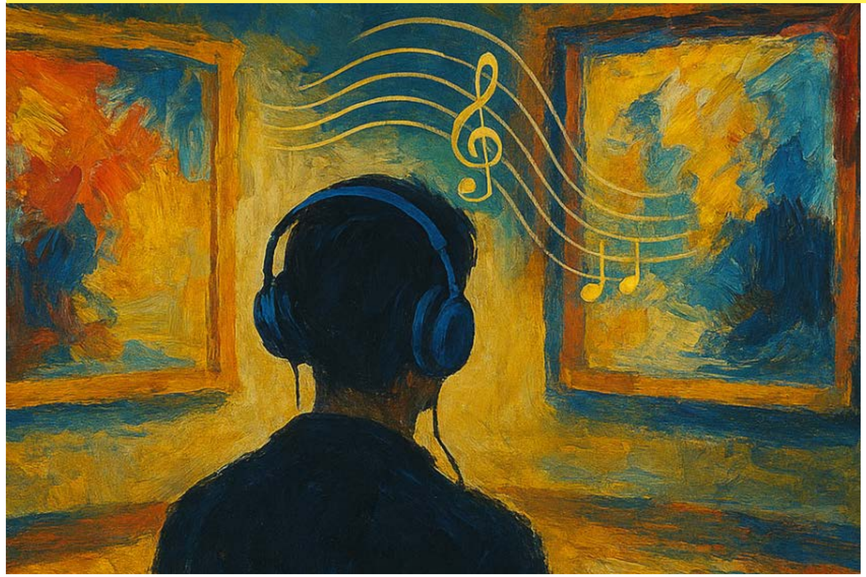
SOUND OF SEEING



2CoDeRs

Mengyuan Zhan | **Lemuria Fay Pernandez** | **Zhuorui Wu**
Lead | Communication | Design

Prisha Kwatra | **Rakshitha Devaraja**
Front & Back End

Combined Strengths

Domain Knowledge
- Interaction Design
- Computer Science
- Architecture & Space
- Art Curation

Technical Expertise
- Backend development
- Frontend/UI development
- UI/UX prototyping
- Visual communication

Methodological Experience
- Design process: ideation, prototyping, iterative design, visual storytelling
- Research methods: design thinking, user research, communication-focused exploration
- Development workflows: GitHub project management, integration of design and code

Collaboration Style
- Strong communication focus—ensuring all voices are heard and balanced
- Clear task delegation and transparency through GitHub and Discord
- Inclusive and supportive environment with open feedback and adaptation
- Coordinated integration across design, frontend, and backend for seamless outcomes

Collaborative Focus

We combine strong coding, design, and HCI research expertise, using prototyping, probes, and data analysis to create user-centered solutions. Our diverse backgrounds foster creativity and ensure we can address project challenges from multiple perspectives.

Domain / Problem Space

Exploring social mobile computing in galleries and museums to create **on-site moments** that strengthen **social-emotional connection** through brief cues and micro-interactions, using audio or AR/VR (AI if useful) [1].

Technologies in consideration: AR/VR/AI/AUDIO

Goal: Strengthen social and emotional connection [4] between visitors, the artwork, and each other.

Scope & Boundary: Focus on the in-gallery experience [1] through co-creation [2] or enhance the existing experience by capturing visitor inputs to produce interactive outputs, while using tech only when it quietly deepens social-emotional connection and never pulls attention from the art.

Opportunities identified: Use digital transformation (AR/VR/AI) technologies along with brief visual and audio cues, to create subtle multisensory moments [3] that strengthen social interaction and emotional connection in the gallery.

Key findings from interviews

- A social layer [1] created during the visit or after can enhance the social connection.
  - "I notice it either from whispers around me or when I read reviews online later."
- People want brief [2], human context that connects them to the artist
  - "If there is some sort of media that can easily build connections with me and the author, that would be great."
- Human conversation [3] + story/music builds empathy and meaning.
  - "Seeing an art piece is one thing, but knowing the story… and the accompanying music can make you feel certain emotions"

[1] J. Li, X. Zheng, I. Watanabe, and Y. Ochiai, *"A systematic review of digital transformation technologies in museum exhibition,"* Comput Hum Behav, vol. 161, no. C, Dec. 2024, doi: 10.1016/j.chb.2024.108407.

[2] P. Díaz, A. Bellucci, C.-W. Yuan, and I. Aedo, *"Augmented Experiences in Cultural Spaces through Social Participation,"* J. Comput. Cult. Herit., vol. 11, no. 4, pp. 1–18, Dec. 2018, doi: 10.1145/3230675.

