



MUVE

REALM OF RELICS

BRANDON . DARREN . LE XUAN . MICHELLE . RACHEL . YING XIANG

“content”



- 1 *OVERVIEW*
- 2 *APPROACH*
- 3 *IMPLEMENTATION*
- 4 *RESULTS*
- 5 *DISCUSSION*
- 6 *CONCLUSION*
- 7 *REFERENCES*



1

Overview

Problem:

Accessibility to Art and Cultural Heritage

Physical, Financial or Geographical barriers prevent people from visiting museums in person

“Problem Statement”

*By leveraging virtual reality (VR) technology,
how shall we create an **IMMERSIVE MUSEUM**
experience that will make **CULTURAL**
HERITAGE ACCESSIBLE to diverse audiences
worldwide.*

Motivation



EDUCATION



EXPLORATION



FUN

Solution

*MOVE FREELY AROUND
A VIRTUAL MUSEUM*

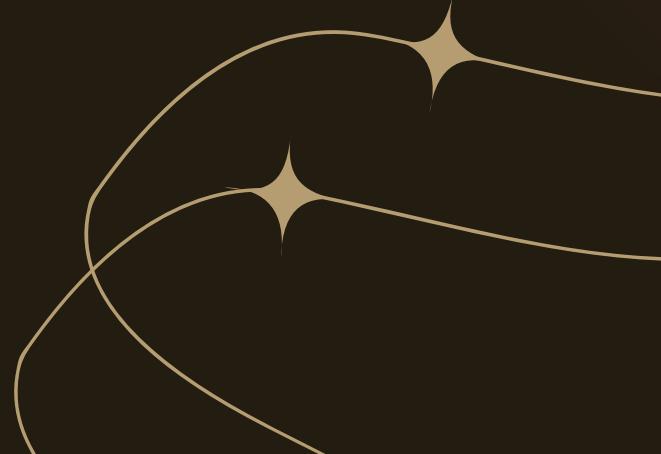
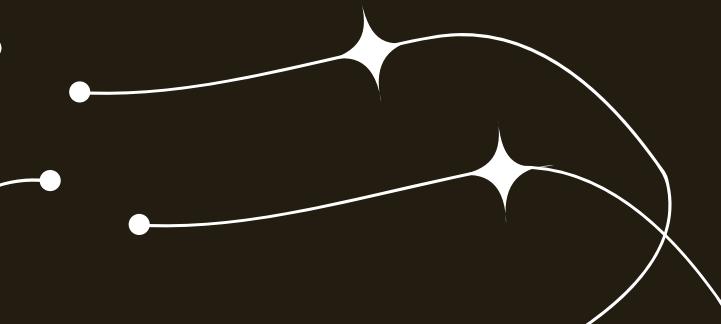
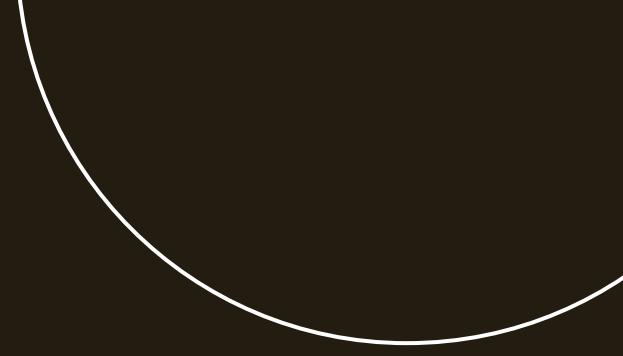
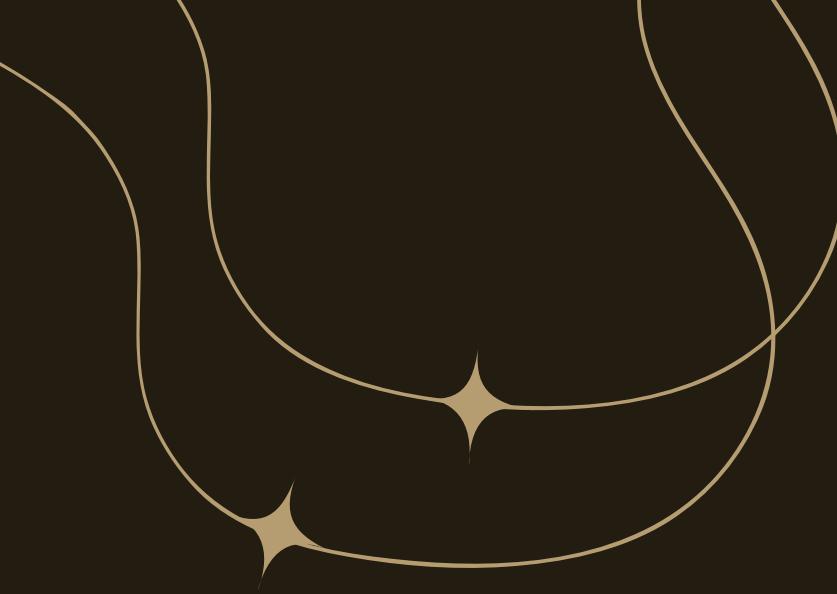
*INTERACT & LEARN
ABOUT ARTIFACTS*

