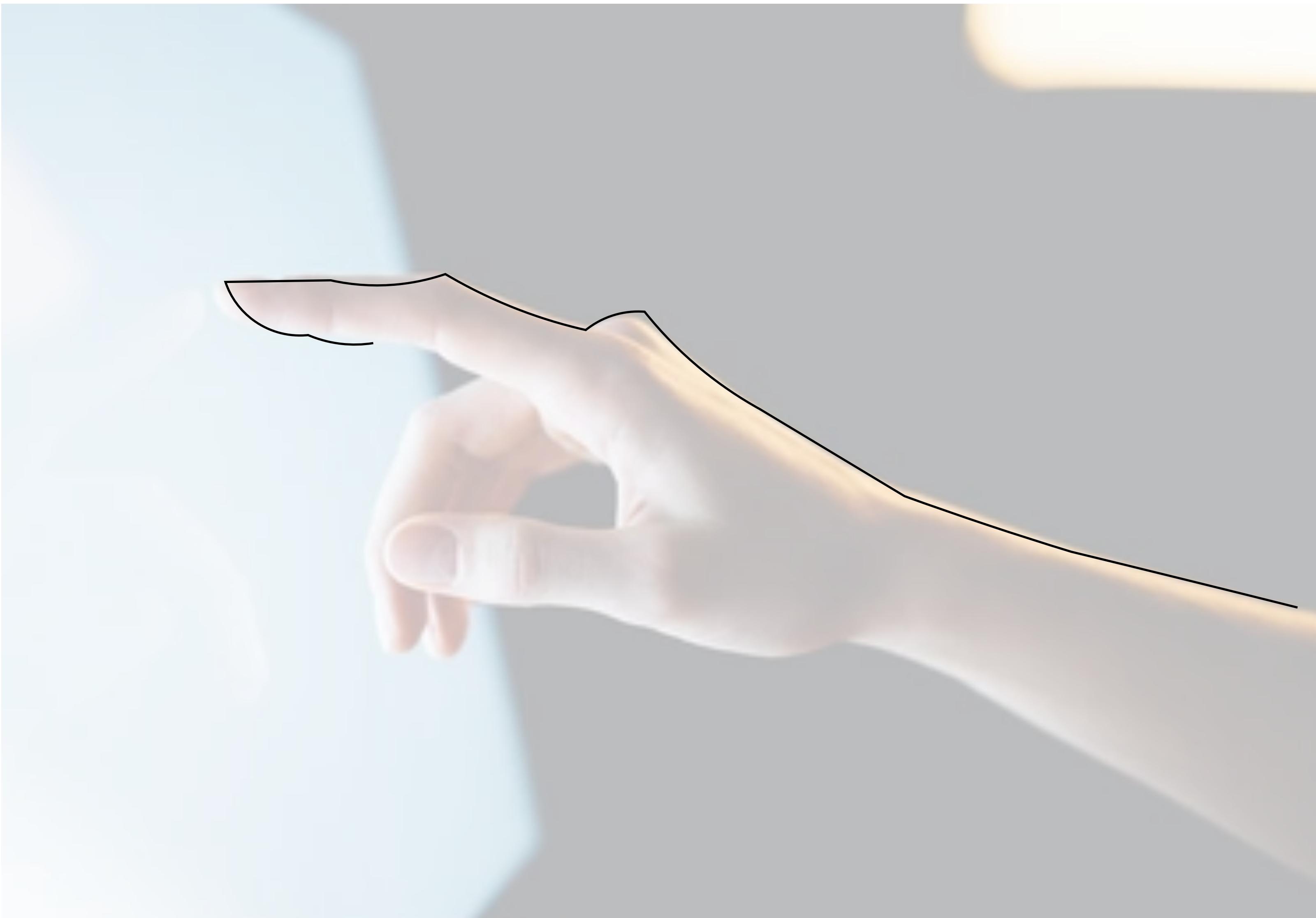
References

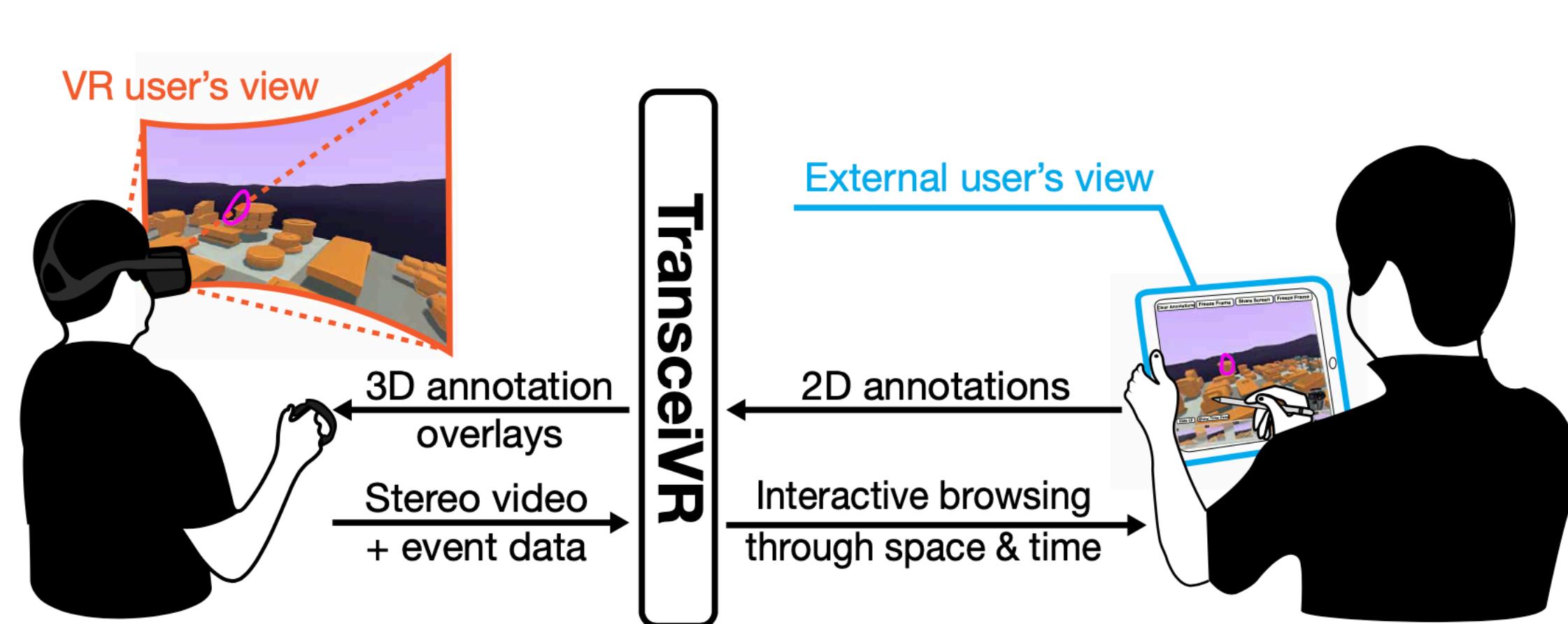
- TACHI 2021 demo video: <https://youtu.be/7MmFNrJn40I>
- VR Battle (CGW 2021): <https://reurl.cc/4aqXmK>
- NTHU ISA VR course demo: <https://reurl.cc/3aOE2L>

Self-Introduction (ID card)

