Case Studies in Design Informatics 1 - INFR11094
Week 4 – 6th October 2025

Cultural Heritage and XR

Dr. Susan Lechelt
Lecturer in Design Informatics
susan.Lechelt@ed.ac.uk

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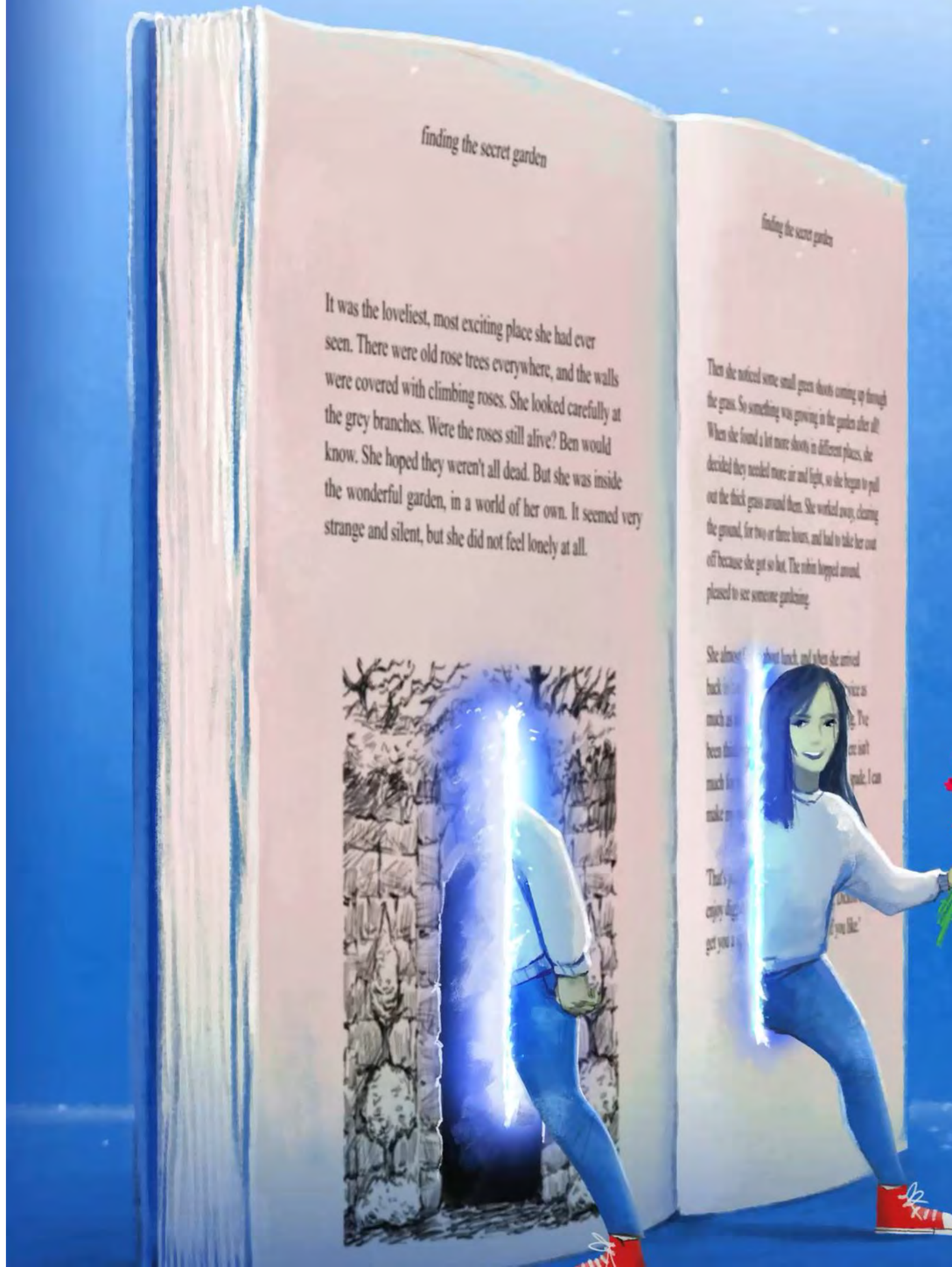

In Today's Lecture…

- Questions about CW1.1
- Define XR and Cultural Heritage
- Think through potential applications
- Dig deeper into opportunities, consideration ad implications for Augmented Reality & Tangible Culture

In 300 words (+/- 10%), please write a short review of how the approaches used in the two papers compare and differ from one another, with citation to key references. Consider focusing on:

- What types of "things" being designed;
- How people (users, stakeholders) are involved;
- What types of problems are being solved, or types of things being enhanced;
- The design process that is described.

Remember, you need to find and review two papers that meet the constraints:

- They are published on the ACM Digital Library;
- They are relevant to design informatics (design + data).

And also:

- Your review should be focused on approach, process, methods – not comparing the technologies designed / developed / evaluated in a paper.

In addition to your 300 word review, please acknowledge any use you have made of Generative AI:

- The University provides guidance on acceptable and unacceptable uses of GenAI here. While you may use GenAI to help with ideation, or grammar checking for example, the below uses of AI for this coursework are **not acceptable**:

1. Presenting AI outputs as your own, original work.
2. Use of an AI translator to convert assessments to English before submission: English is the language of teaching and assessment at Edinburgh – machine translation is treated as false authorship and is not acceptable.
3. Submitting an assessment which includes elements of AI-generated text without acknowledgment.
4. Submitting an assessment which includes AI-generated images, audio or video without acknowledgment.
5. Submitting an assessment which includes AI-generated mathematical formulae or reasoning, or computer code, without acknowledgment.
6. Citing AI-found sources without reading and verifying them.

A template for you to download and submit with is available below.

Student question! What is the difference between AR and VR?

Adapted from: Milgram, P., & Kishino, F. (1994). A taxonomy of mixed reality visual displays. *IEICE TRANSACTIONS on Information and Systems.*

What is Extended Reality? (XR)

Physical / Real Environment

Virtual Environment

Adapted from: Milgram, P., & Kishino, F. (1994). A taxonomy of mixed reality visual displays. *IEICE TRANSACTIONS on Information and Systems.*

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What is Extended Reality? (XR)

Augmented Reality (AR):
Overlaying digital elements on the physical environment; less interaction between physical and digital

Mixed Reality (MR):
Blend of physical/real elements and digital elements; More interaction between the physical and digital

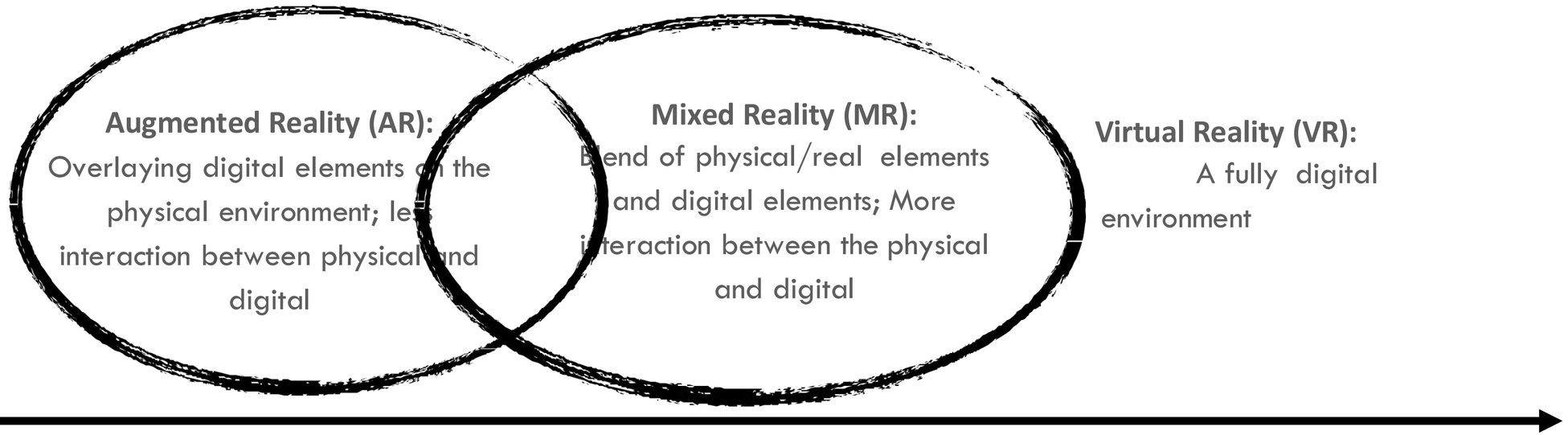
Virtual Reality (VR):
A fully digital environment

Physical / Real Environment

Virtual Environment

Adapted from: Milgram, P., & Kishino, F. (1994). A taxonomy of mixed reality visual displays. *IEICE TRANSACTIONS on Information and Systems.*

What is Extended Reality? (XR)



Adapted from: Milgram, P., & Kishino, F. (1994). A taxonomy of mixed reality visual displays. *IEICE TRANSACTIONS on Information and Systems.*

What is Extended Reality? (XR)

Van Gogh Immersive Experience

Pokemon Go

Magic Leap

Meta Quest

Physical / Real Environment

Virtual Environment

Adapted from: Milgram, P., & Kishino, F. (1994). A taxonomy of mixed reality visual displays. *IEICE TRANSACTIONS on Information and Systems.*

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What Technologies are Used in XR?

- Mobile phones
- Cardboard VR
- Head mounted displays (Magic Leap 2, Meta Quest, etc.)
- Free-standing devices
- Projection mapping

Poghosyan, Shushan. (2019). Section 9. Pedagogy LEARNING-ORIENTED AUGMENTED REALITY TECHNOLOGY.

ZERO10 Mirror

Google Cardboard

Resources for trying out XR in your own practice

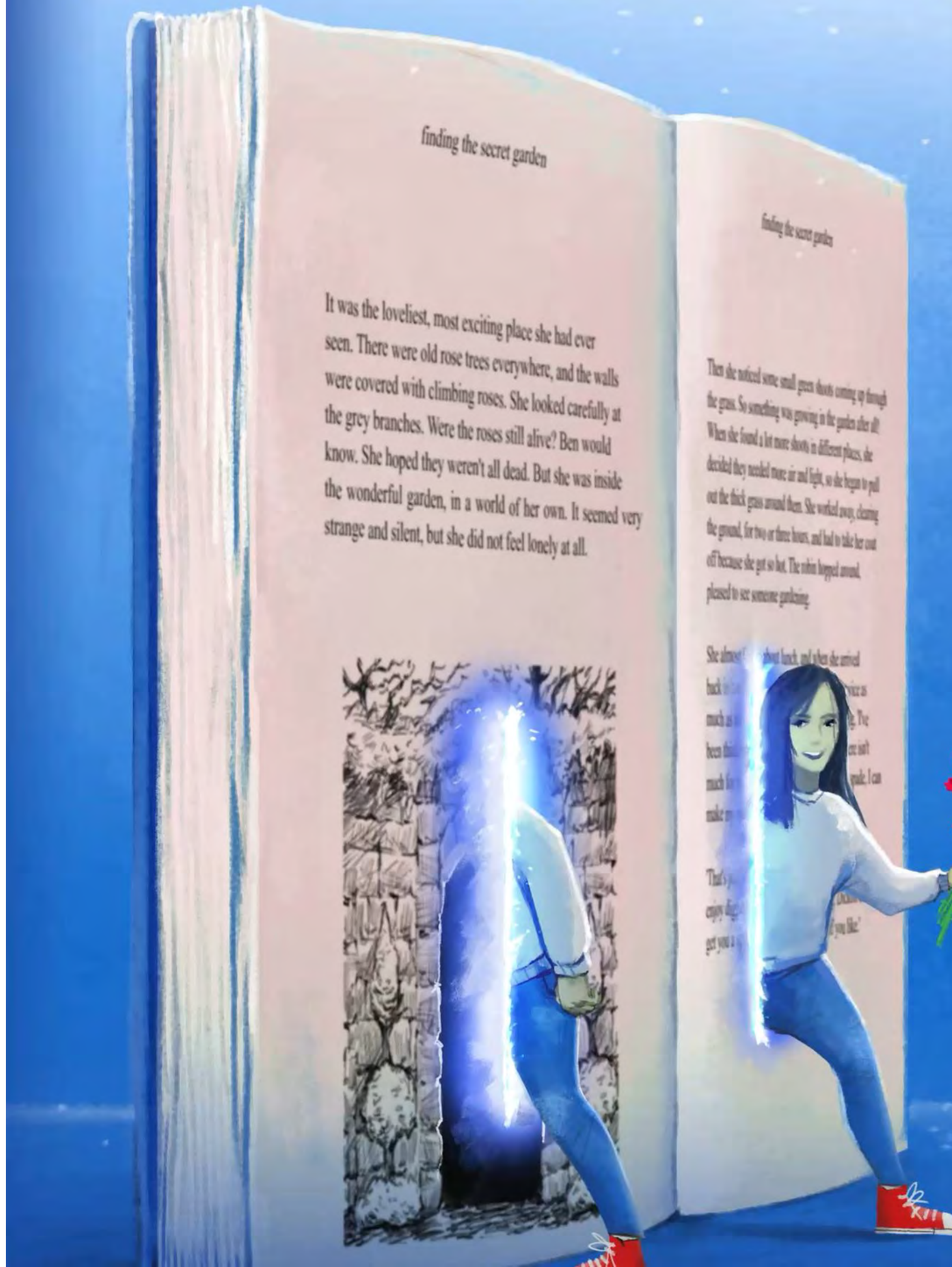
https://mitsquare.medium.com/free-and-open-source-augmented-reality-ar-and-virtual-reality-vr-tools-d59d19d32a64