*A MINI-GAME
TO TEST KNOWLEDGE*



2

Approach



APPROACH

3 Key Aspects

APPROACH

User Interaction

2 Movement System

APPROACH

Realistic Artefact Representation



APPROACH

Uniquely Themed Environment



Pipeline Steps

1. Conceptualization and Design
2. Sourcing for artifacts & 3D modelling game objects
3. Virtual Environment Development
4. Interaction Mechanics
5. Simulation of motion
6. Audio Integration
7. Mini Game
8. Testing and Iteration

3

Implementation

Technology Stack

Development Environment:

Unity3D

Programming Language:

C#

Virtual Environment Navigation

Movement via handset joystick (WASD)



Virtual Environment Navigation

Teleportation (step-by-step and multi-storey)



Virtual Environment Artefacts

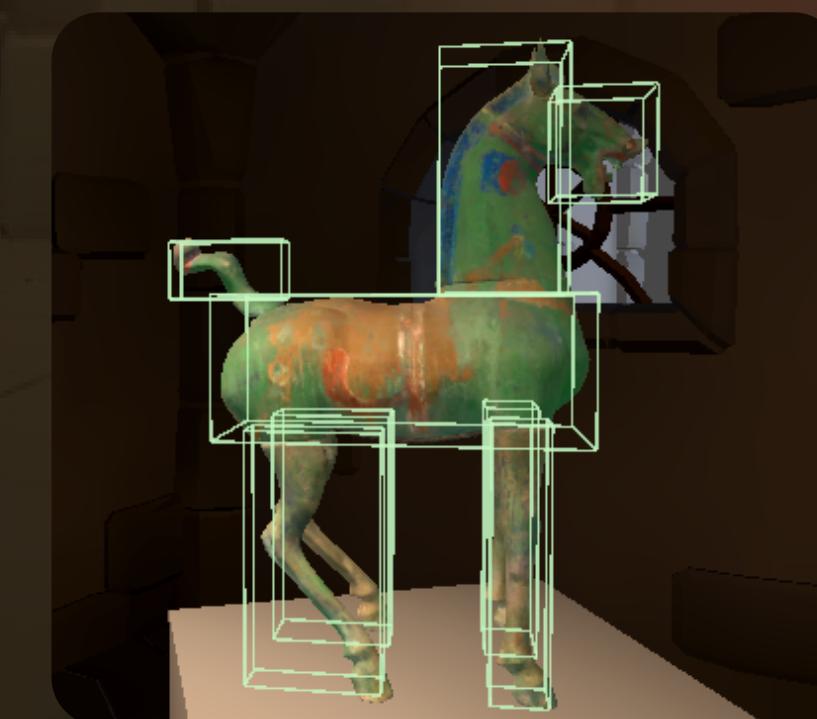
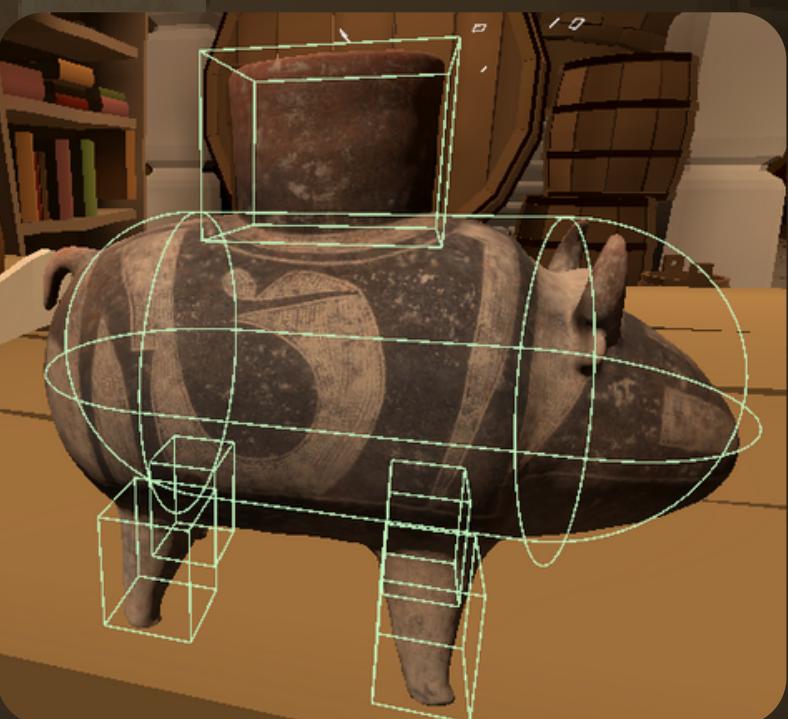
3D models of artefacts from public domain collections