[3] K. Christodoulou, M. Vayanou, G. Tsampounaris, and Y. Ioannidis, *"MagicARTS: an interactive social journey in the art world,"* in Proceedings of the 22nd Pan-Hellenic Conference on Informatics, Athens Greece: ACM, Nov. 2018, pp. 272–277. doi: 10.1145/3291533.3291579.

[4] G. Alelis, *"Exhibiting emotion: using digital technologies to discover emotional connections,"* in CHI '13 Extended Abstracts on Human Factors in Computing Systems, Paris France: ACM, Apr. 2013, pp. 1017–1022. doi: 10.1145/2468356.2468538.

Design Opportunity & Audience

“Most of them are for kids… there’s literally less for adults. And most of the times those interactive spaces are crowded, you have to wait.” - Participant 1

“Of course it makes me feel connected… I feel I’m not alone to think this, when someone else is synchronizing with your thoughts.” - Participant 3

“The most emotional connection I felt was the stickers area… I could feel people’s creativity.” -participant8

Key Aspects

- **Passive & solo**
- **Many interactions for kids**
- **Real cultural resonation**
- **Artist’s intention behind artwork**
- **Quiet & opt-in ways**

Problem Space

How might we make **adult-friendly, quiet-safe, multi-sensory** moments that turn **private feelings into shared meaning—without disturbing others**?

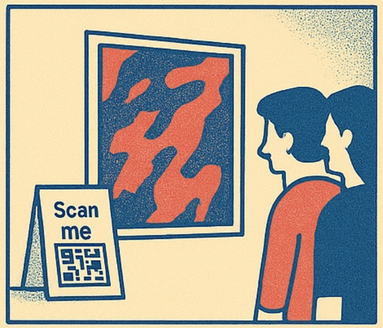
Initial Concepts

Echo Cards - VR/AR multi-sensory boosts engagement [1] (from Story Station) → 10-second feeling → small ARnote near the artwork → others see and react [2].

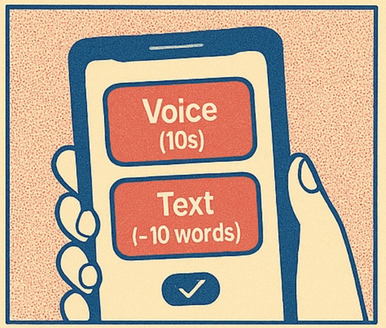
Chain Music (from Mozualization) **Gen-AI co-creation** can link personal memories to heritage, deepening reflection **[3]**.→ feeling → short **sound clip** → clips combine into the room’s **shared song [4]**.

[1] Li et al. (2024). *Digital transformation technologies in museum exhibition: A systematic review* (Computers in Human Behavior). https://doi.org/10.1016/j.chb.2024.108407
[2] Bowen, Rowling, & Kirk (2024). *Story Inspiration Station* (polyvocal prompts). https://doi.org/10.1145/3715158
[3] Fu et al. (2024). *“Being Eroded, Piece by Piece”* (GenAI co-creation & heritage). https://doi.org/10.1145/3643834.3660711
[4] Xu et al. (2025). *Mozualization: Crafting Music and Visual Representation with Multimodal AI.* https://doi.org/10.1145/3706599.3719686

Conceptual Visualisation

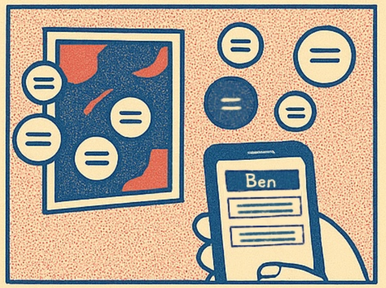


A quict prompt encourages sharing: “10s reflection. Scan. Opt in.

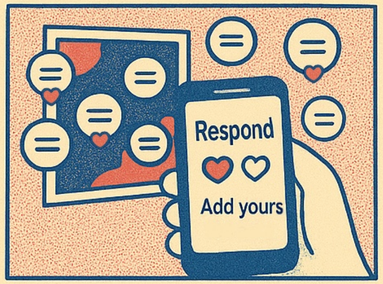


Ben records a short reflection and confirms his consent.