- Unity – Cross platform game engine
- Blender – 3D computer graphics software
- Adobe Aero – No-code / low-code AR

- ***LinkedIn Learning***
- ***Equipment and support: UCreate or Design Informatics studio***

Immersion and Presence

- **Immersive technology:** Sometimes used interchangeably with XR
- **Immersion:** Can the system trick you into thinking what you are experiencing is real? E.g., is the sensory feedback quick enough? Is the visual resolution sufficient to make you feel like you are there?
- **Presence:** Does the world you are experiencing feel real? Are objects where you would expect them to be? Is the experience engaging?



When is AR better than VR, or vice versa?

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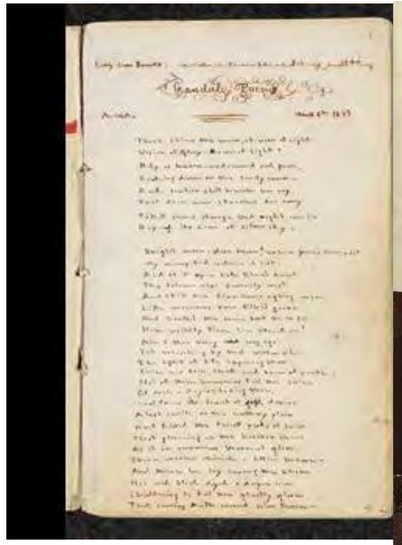
What is Cultural Heritage?

- Cultural assets inherited over generations that contribute to our cultural identity
- Tangible Culture
- Intangible Culture
- Natural Heritage

What is Cultural Heritage?

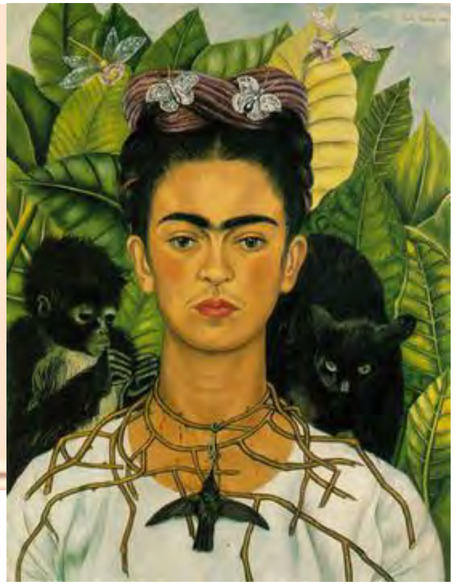
Tangible Culture: Buildings, monuments, art, books, museum collections, etc.



Emily Brontë's notebook, British Library

Edinburgh Castle

Duke of Wellington Statue, PA Media



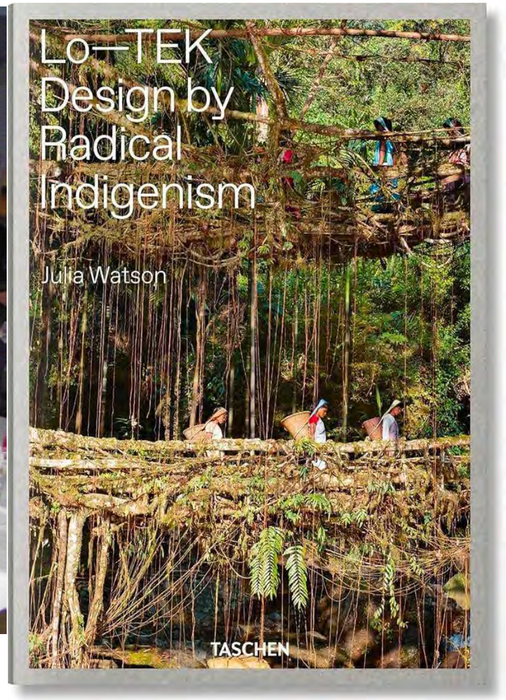
Self-Portrait with Thorn Necklace and Hummingbird, Frida Kahlo

What is Cultural Heritage?

Intangible Culture: Language, knowledge, oral history, folklore, storytelling, performing arts, rituals

Selkies: Mythological creatures that can shapeshift between seal and human forms
Image: 2007 Faroese stamp depicting a *selkie*

Ceilidh Dance
Image: Dave Conner

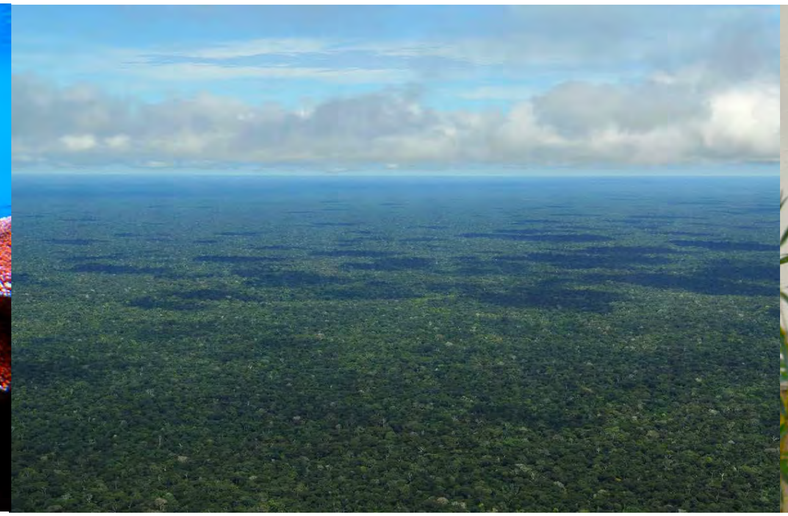


Indigenous knowledge of Khasi people in Northern India
Image: Watson, J. (2019). *Lo-TEK: Design by Radical Indigenise.* Taschen.

What is Cultural Heritage?

Natural Heritage: private and publically protected natural areas, zoos, aquaria and botanical gardens, natural habitat, marine ecosystems, sanctuaries, reservoirs etc.

Great Barrier Reef
https://en.wikipedia.org/wiki/Great_Barrier_Reef#/media/File:Coral_Outcrop_Flynn_Reef.jpg



Amazon Rainforest
https://www.flickr.com/people/38476503@N08

Edinburgh Zoo
https://en.wikipedia.org/wiki/Edinburgh_Zoo#/media/File:Tian_Tian.JPG

How might XR and Cultural Heritage be combined?

https://miro.com/app/board/uXjVJ-8azzU=/?share_link_id=447043389278

Be Our Guest: Intercultural Heritage Exchange

Figure 3: The different shapes a detected drinking utensil morphs into (left to right): Iraqi, Indian, and Senegalese cups.

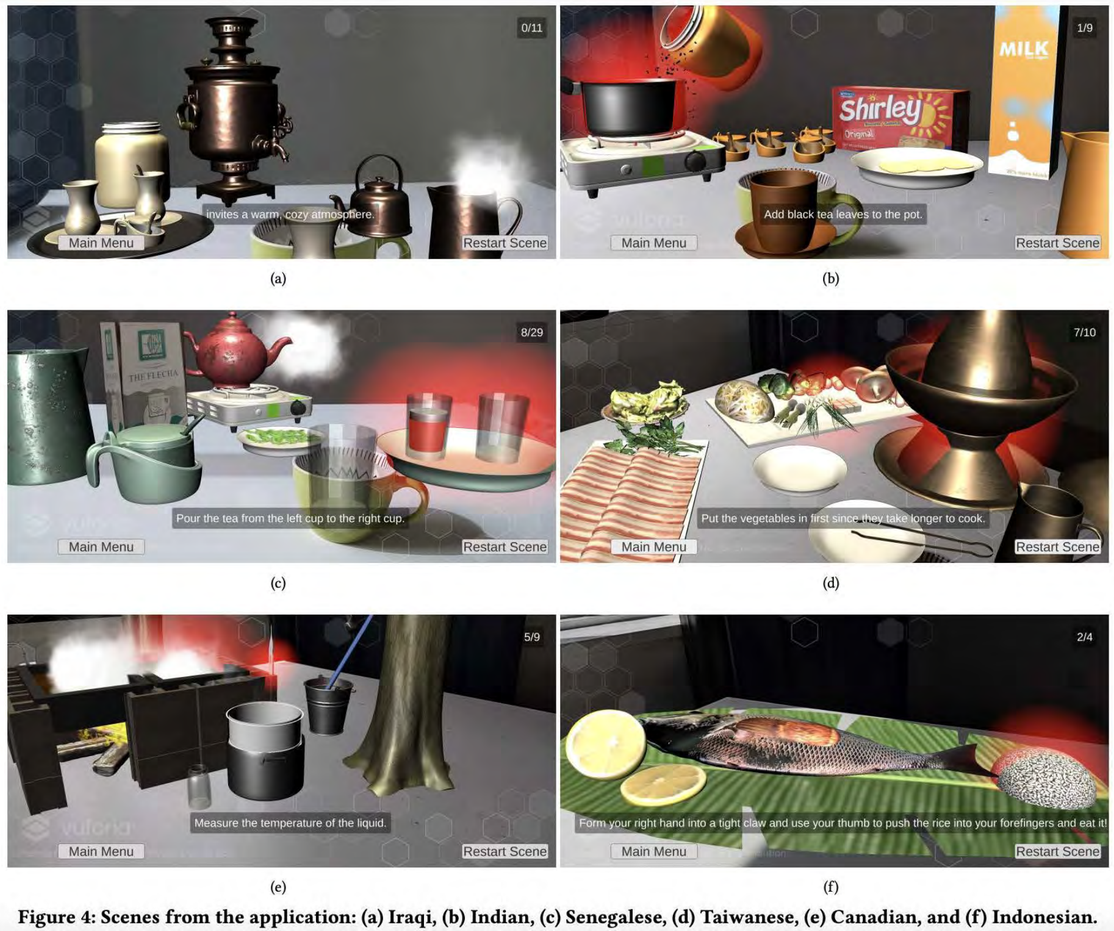


Figure 4: Scenes from the application: (a) Iraqi, (b) Indian, (c) Senegalese, (d) Taiwanese, (e) Canadian, and (f) Indonesian.

- A user is “digitally” invited to the houses of people from different cultures and asked to help with one of their cultural rituals around simple everyday objects
- E.g., making hot pot or making tea
- **Intangible heritage and AR**

Sabie, D., Sheta, H., Ferdous, H. S., Kopalakrishnan, V., & Ahmed, S. I. (2023, April). Be Our Guest: Intercultural Heritage Exchange through Augmented Reality (AR). In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems* (pp. 1-15).

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Student questions!