Minneapolis Institute of Art (MIA) and the Cleveland Museum of Art.

Rapa Nui
Moai Kavakava
19th century
Wood

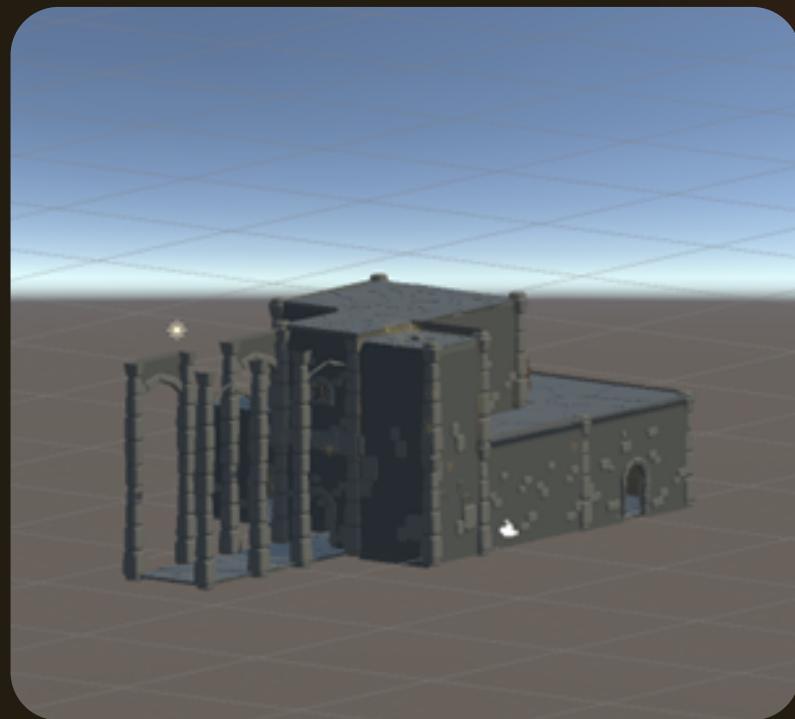
Virtual Environment Artefacts

Colliders were added to each artefact to enhance their functionality and realistic interactions for the users.

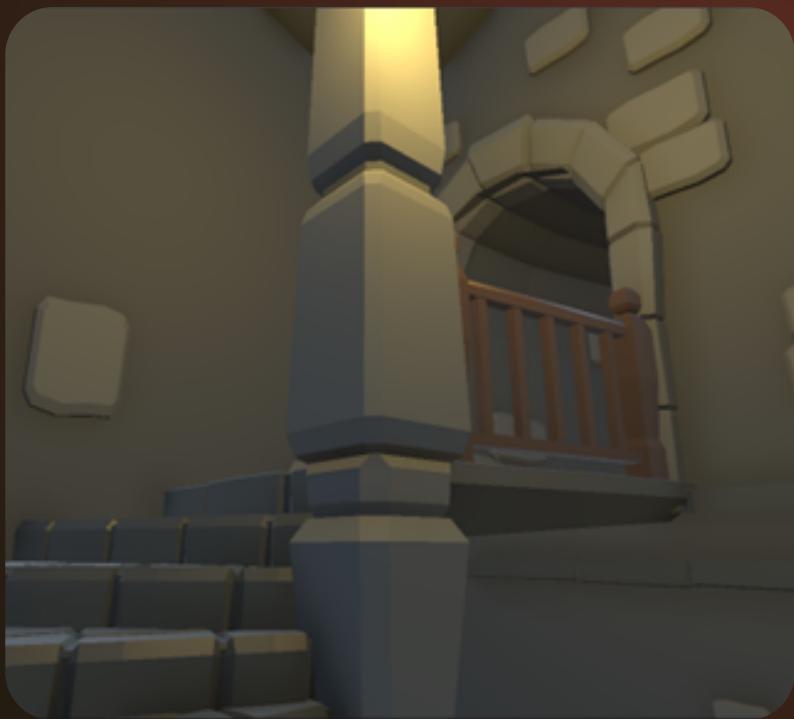


Virtual Environment Building

Used a low-poly dungeon environment asset from open source and free models online