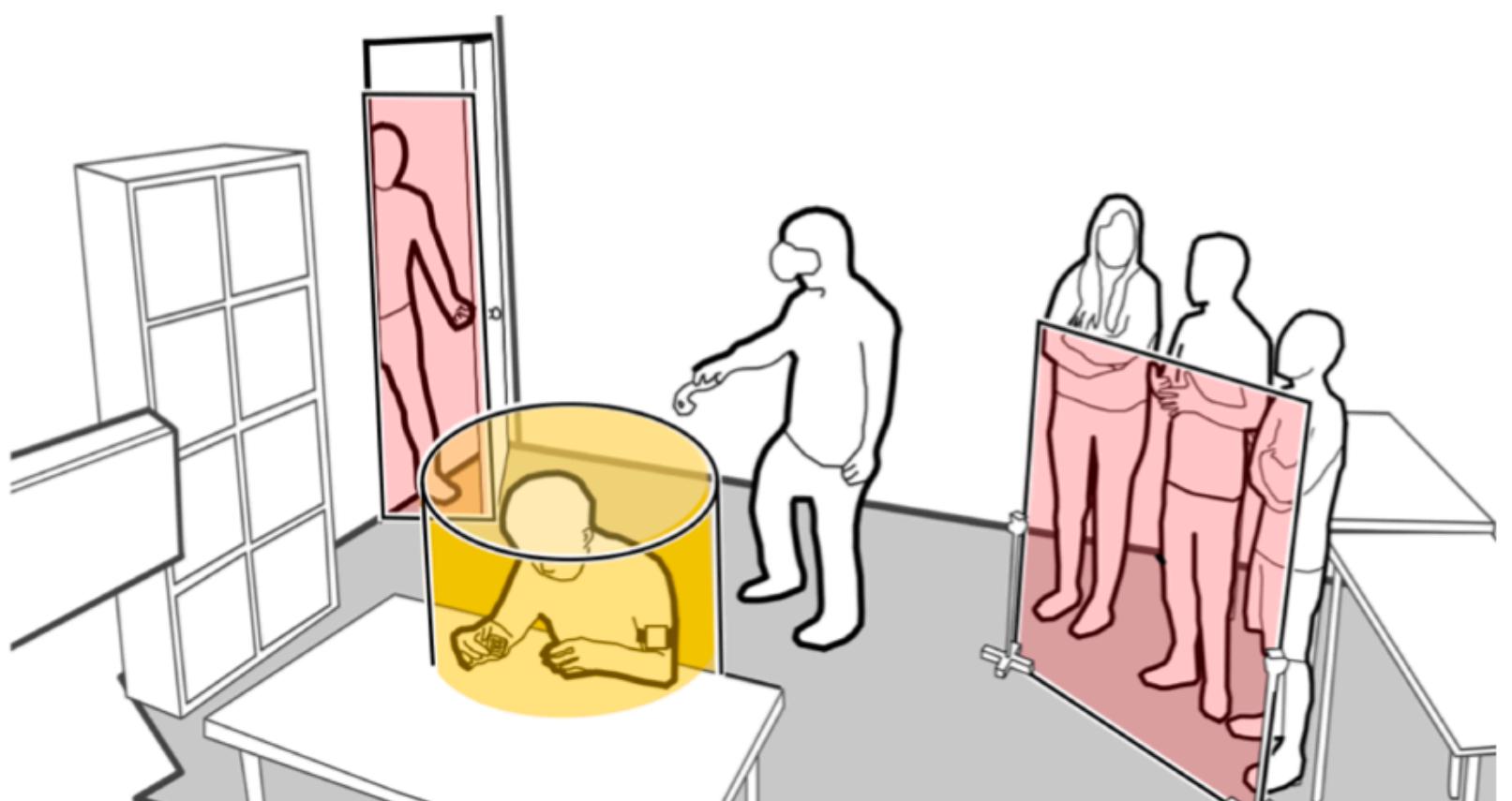
- Background, hobby, ability, projects... (2 slides)
- Sketch a picture to imagine of future XR haptic interactions (based on UIST or CHI video previews)
- 2 min. self-introduction (1 min. QA)

Sketching (for teaser)