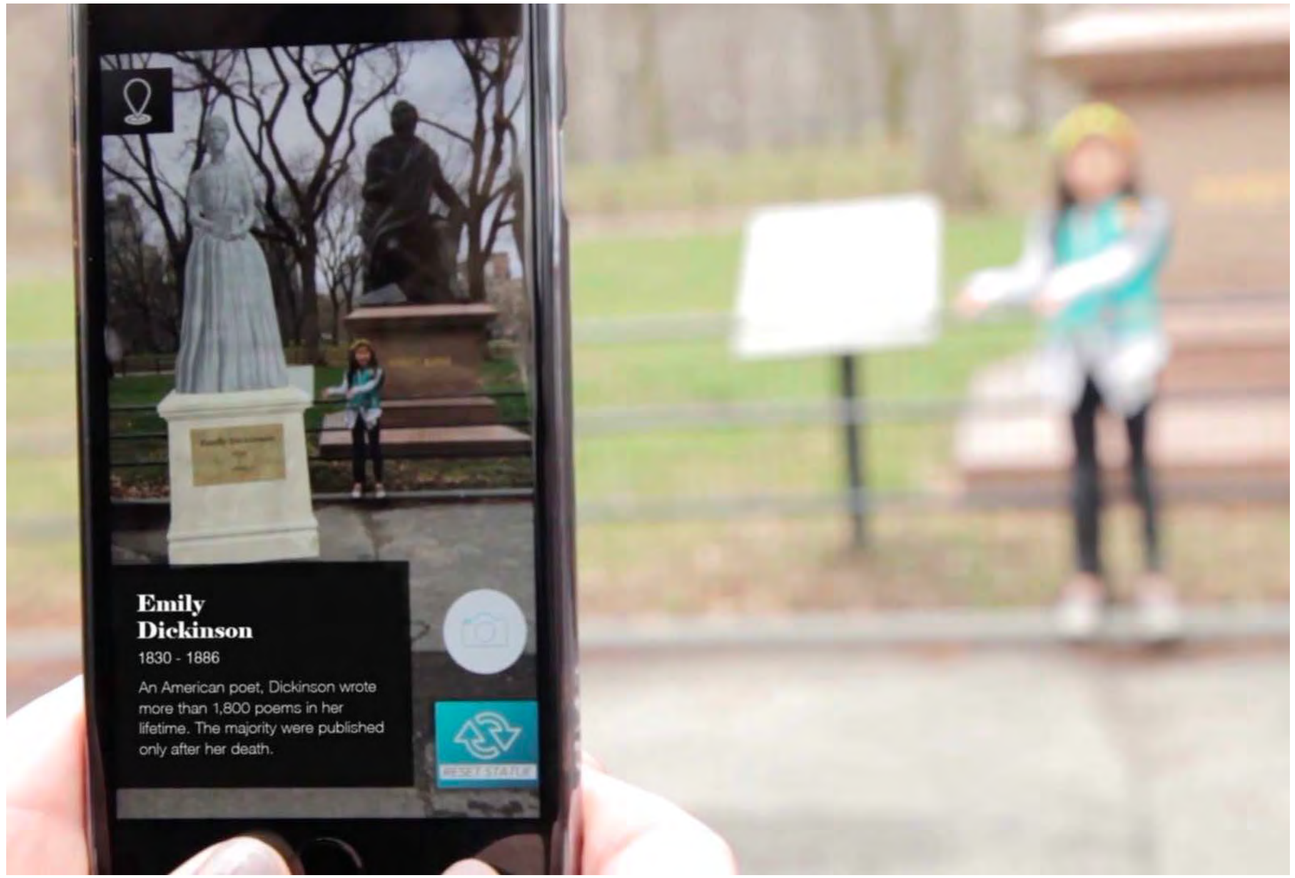
- When cultural stories are turned into AR/VR data, what parts of them might be lost or changed?
  -> Importance of accurately depicting original artefacts and their context, and acknowledging the limitations of technology

- Would it be ethical to capture stories from cultures that utilise oral traditions in this way? It some cases only elders or other appointed members of society tell these stories, and therefore any 'meddling' with the stories could be considered appropriation or problematic.
  -> Importance of considering cultural context and consent

The Whole Story

- Digital overlay of sculptures of women and descriptions of them, next to existing sculptures of men
- *“Derived from the insight that over 93% of the statues in North America are of men. In Central Park, there was Tinker Bell and even a dog…but no women.”*
- **Tangible heritage + AR**

https://www.stephenmartell.com/thewholestory



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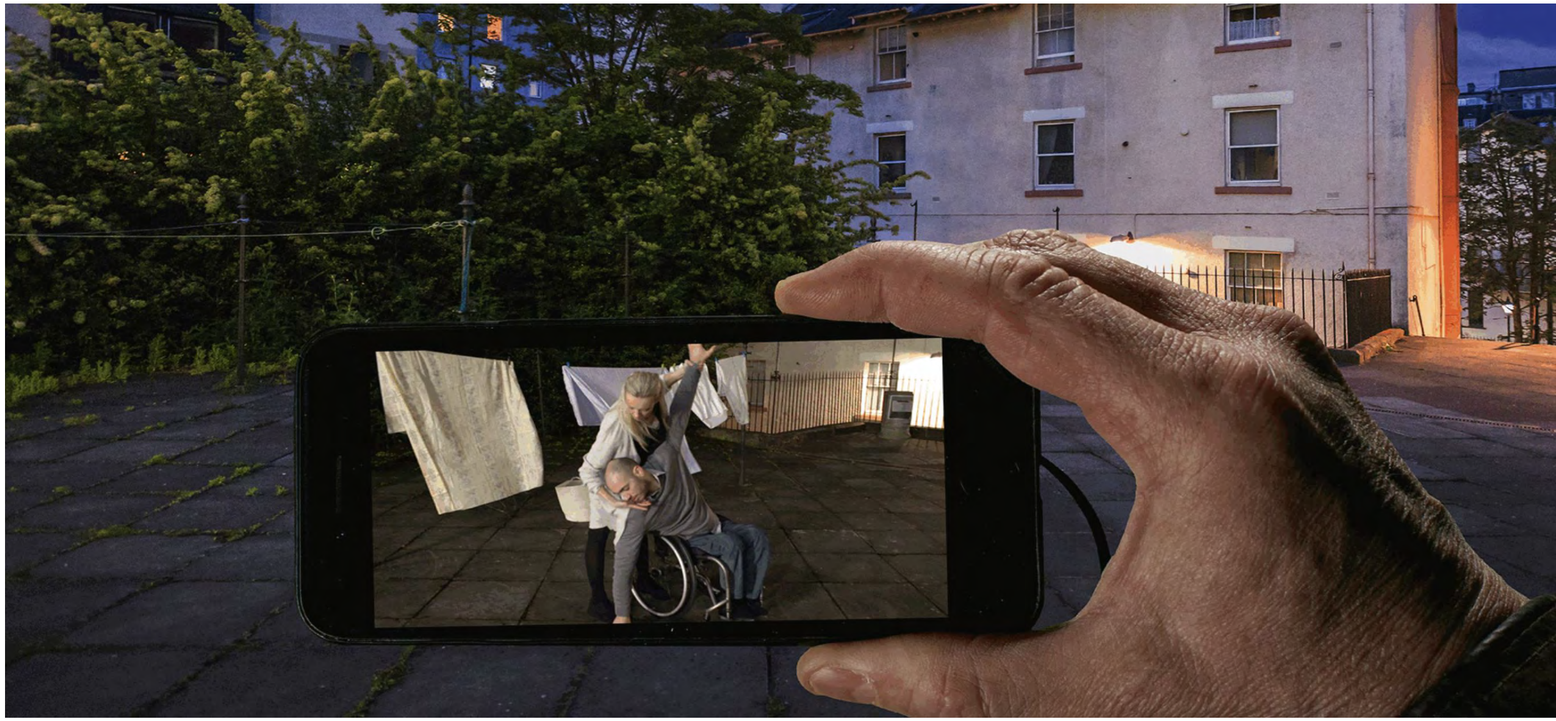
Night Walk for Edinburgh

https://www.youtube.com/watch?v=OC4rER-BFZo

- Outdoor experience free to explore on your own time
- "Night Walk for Edinburgh is a 50 minute walk, best viewed at dusk, which takes you through the closes and backstreets of Edinburgh's Old Town. […] a disjointed tale – part game- playing, part surrealistic poetry, perhaps even a murder mystery – layered with history, invention and memories."
- **(mostly) intangible heritage + AR**



REVIVRE: Saola Studio at National Museum of Natural History, Paris

https://www.saolastudio.com/en-gb/revivre

- Visitors use head-mounted display to interact with extinct species
- Now part of permanent museum exhibit
- More direct interaction between the physical and virtual world
- **Natural heritage + MR**

Alice in Wonderland in VR at the V&A Museum

https://www.youtube.com/watch?v=j1maAW2F2Ug&t=51s

- Created as part of an Alice in Wonderland exhibition at the V&A
- Supports immersion in a classic book
- Brings in illustrations inspired by Victorian engravings and paper theatres
- **Tangible Culture + VR**

Key takeaways

- Extended reality is a continuum!
- Mostly categorised in terms of Augmented Reality, Mixed Reality and Virtual Reality
- Tangible culture, intangible culture and natural heritage all make up cultural heritage
- Cultural heritage can be used as data or material for design
- The intersection between XR and Cultural Heritage has a large array of applications

Deep Dive: Augmented Reality and Tangible Culture

Google 3D Animals and Cultural Objects

- Using the Google app, search for an animal or cultural site, and click 3D then “view in your space”
- Full instructions and list of searches: https://support.google.com/websearch/answer/9817187
- **Reflect:** How can you interact with the object? What is the difference between experiencing them in AR and viewing 2D images (if any)? What is the added value of the experience?

Image: Scott Stein/CNET

Deep Dive: Augmented Reality and Tangible Culture

Student questions!

- How does AR technology establish a lasting emotional bond in short-term interactions, rather than just remaining at the surface level of novelty and fun?

How to decide what to augment in AR?

- How do we start thinking about how AR can support engagement with tangible culture?
- Look to museum studies:
  - How do people interact with museum artefacts?
  - What is the experience of attending a museum?

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  - How do people interact with museum artefacts?
  - What is the experience of attending a museum?
  - **Model of the Activity of Visiting a Museum**

Sensitisation

- Immersing self in the artefact
- Linking the feelings evoked by the artefact to feelings of everyday life
- Imagining what's beyond the artefact

Analysis

- Diving into details of an artefact
- Analysing the artefact and putting it into context with its history
- Raising questions about the artefact

Tillon, A. B., Marchal, I., & Houlier, P. (2011). Mobile augmented reality in the museum: Can a lace-like technology take you closer to works of art?. In *IEEE Mixed and Augmented Reality-Arts, Media, and Humanities*.

How to decide what to augment in AR?

- Taxonomy for considering what the interaction might look like…
- For example, how might AR provide a richer context about an artefact?
- How might AR support immersion, and a closer connection?

Sensitisation

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Extended taxonomy: AR for Tangible Culture

Communication

- Communicating with the institution
- Communicating with other visitors
- Communicating with the outside world

Sensitisation

- Immersing self in the artefact
- Linking the feelings evoked by the artefact to feelings of everyday life
- Imagining what's beyond the artefact

Analysis

- Diving into details of an artefact
- Analysing the artefact and putting it into context with its history
- Raising questions about the artefact

Personalisation

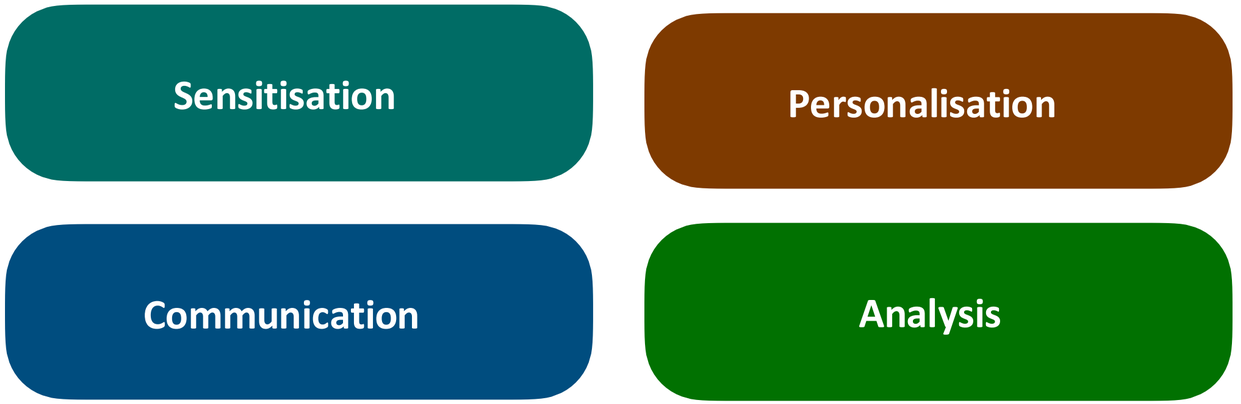
- Personalising content
- Personalising engagement with the artefact
- Personalising visit

Tillon, A. B., Marchal, I., & Houlier, P. (2011). Mobile augmented reality in the museum: Can a lace-like technology take you closer to works of art?. In *IEEE Mixed and Augmented Reality-Arts, Media, and Humanities*.