Exterior of Dungeon Asset



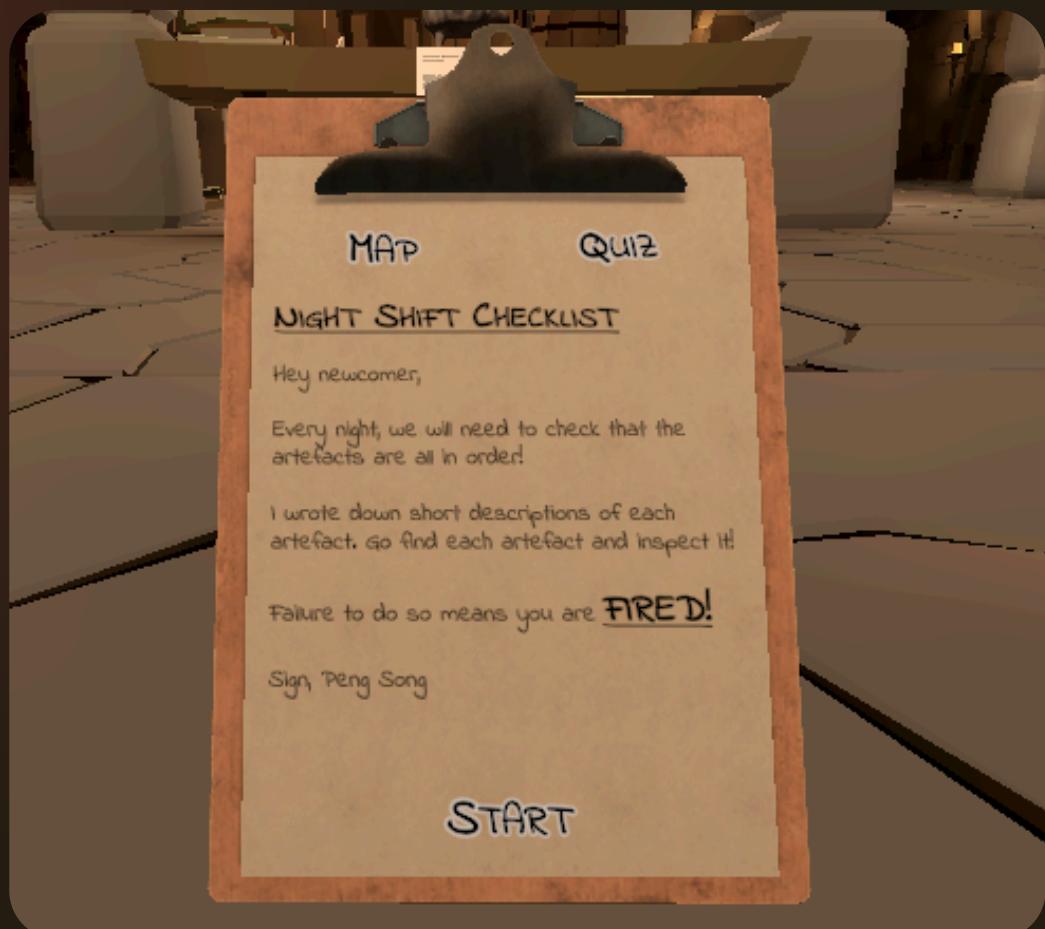
Interior of Dungeon Asset



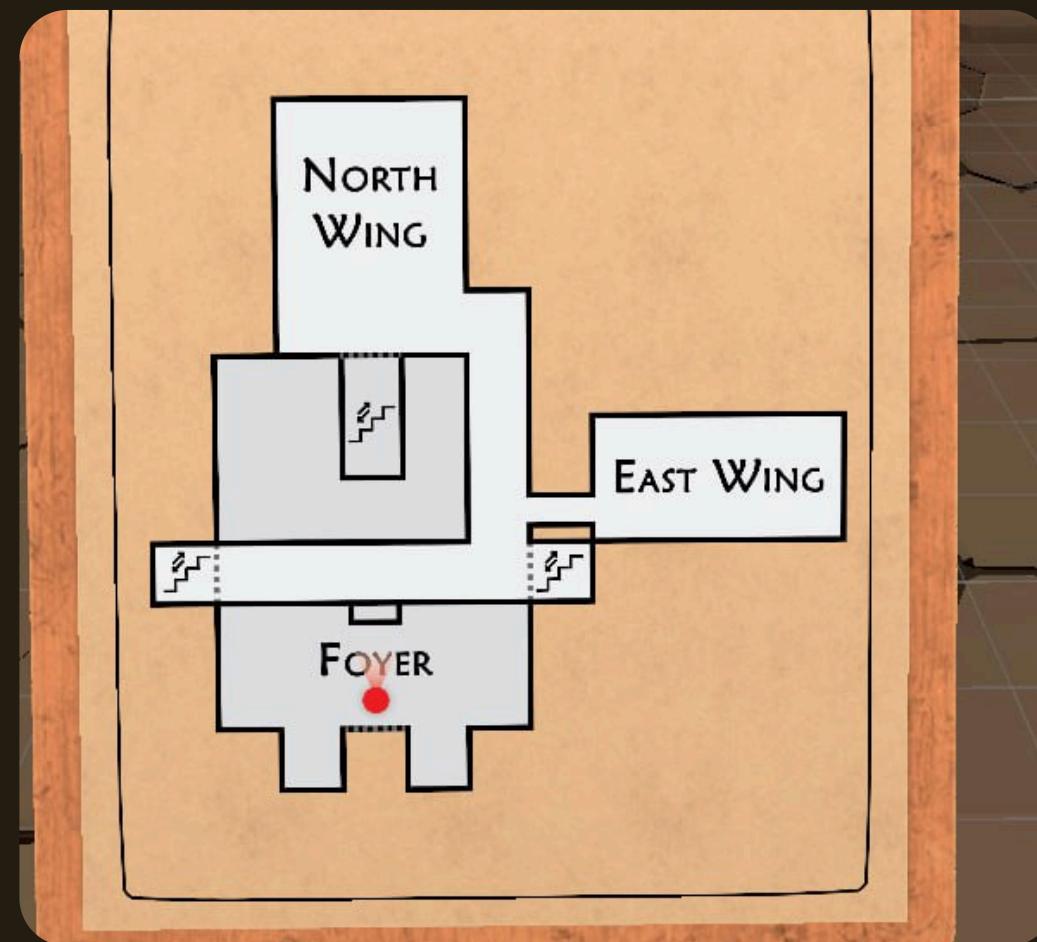
Tutorial Room Asset

Virtual Environment