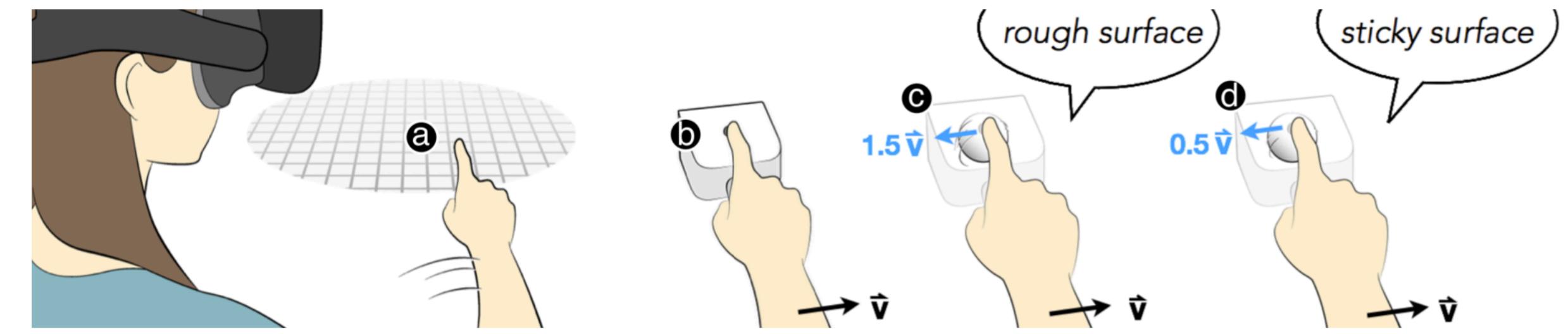




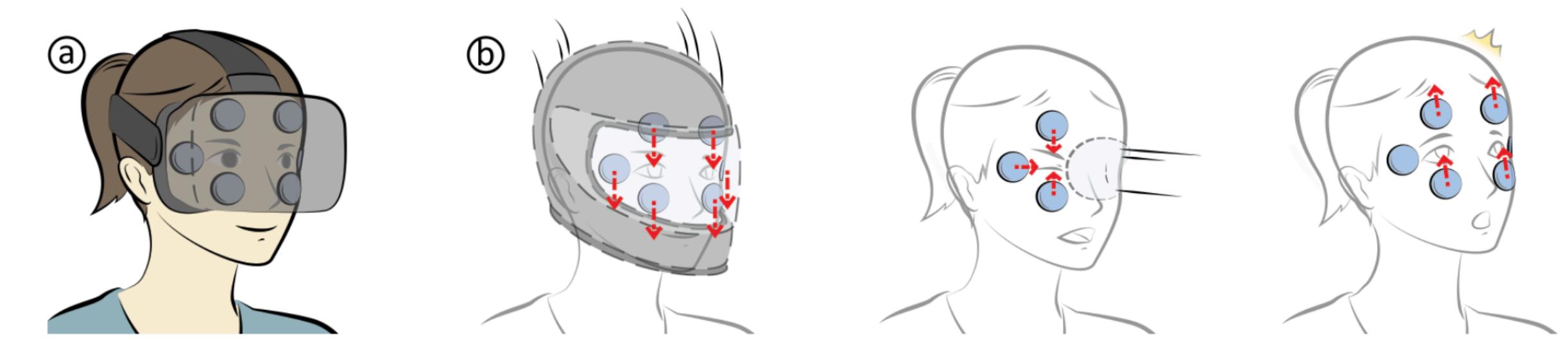
[TransceiVR, UIST'20]