Čopič Pucihar, K., & Kljun, M. (2018). ART for art: augmented reality taxonomy for art and cultural heritage. Augmented Reality Art: From an Emerging Technology to a Novel Creative Medium, 73-94.

Extended taxonomy: AR for Tangible Culture

- Four concepts that can be focused on
- Not prescriptive
- Aimed as a way of inspiring designers' thinking about the potential of AR for cultural heritage



Čopič Pucihar, K., & Kljun, M. (2018). ART for art: augmented reality taxonomy for art and cultural heritage. Augmented Reality Art: From an Emerging Technology to a Novel Creative Medium, 73-94.

Other dimensions of AR

- How many users can interact at the same time?
- Are we augmenting the user's view? Or the physical space itself?
- What technology are we using?

How might you use this framework to design AR for Tangible Heritage?

https://miro.com/app/board/uXjVJ-8azzU=/?share_link_id=447043389278

Student questions

- How can we avoid oversimplifying [cultural heritage] in AR scenarios, thereby damaging their authenticity and diversity?

- How do the projects ensure ethical representation and avoid cultural misappropriation?

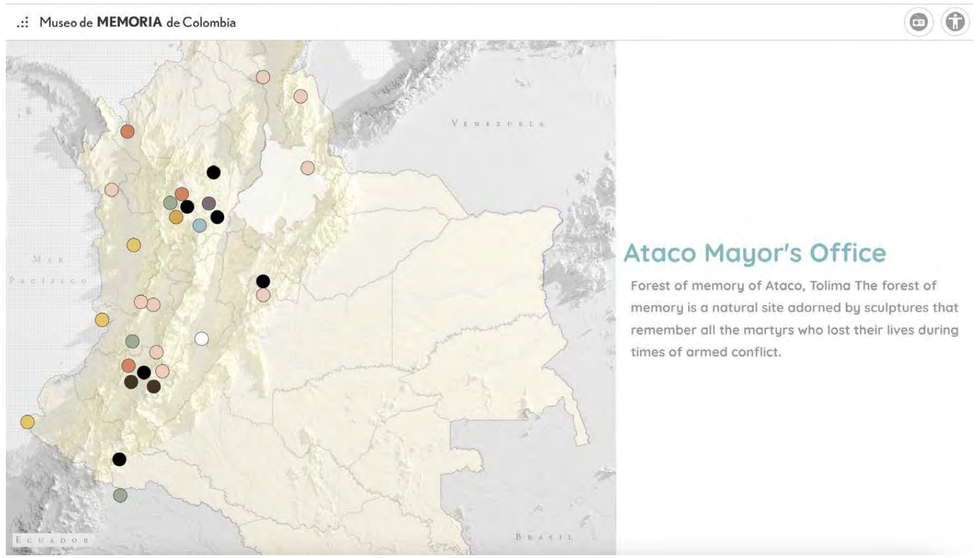
Sensitivities in Cultural Heritage

- Cultural heritage can be a sensitive topic - especially in cases where it is about recent history, or history that shapes our cultural identity
- Colombian conflict: ongoing since 1964, fighting between government, far-left and far-right groups and crime syndicates
- Ceasefire in 2016 but fighting still ongoing with new groups emerging

Cárdenas Gasca, A. M., et al. (2022). AR Exhibitions for Sensitive Narratives: Designing an Immersive Exhibition for the Museum of Memory in Colombia. In *DIS 2022*

Sensitivities in Cultural Heritage

- Museum of Memory in Colombia:
- Concerned with ***memorialization***: documenting and preserving memories of people or historic events
- Physical space under construction



Caminando la memoria
https://museodememoria.gov.co/caminando-la-memoria/

Minga muralista
https://centrodememoriahistorica.gov.co/micrositios/minga-muralista/

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Sensitivities in Cultural Heritage

- Challenge: design an AR experience to engage people with museum's memorialisation efforts
- Main contribution: reflections on the design process and considerations for AR experiences for sensitive contexts
- Example of a Research Through Design study: where reflection on the design process generates new knowledge

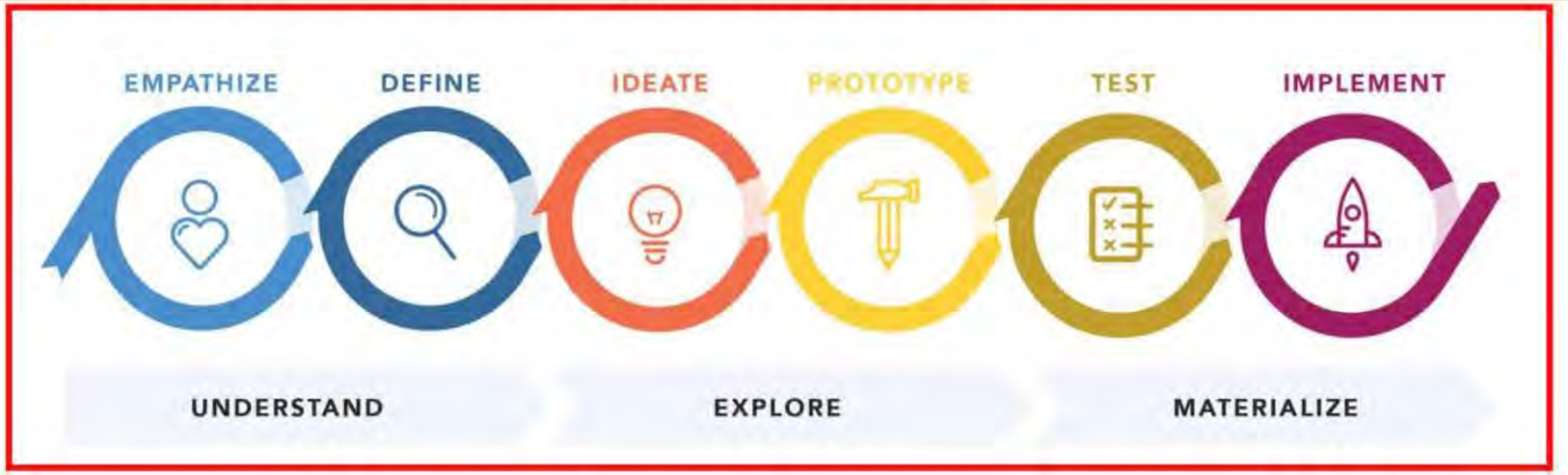
Cárdenas Gasca, A. M., et al. (2022). AR Exhibitions for Sensitive Narratives: Designing an Immersive Exhibition for the Museum of Memory in Colombia. In *DIS 2022*

Research for, into, through Design

RfD = You conduct research without designing something. You have the intention of designing something later on, or to pass what you find out to someone else to design something.

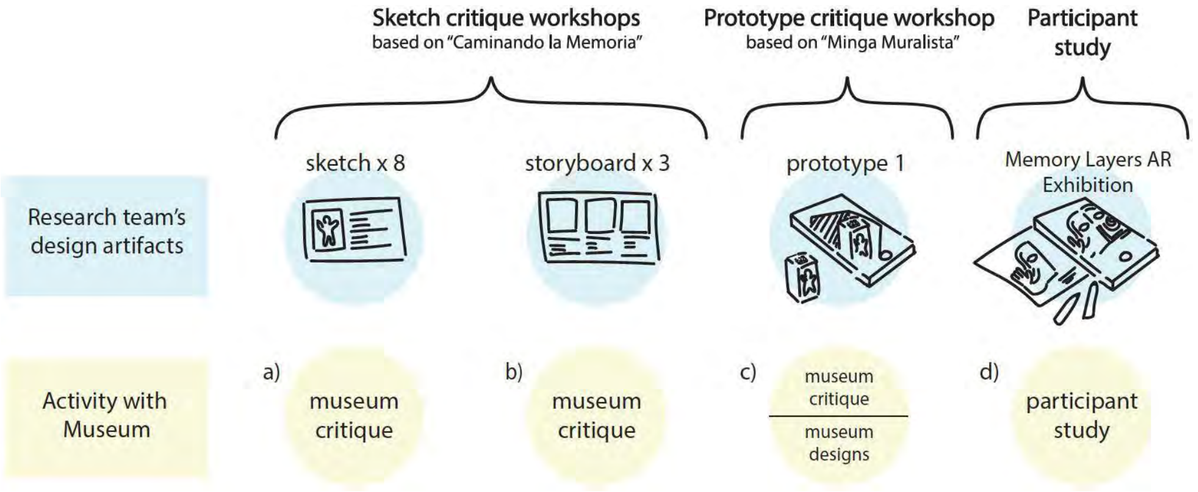
RiD = You conduct research into someone else doing some designing. You have the intention learn from someone elses design process for your own practice, or you are more interested in understanding how people do design than designing yourself.

RtD = You conduct research as part of an iterative design process. You realise / materialize / represent aspects of a design and use research (e.g., engagements with users) to develop your ideas and design as you go along, eventually leading to a refined design.



Sensitivities in Cultural Heritage

- Approach: design with significant input from the museum experts
- Sensitising the museum experts to what is possible
- Co-critiquing alternatives
  (Bear this in mind for the Co- Design lecture in a few weeks!)



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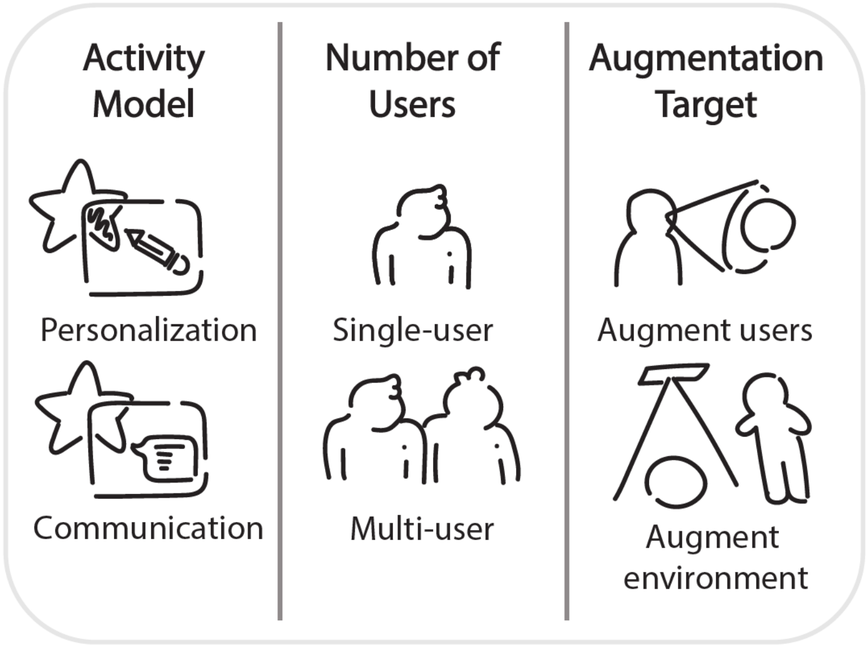
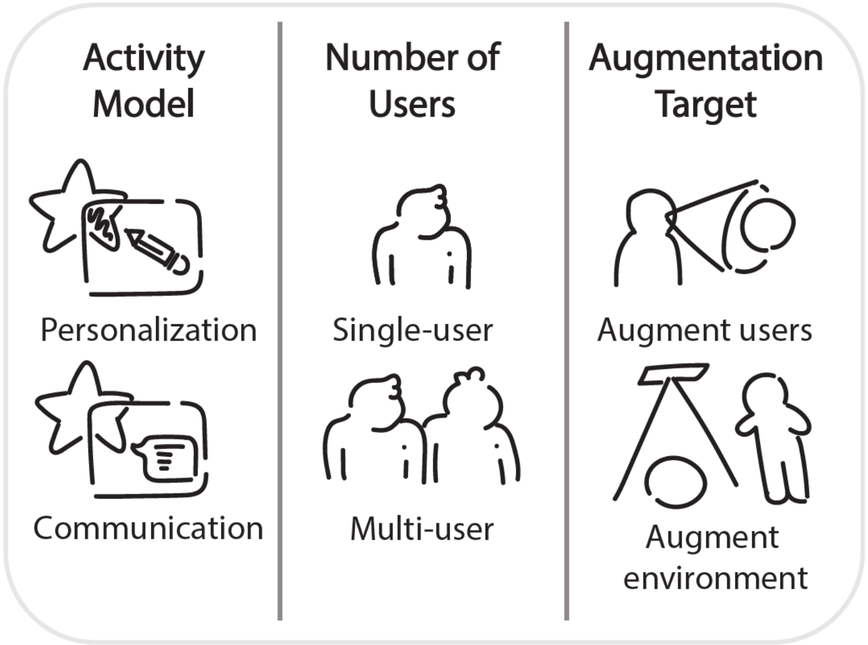
Sensitivities in Cultural Heritage