Customized 3D Assets



Clipboard



Mini-Map

Virtual Environment

Audio

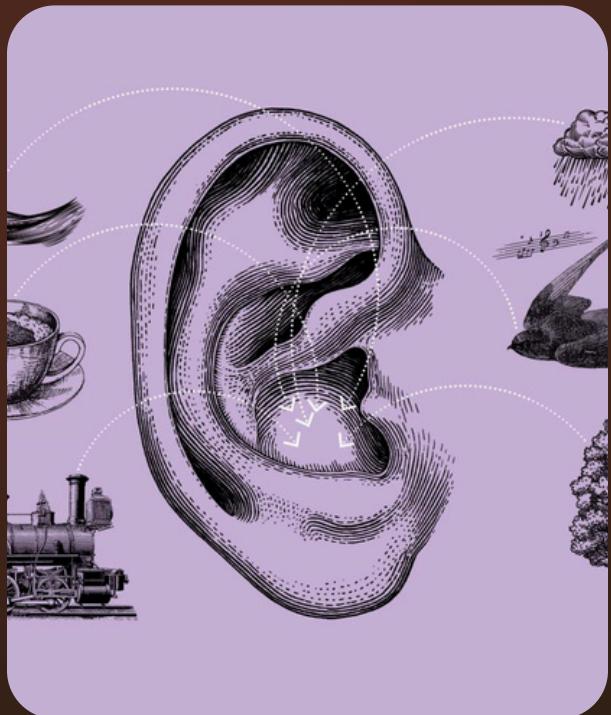
Used AI text-to-speech and sound assets from Unity Marketplace