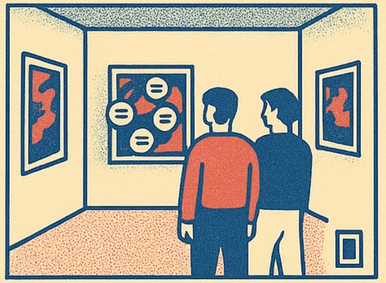
Ben's reflection materializes as a bubble quletly hovering beside artwork.



Ben's friend raises their phone and sees a quiet layer of shared notes floating around the piece.



The friend responds with their own note, adding to shared resonance.



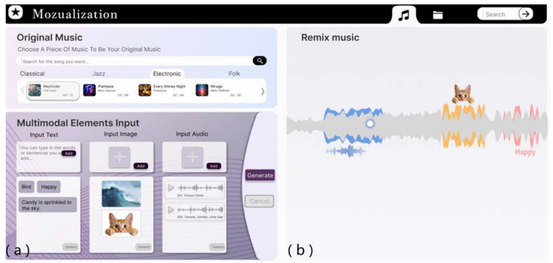
The shared AR layer grows without breaking the silence. Ben and his friend feel connected

Domain & Challenge

Case Studies

[1] Mozualization (2025): Music from multimodal inputs with visual layers, but lacks emotional focus or museum context.

[1] Wanfang Xu, Lixiang Zhao, Haiwen Song, Xinheng Song, Zhaolin Lu, Yu Liu, Min Chen, Eng Gee Lim, and Lingyun Yu. 2025. Mozualization: Crafting Music and Visual Representation with Multimodal AI. In Proceedings of the Extended Abstracts of the CHI Conference on Human Factors in Computing Systems (CHI EA '25). Association for Computing Machinery, New York, NY



[2] Story Inspiration Station (2025): Text-based reflections for artifacts; promotes polyvocality but has no audio/ sensory output.

[2] Simon J. Bowen, Hattie C. Rowling, and David Kirk. 2025. Story Inspiration Station: Deeper Engagement with Museum Objects via Participatory Interpretation. J. Comput. Cult. Herit. Just Accepted (March 2025). https://doi.org/10.1145/3715158

[3] ArtLens: Info/wayfinding; learning focus, not sharing feelings; no co-created trace.

[3] www.clevelandart.org. (n.d.). *ArtLens Gallery | Cleveland Museum of Art*. [online] Available at: https://www.clevelandart.org/artlens-gallery.

Our Unique Approach

- **Innovation 1: AR Emotion Threads (visual):** Emoji or one-line feeling → colored AR threads near the artwork that build up over time.
- **Innovation 2: Music Emotion Layers (audio):** Emoji or one-line feeling (+ optional 3-second ambience) → 10–15s music layer; layers stack into a shared sound (headphones).
- **Innovation 3: Connection & Safety Layer:** Simple queue/slot, quiet "bubbles," clear consent; no face photos saved, opt-in keep or delete.

Comparison

- Artwork-coupled vs generic
- Co-created trace vs isolated posts
- Non-verbal & inclusive vs text/selfie focus
- Quiet & coordinated vs ad-hoc/noisy
- Privacy-first vs unclear

Value

- Visitors: feel seen and connected through others' threads or music; very low effort.
- Galleries: calmer, longer visits; content stays on the artwork.

Process Plan & Next Steps

Project Timeline

Phase 1 (Weeks 3–4):
Research & Observe Literature review
Obesrve visitors in the gallery; note where they pause or wait
Do 10–12 short interviews
Write up key problems

Phase 2 (Weeks 5–6):
Decide & Small Test
Choose the best idea and make a basic demo
Quick tests with around 10 people; fix clear issues
List what we will build for the show (must-have features)

Phase 3 (Weeks 7–8):
Build & Prepare Show
Build the working version; try it with 8–10 visitors in the space
Improve it by making an A2 poster and optional demo video
Get everything ready for the tradeshow

Research & Design Methods

Short interviews in front of artworks (10–12 min)
Quiet observation of visitor flow and waiting points
Small co-design activity to refine prompts and the queue
Quick try-outs of the prototype with clear tasks

Discovery Objectives

- Find 3–5 main pain points and collect real quotes
- See where people need help to take turns and coordinate
- Check basic limits: Wi-Fi, noise, and light in the room
- Understand privacy needs (e.g., no faces saved, clear consent)

Expected Deliverables

- Process summary (what we did and why)
- User analysis (people types + simple journey map)
- Flow map (when people join, create, listen)
- Interactive prototype + short demo video
- Repo & wiki with setup steps and notes