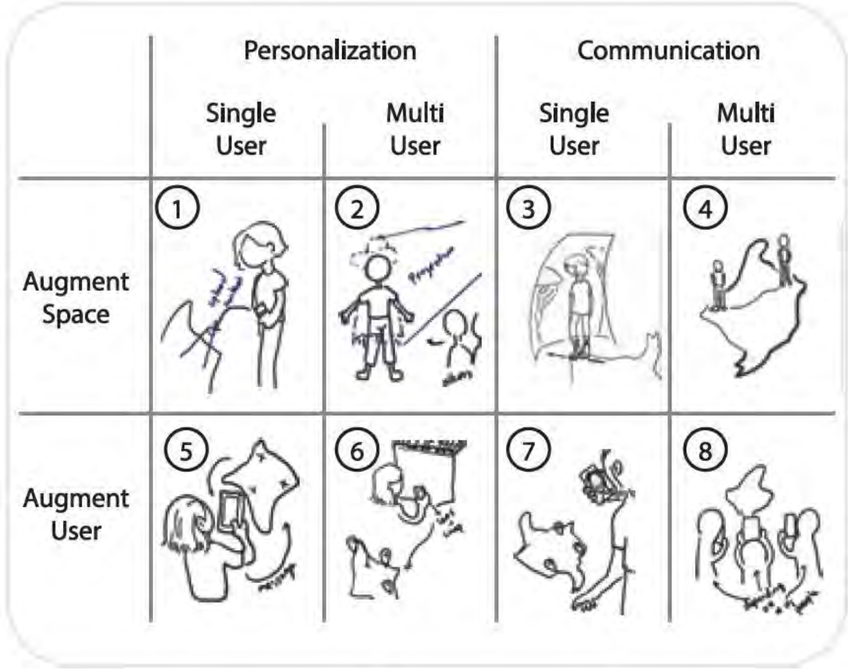


Using taxonomies to scaffold ideation

Cárdenas Gasca, A. M., et al. (2022). AR Exhibitions for Sensitive Narratives: Designing an Immersive Exhibition for the Museum of Memory in Colombia. In *DIS 2022*

Sensitivities in Cultural Heritage

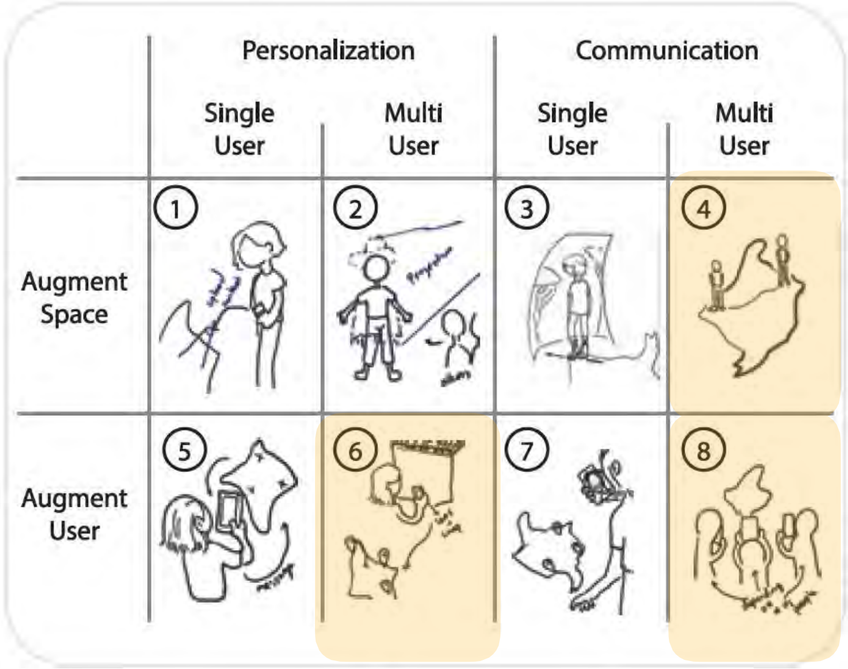




Generating alternatives

Cárdenas Gasca, A. M., et al. (2022). AR Exhibitions for Sensitive Narratives: Designing an Immersive Exhibition for the Museum of Memory in Colombia. In *DIS 2022*

Sensitivities in Cultural Heritage

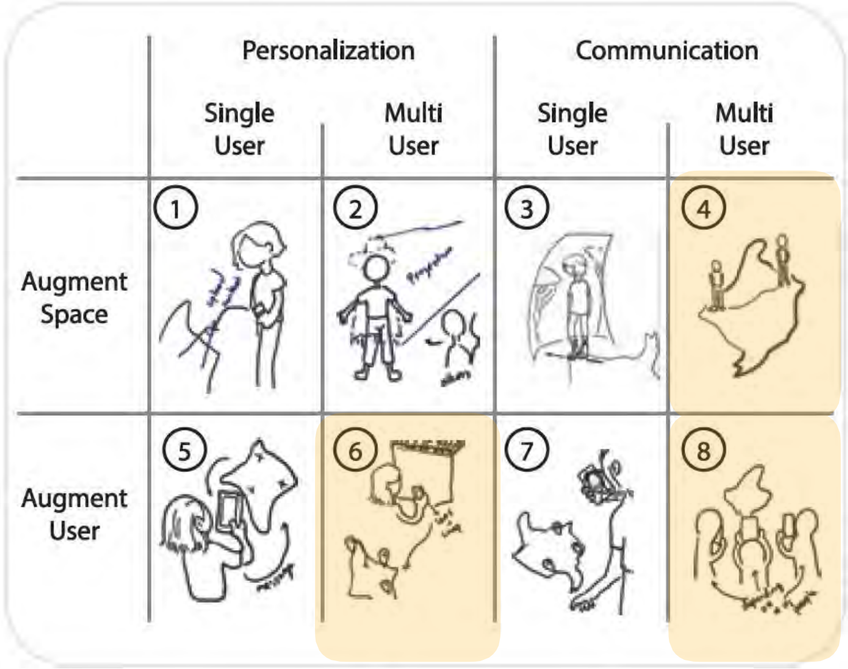


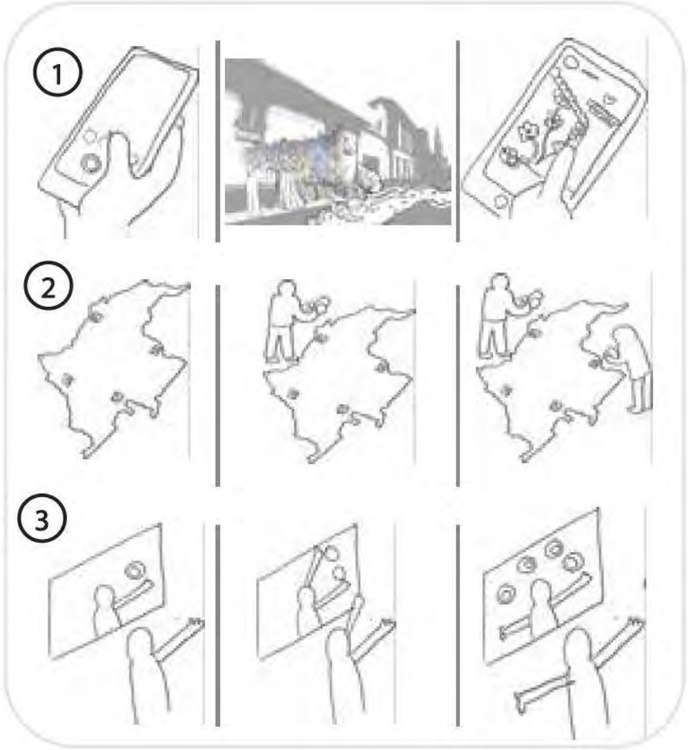
Critiquing with museum experts

- Surfaced considerations about:
  - Museum's core goal of creating connections between audience members
  - Technological gaps in some places - if the exhibition is aimed to be distributed geographically the tech shouldn't be too complex
  - Access to internet being challenging in some rural places
  - Avoiding designs that literally put users "in the shoes" of the victim - recognising audience's privilege

Cárdenas Gasca, A. M., et al. (2022). AR Exhibitions for Sensitive Narratives: Designing an Immersive Exhibition for the Museum of Memory in Colombia. In *DIS 2022*

Sensitivities in Cultural Heritage

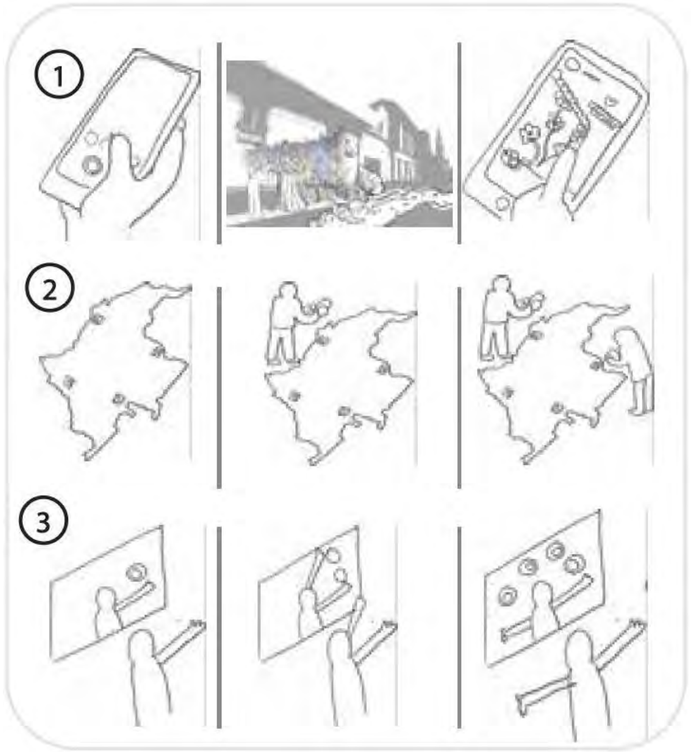




Refining concepts

Cárdenas Gasca, A. M., et al. (2022). AR Exhibitions for Sensitive Narratives: Designing an Immersive Exhibition for the Museum of Memory in Colombia. In *DIS 2022*

Sensitivities in Cultural Heritage

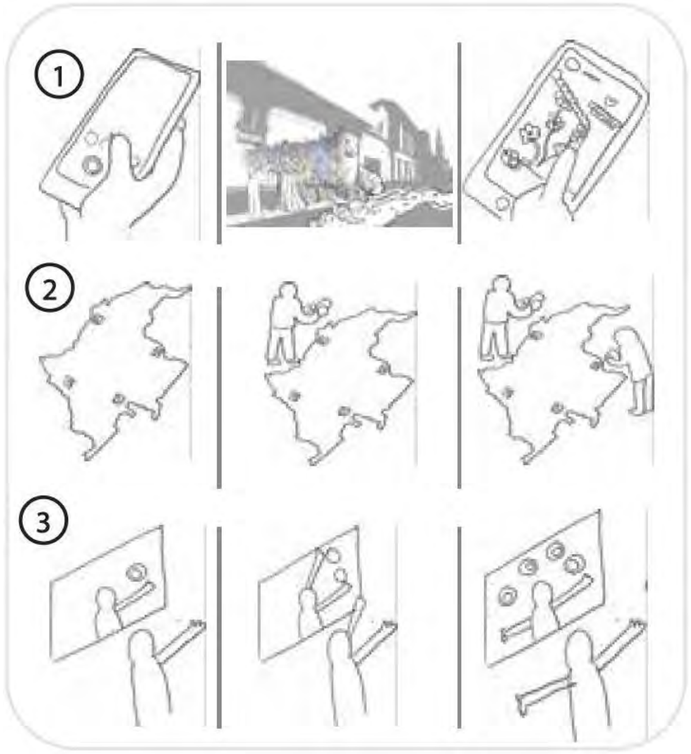


Critiquing with museum experts

1. An app that uses AR camera filter together with a photo-sharing social media platform.
2. A map augmented with markers. Draws information about the connections between the locations on the markers.
3. Position of arm used to control the experience of listening to a testimony story.