Artefact



Background
Music



Ambient Noise



UI Sound Effects



Footsteps

Virtual Environment Lighting System

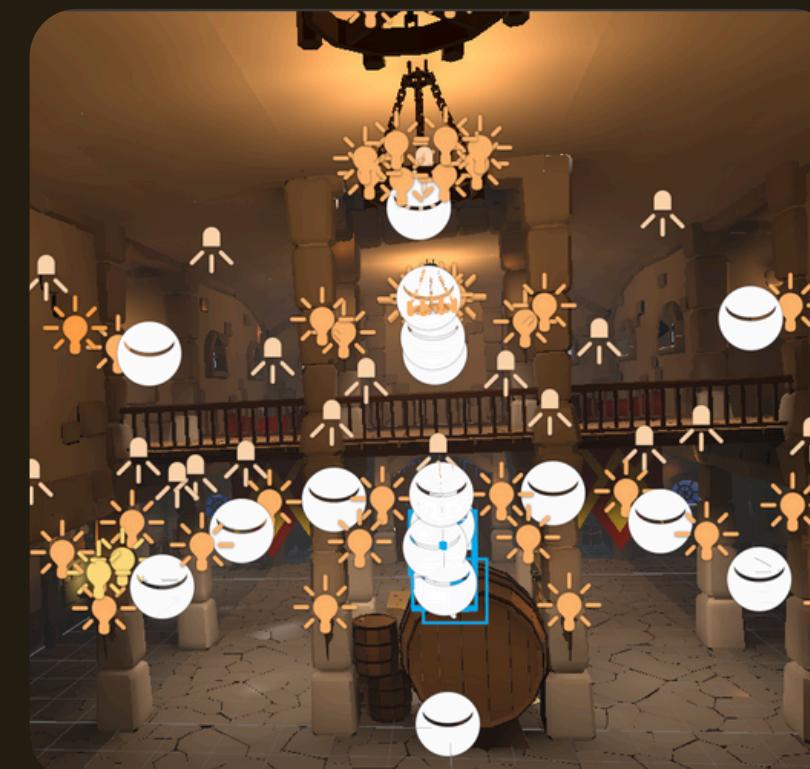
For performance, lights are baked



Light Props



Spotlights