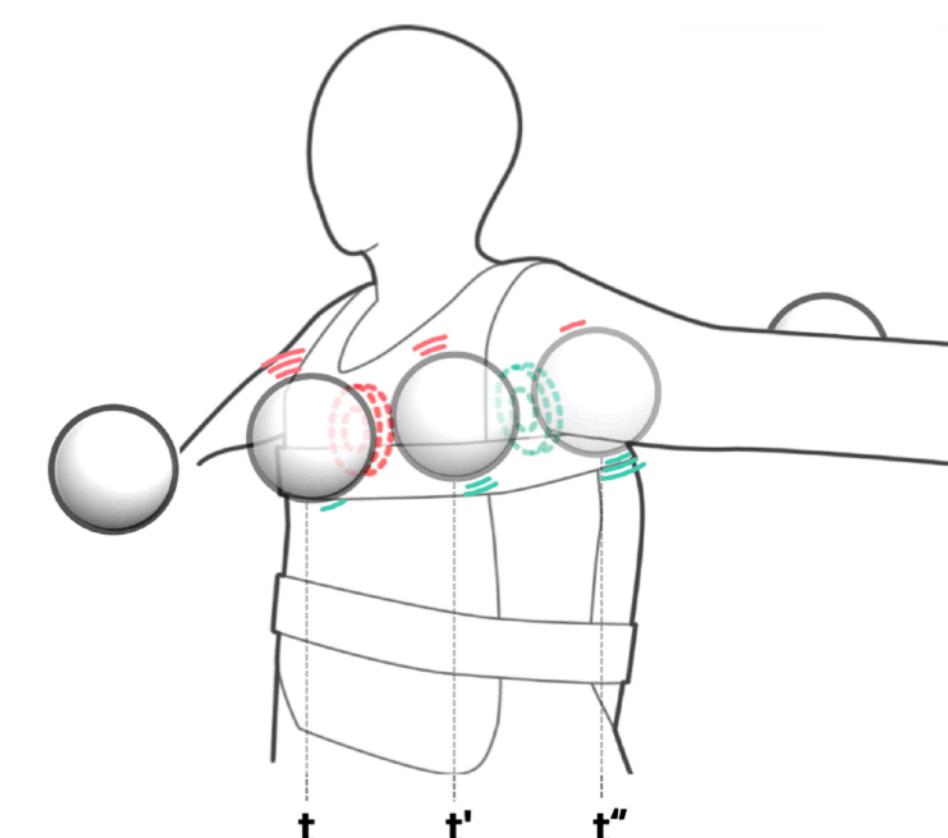
[ShareSpace, UIST'18]



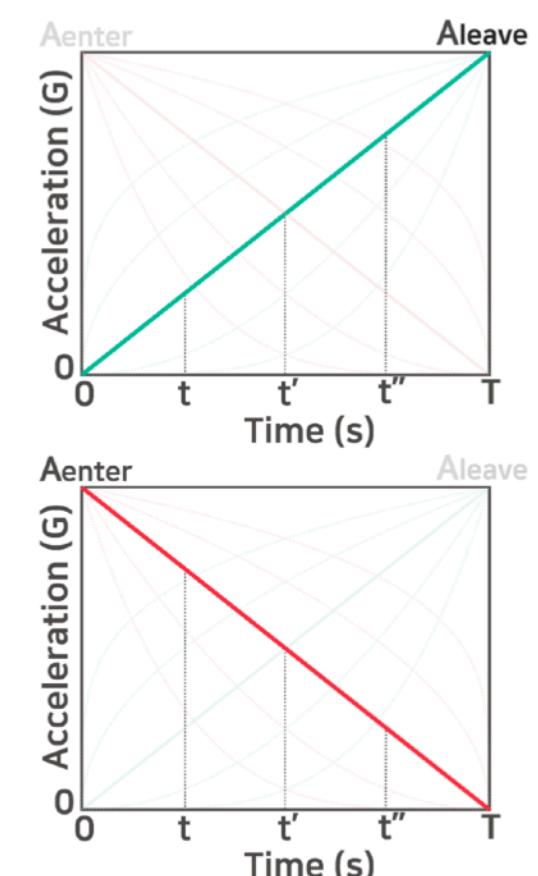
[RollingStone, UIST'18]



[Masque, UIST'19]



[Body-Penetrating Tactile Phantom Sensations, CHI'20]



About UIST



TAICHI X UIST panel
<https://youtu.be/ug98ih0LiC0>

About me



Ray
<https://hsnuhrt.github.io/>