Cárdenas Gasca, A. M., et al. (2022). AR Exhibitions for Sensitive Narratives: Designing an Immersive Exhibition for the Museum of Memory in Colombia. In *DIS 2022*

Sensitivities in Cultural Heritage

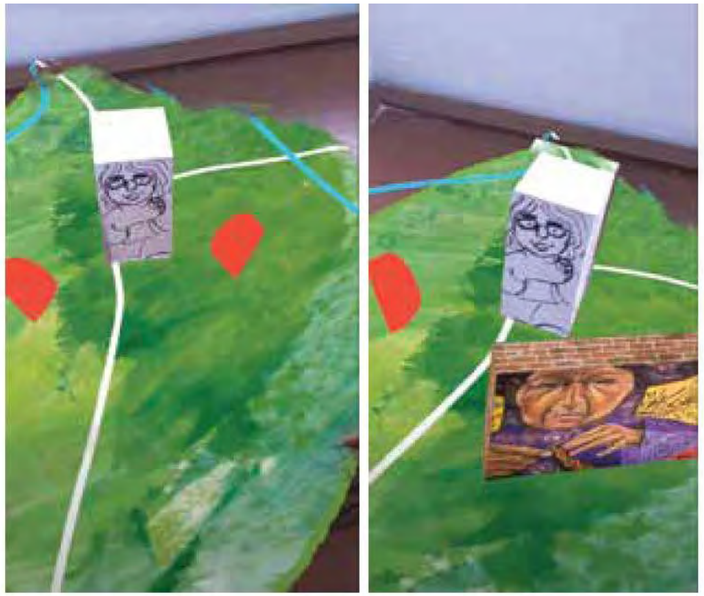


Critiquing with museum experts

- Surfaced considerations about:
- Audience technology literacy
- Experience not just being aesthetic but promoting reflection
- Having audience connect with each other re-emphasised as core goal

Cárdenas Gasca, A. M., et al. (2022). AR Exhibitions for Sensitive Narratives: Designing an Immersive Exhibition for the Museum of Memory in Colombia. In *DIS 2022*

Sensitivities in Cultural Heritage



a) Prototype shown in the workshop

One design concept implemented:

Paper handout with a cutout character that users can personalise by drawing on the paper. Connected to an AR app that can recognise where the character is on the map, and display 3D representations of murals in those places. Idea to connect via social media.

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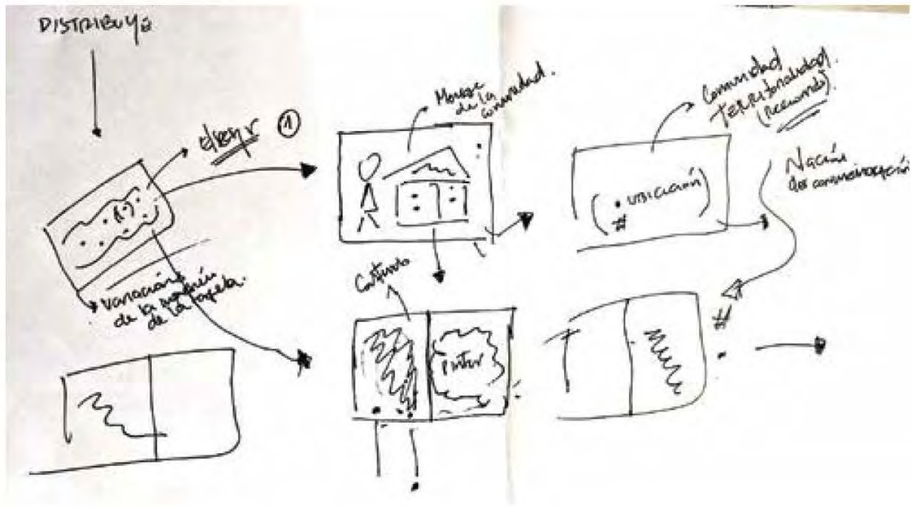
Sensitivities in Cultural Heritage

a) Prototype shown in the workshop



b) Workshop participant sketch

- Surfaced considerations about:
  - Engaging people in sharing their AR experience on social media
  - Engaging people more deeply in the content of the murals (not just showing them)
  - Filtering potentially inappropriate content

Critique and co-design with museum experts

Cárdenas Gasca, A. M., et al. (2022). AR Exhibitions for Sensitive Narratives: Designing an Immersive Exhibition for the Museum of Memory in Colombia. In *DIS 2022*

Sensitivities in Cultural Heritage

- Final artefact:
  - Paper artefacts distributed to visitors
  - Participants colour in the mural, and read explanatory text, then access the AR experience through the Museum's social media. They can share the recording of the experience on social media.

https://youtube.com/shorts/EPt46euMpI4?feature=shared

Cárdenas Gasca, A. M., et al. (2022). AR Exhibitions for Sensitive Narratives: Designing an Immersive Exhibition for the Museum of Memory in Colombia. In *DIS 2022*

Sensitivities in Cultural Heritage

- Includes features that arose from critique/iteration of previous concepts
  - Promotes sharing
  - Relatively easy to use (via Instagram)
  - Doesn’t require specialised tech to take from place to place
  - Doesn’t put audience in the victim’s shoes
  - Text description aims to support deeper reflection on murals

https://youtube.com/shorts/EPt46euMpI4?feature=shared

Cárdenas Gasca, A. M., et al. (2022). AR Exhibitions for Sensitive Narratives: Designing an Immersive Exhibition for the Museum of Memory in Colombia. In *DIS 2022*

Sensitivities in Cultural Heritage

Reflections on the design process

- Design process was iterative where the concept changed and evolved based on feedback
- Involved domain experts at every stage
- Helped the designers more deeply understand the context and the intended audience
- Museum experts were attuned to sensitivities of the memorialisation project, to a deeper level, as well as the needs of the audience
- E.g., important not to put the viewer in the victim's shoes

Cárdenas Gasca, A. M., et al. (2022). AR Exhibitions for Sensitive Narratives: Designing an Immersive Exhibition for the Museum of Memory in Colombia. In *DIS 2022*

Sensitivities in Cultural Heritage

Reflections on the design outcome

- Importance of not providing a purely aesthetic experience but one that promotes analysis and reflection on the content
- Importance of providing context about the artwork (in this case, via text)
- Taking into account the technology infrastructure of intended settings, and the technology literacy of intended audiences

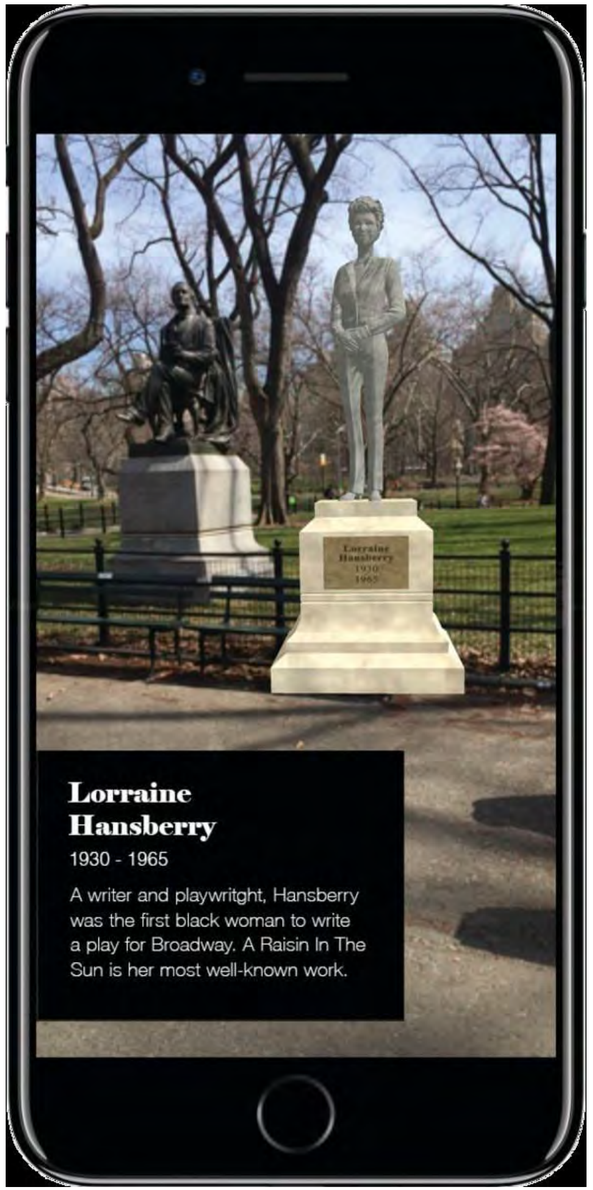
Cárdenas Gasca, A. M., et al. (2022). AR Exhibitions for Sensitive Narratives: Designing an Immersive Exhibition for the Museum of Memory in Colombia. In *DIS 2022*

AR & Activism in Context of Cultural Heritage

Interview study with 20 creators in USA and Western Europe who use AR for ***activism***: action to promote social change

Diversity of cases:

- Art democratisation: Overlaying digital guerilla art (artwork that appears unannounced) over physical paintings in a museum (Netherlands)
- Celebrating women of colour: Displays an artistic holographic monument consisting of images, audio, and animations at a specific location (USA)
- Indigenous cultural awareness: Overlaying videos on cultural sculptures to tell stories (Canada)
- + range of non-cultural heritage cases (e.g., combatting political corruption, environmental awareness, etc.)



https://www.commarts.com/project/11275/the-whole-story-project-ar-app

Silva, R. M., et al. (2022). Understanding AR Activism: An Interview Study with Creators of Augmented Reality Experiences for Social Change. CHI 2022.

AR & Activism

- Why do the creators use AR for activism?
- What are the benefits and disadvantages to using AR in this context?