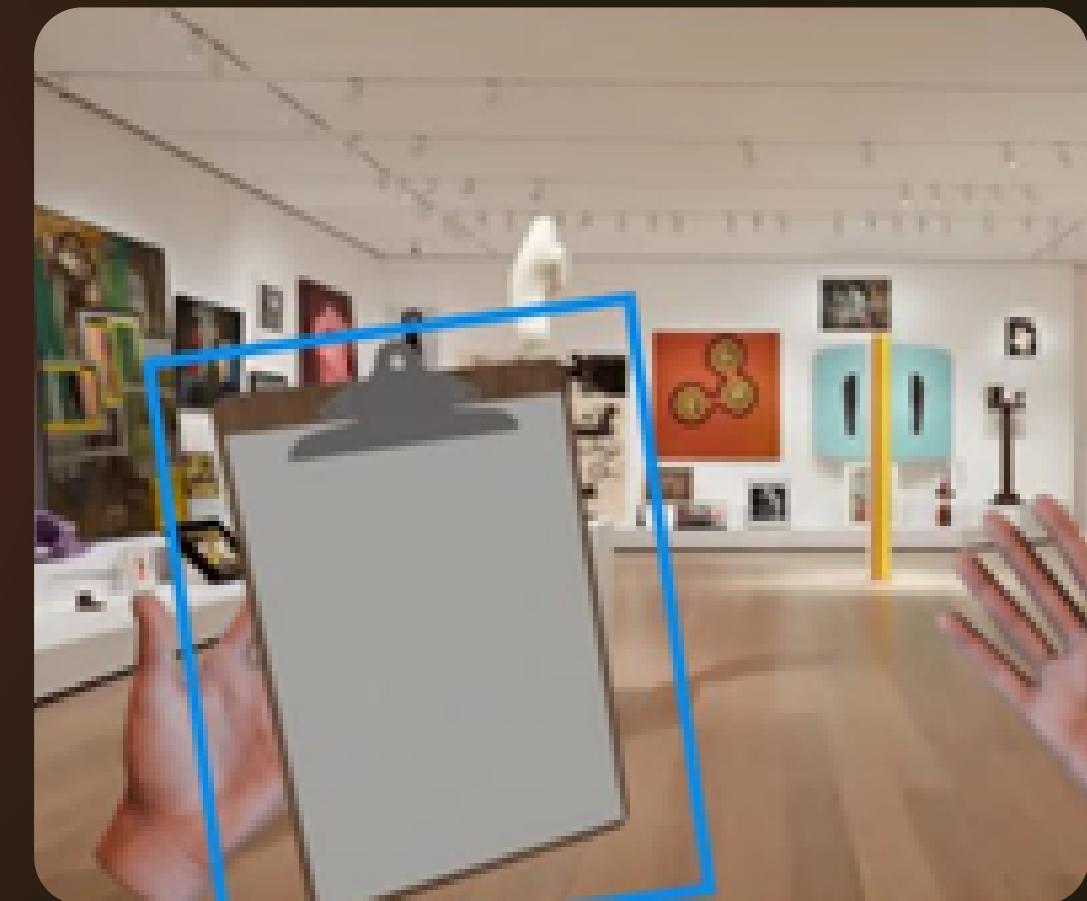
Reflection Probes

User Interface & Interaction

In-Game Interactive UI



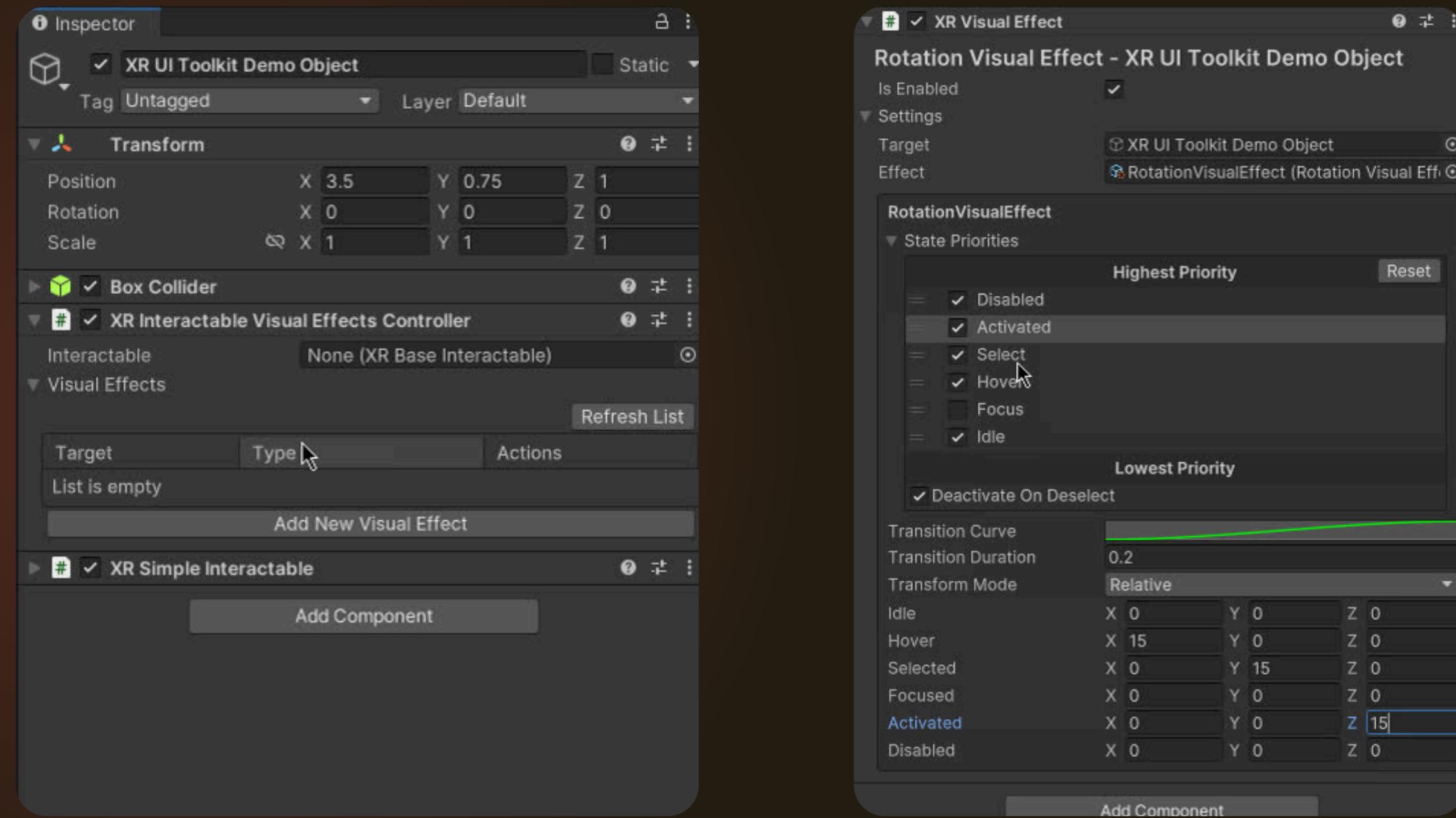
Clipboard Sketch and Moodboard



Clipboard Figma Prototype