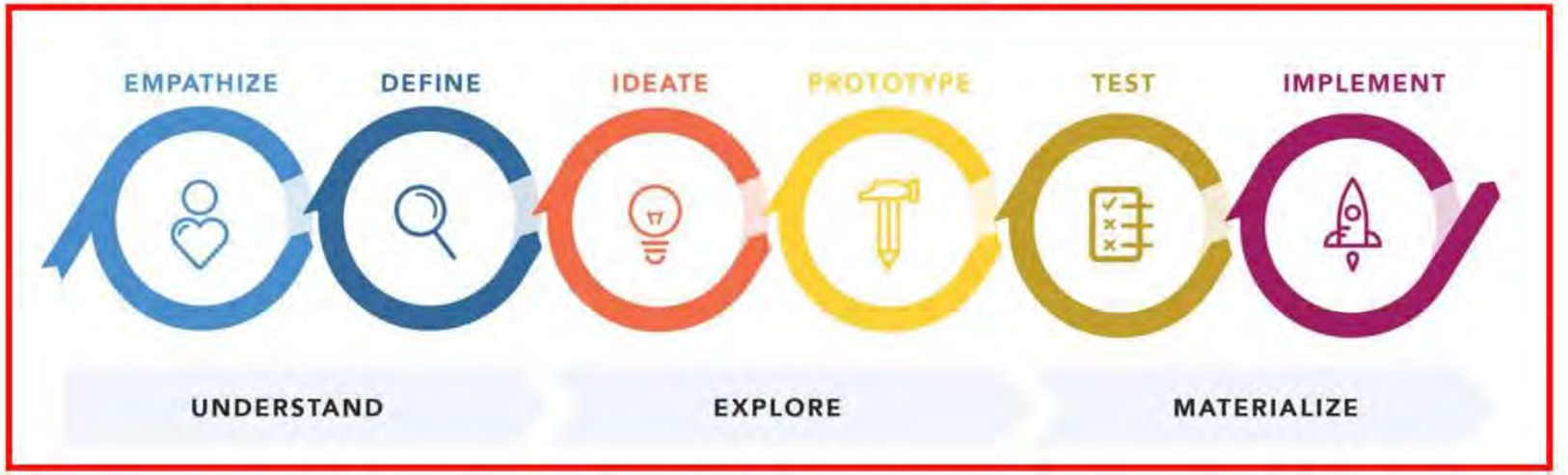
Silva, R. M., et al. (2022). Understanding AR Activism: An Interview Study with Creators of Augmented Reality Experiences for Social Change. CHI 2022.

Research for, into, through Design

RfD = You conduct research without designing something. You have the intention of designing something later on, or to pass what you find out to someone else to design something.

RiD = You conduct research into someone else doing some designing. You have the intention learn from someone elses design process for your own practice, or you are more interested in understanding how people do design than designing yourself.

RtD = You conduct research as part of an iterative design process. You realise / materialize / represent aspects of a design and use research (e.g., engagements with users) to develop your ideas and design as you go along, eventually leading to a refined design.



AR & Activism

Why do creators use AR for activism?

- **Ease of creating content**
  - Large range of platforms available that don't necessarily require programming expertise
- **Potential legal and ethical consequences still being shaped:**
  - Overlaying digital information "seems less risky" than changing physical environment
  - Lack of certainty about legal ramifications due to lack of precedent

Silva, R. M., et al. (2022). Understanding AR Activism: An Interview Study with Creators of Augmented Reality Experiences for Social Change. CHI 2022.

AR & Activism

Advantages

- Adds new layers of understanding to tangible cultural heritage
- Context and meaning

Silva, R. M., et al. (2022). Understanding AR Activism: An Interview Study with Creators of Augmented Reality Experiences for Social Change. CHI 2022.

AR & Activism

Advantages

- Potential to empower underrepresented/marginalised individuals
- Helps question who has a say in what cultural heritage is prioritised? (e.g., statues, artworks)

The Guerrilla Girls

Photo: George Lange

Silva, R. M., et al. (2022). Understanding AR Activism: An Interview Study with Creators of Augmented Reality Experiences for Social Change. CHI 2022.

AR & Activism

Disadvantages?

- **Audience reach!**
- When the experience is restricted to a particular physical space, this can limit reach
- It can be hard to browse for AR experiences on digital platforms (e.g., App Store) - how will people know it's there?
- AR can experiences might also exclude those across digital divide:
  - e.g., Who has access to the required device? Who has access to the internet? Who has the digital literacy skills to engage?

Silva, R. M., et al. (2022). Understanding AR Activism: An Interview Study with Creators of Augmented Reality Experiences for Social Change. CHI 2022.

On the flip side... (student questions)

Are there instances when these technologies cause harm?

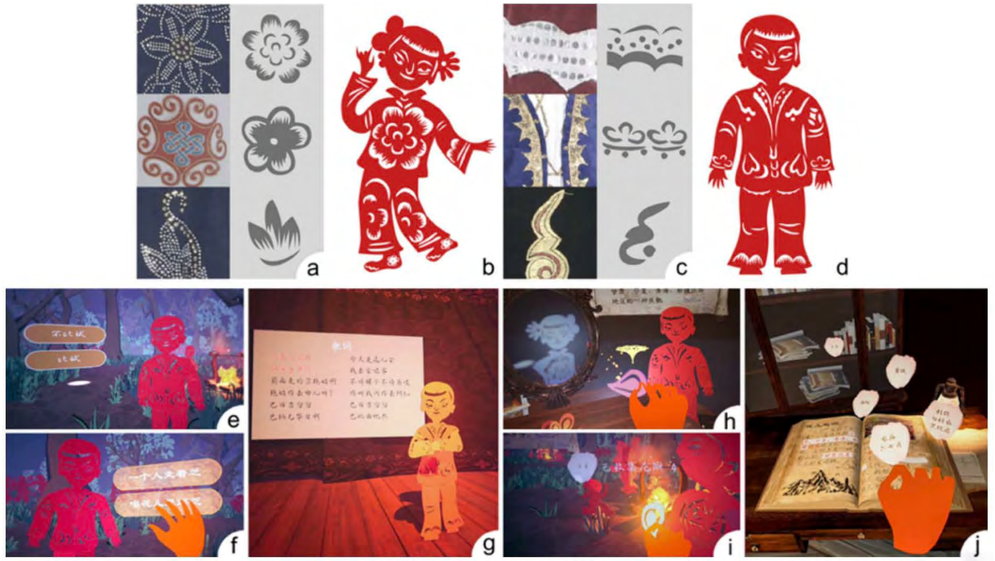
Presenting cultural content through a "curatorial" approach may inevitably lead to the simplification of the diversity within a culture. How can we avoid the AR experience reducing a culture to a single version?

Key takeaways:

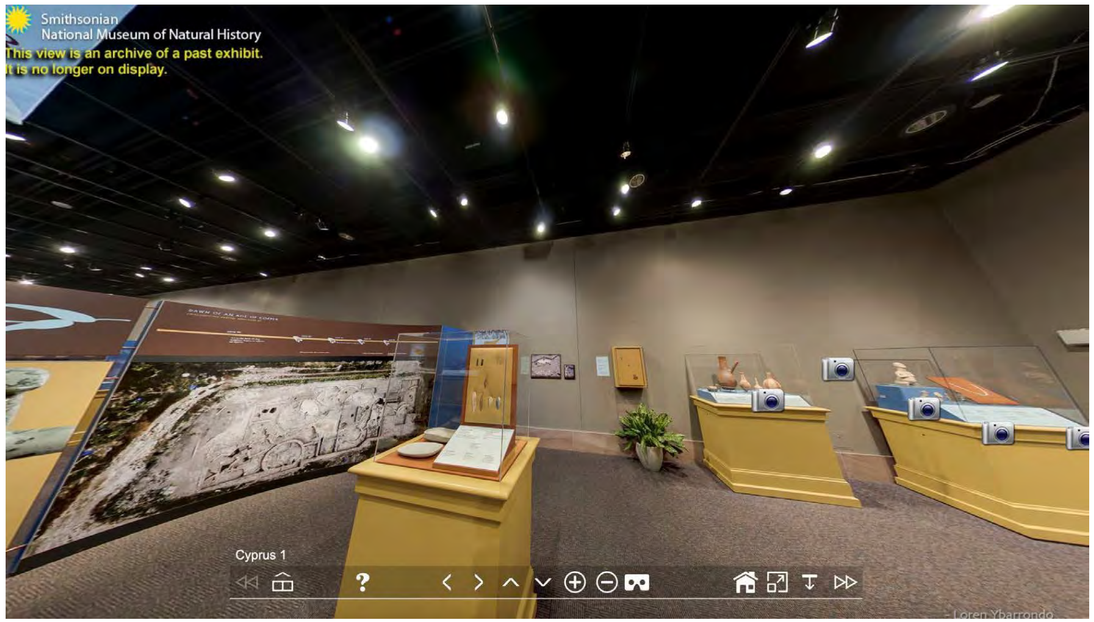
- Framework for AR for Tangible Culture: Personalisation, Communication, Sensitisation, Analysis
- Example of RtD involving domain experts for AR in sensitive contexts
- Value of AR for democratising representations of tangible culture and making visible marginalised voices/stories
- Value of AR for giving context and history to tangible culture
- Questions of inclusion: who is able to access AR experiences?
- Questions of sensitive narratives: how to choose what to represent?

There’s always more!

- Much more to XR and Cultural Heritage
- E.g., VR for Cultural Heritage
  - Enabling people to experience cultural heritage from a distance
  - Storing immersive records of past physical exhibitions
  - Immersing people with intangible culture from other cultures



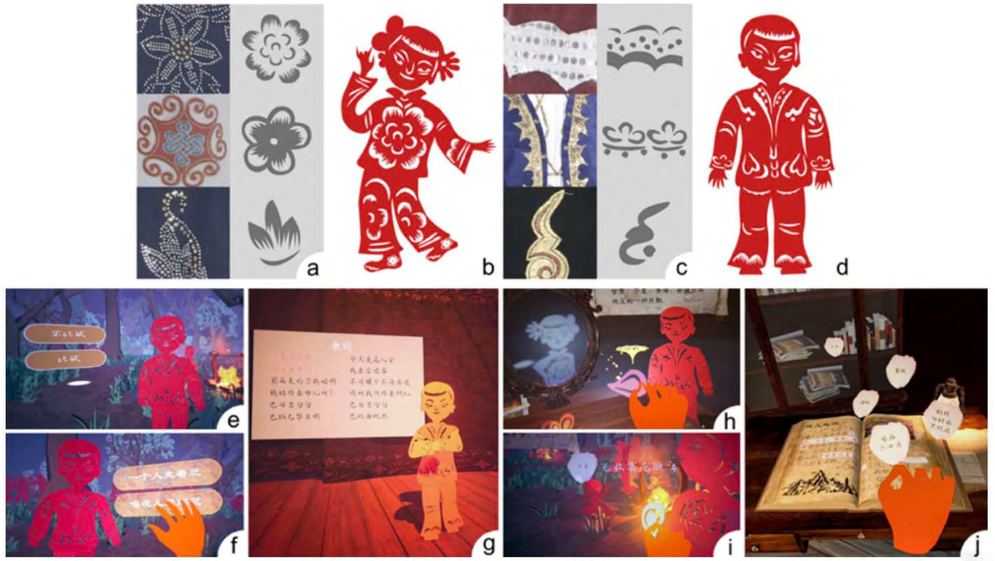
Hua’er (Traditional Oral Performance) in Virtual Reality
https://doi.org/10.1145/3491101.3519761



Smithsonian virtual tours
https://naturalhistory.si.edu/visit/virtual-tour/narrated-virtual-tours

There’s always more!

- All have social, ethical, environmental and legal implications!



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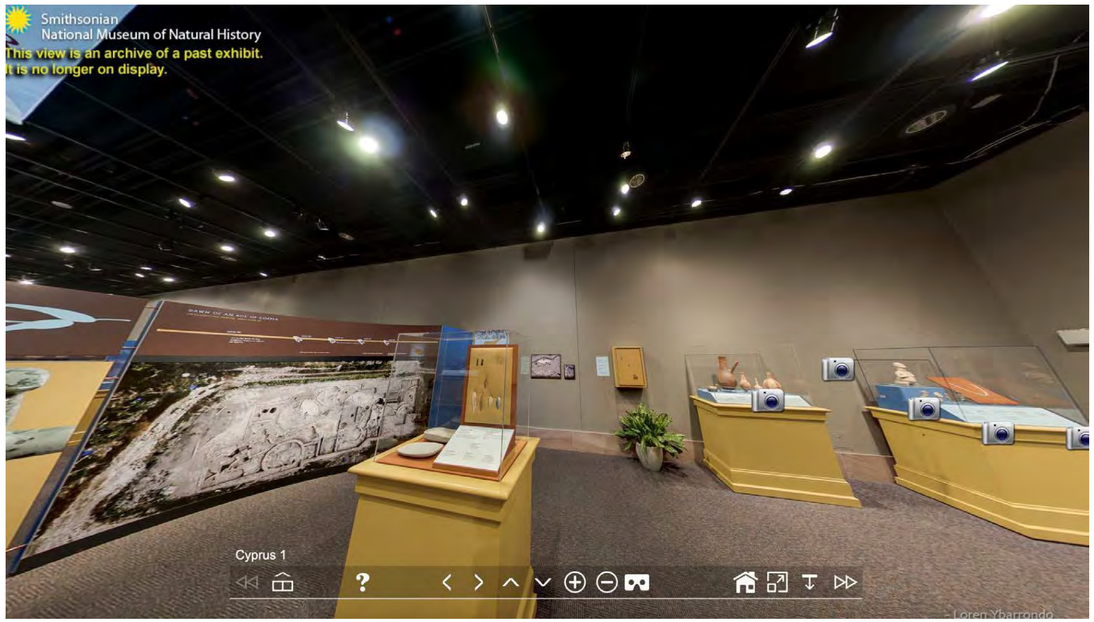

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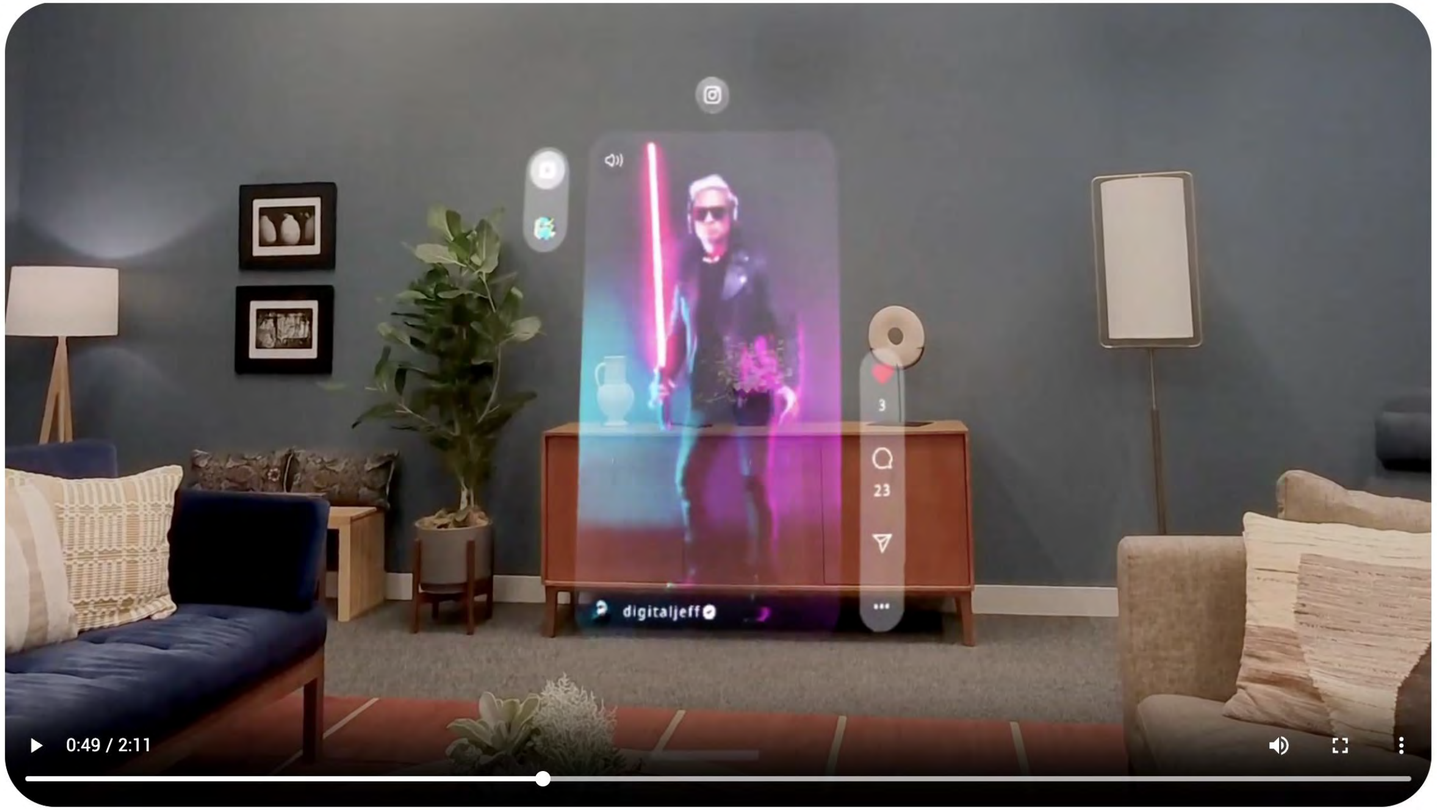
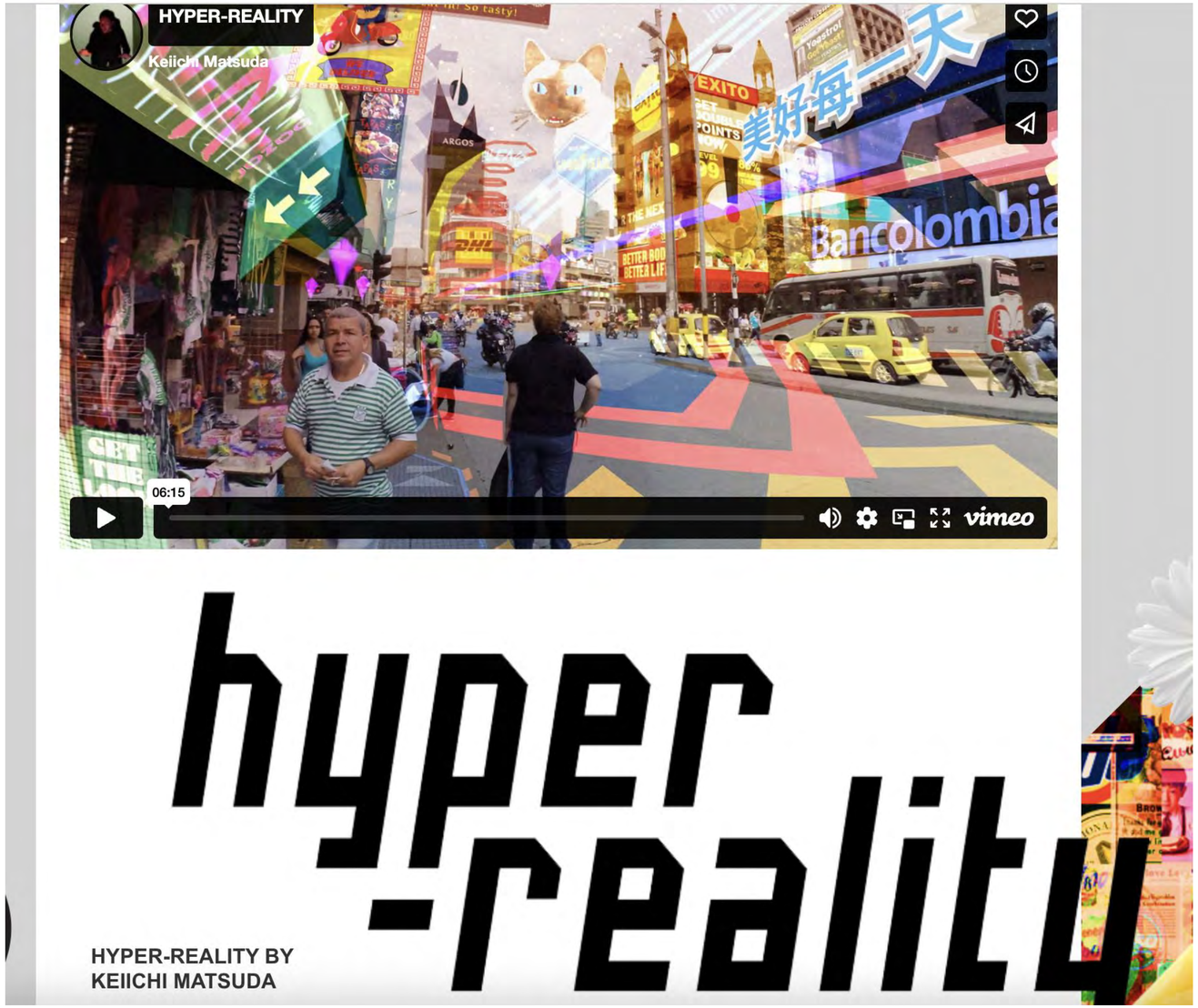
How much XR is too much?



Meta Orion Glasses

https://www.meta.com/en-gb/emerging-tech/orion/

How much XR is too much?



https://youtu.be/YJg02ivYzSs?feature=shared

Student questions for reflection

- While I can see clearly in the cases that the embodied experience achieved with VR/AR can effectively challenge preconceptions and foster empathy, I am still wondering if there's any uniquely irreplaceable drive/need for VR/AR technologies to develop further?

Prep work for next week

i. Choose ONE episode from "The Artificial Human" podcast to listen to. The following are most relevant to next week's lecture, however you are welcome to choose a different one if of interest:

How green is my AI?
Could AI win an Oscar?
Can we stop saying AI can think?

The episodes are available on most podcast streaming services (e.g., Spotify) as well as here:
https://www.bbc.co.uk/programmes/m001wjf8/episodes/player

ii. Optional reading (Not required but an influential paper worth knowing):

Emily M. Bender, Timnit Gebru, Angelina McMillan-Major, and Shmargaret Shmitchell. 2021. On the Dangers of Stochastic Parrots: Can Language Models Be Too Big? 🦜. In Proceedings of the 2021 ACM Conference on Fairness, Accountability, and Transparency (FAccT '21). Association for Computing Machinery, New York, NY, USA, 610–623. https://doi.org/10.1145/3442188.3445922

iii. Optional follow-on from this week:

Try out the Night Walk for Edinburgh, and reflect on your experience – was it enjoyable? What parts inspired you? What might have been improved?

Download and instructions here: https://www.fruitmarket.co.uk/event/night-walk-for-edinburgh-2/

Final remarks

- CW1.1 due next Monday, October 13th, 12:00 – NO EXTENSIONS
- Second tutorial this week
- Weekly office hours with Haili Wu, Fridays, 2-3 pm, in the Design Informatics Studio

Further Reading

- Silva, R. M., Principe Cruz, E., Rosner, D. K., Kelly, D., Monroy-Hernández, A., & Liu, F. (2022, April). Understanding AR Activism: An Interview Study with Creators of Augmented Reality Experiences for Social Change. In Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems (pp. 1-15).
- Cárdenas Gasca, A. M., Jacobs, J. M., Monroy-Hernández, A., & Nebeling, M. (2022, June). AR Exhibitions for Sensitive Narratives: Designing an Immersive Exhibition for the Museum of Memory in Colombia. In Designing Interactive Systems Conference (pp. 1698-1714).
- Maximilian Speicher, Brian D. Hall, and Michael Nebeling. 2019. What is Mixed Reality? In Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems. Association for Computing Machinery, New York, NY, USA, 1–15. https://doi.org/10.1145/3290605.3300767
- Čopič Pucihar, K., & Kljun, M. (2018). ART for art: augmented reality taxonomy for art and cultural heritage. Augmented Reality Art: From an Emerging Technology to a Novel Creative Medium, 73-94.
- Liu, Z., Yan, S., Lu, Y., & Zhao, Y. (2022, April). Generating Embodied Storytelling and Interactive Experience of China Intangible Cultural Heritage “Hua'er” in Virtual Reality. In CHI Conference on Human Factors in Computing Systems Extended Abstracts (pp. 1-7).
- Sabie, D., Sheta, H., Ferdous, H. S., Kopalakrishnan, V., & Ahmed, S. I. (2023, April). Be Our Guest: Intercultural Heritage Exchange through Augmented Reality (AR). In Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems (pp. 1-15).