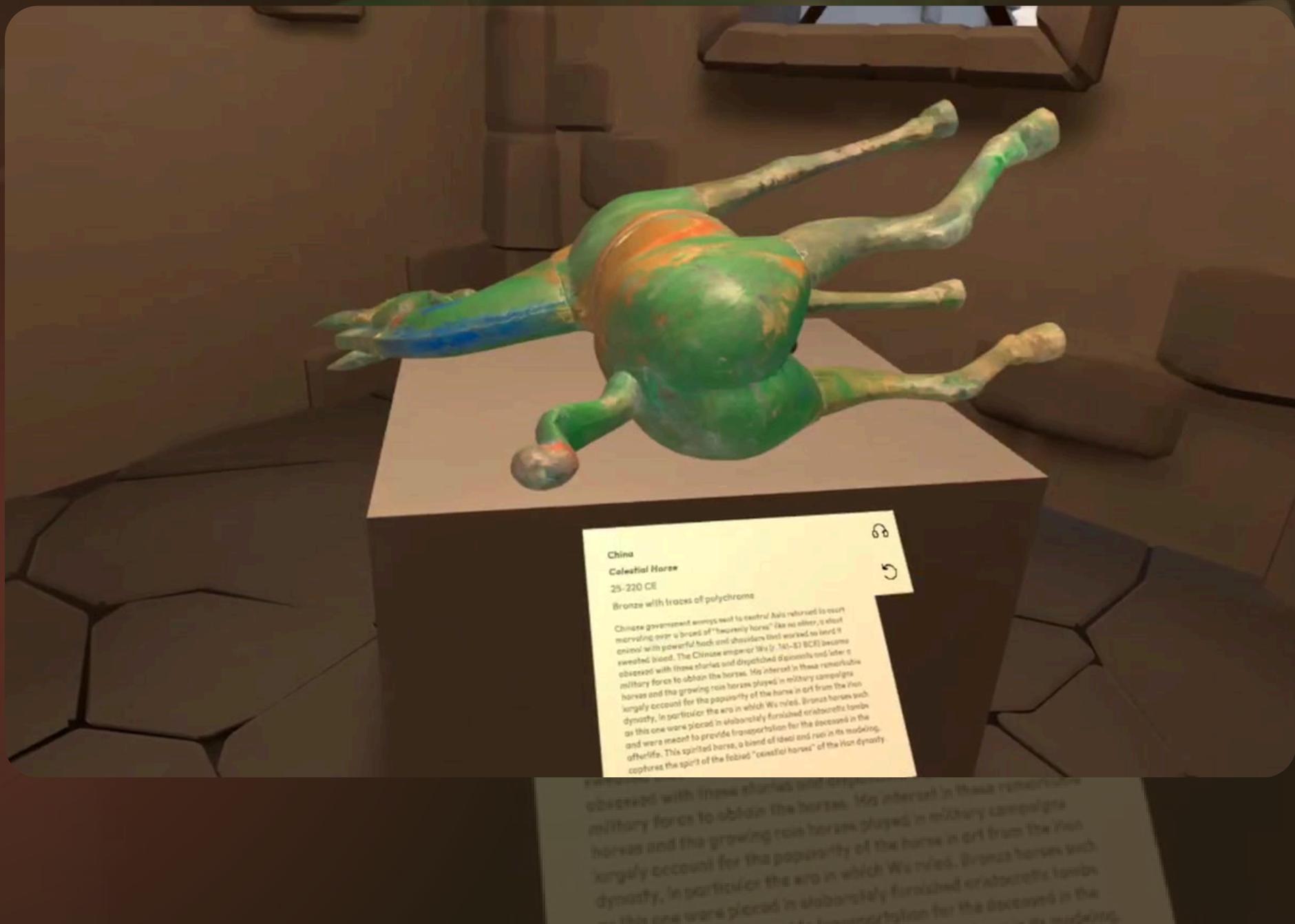
User Interface & Interaction

UI Interaction via custom UI toolkit



User Interface & Interaction

Hand Menu



User Interface & Interaction

Clipboard Menu



Muve - User Interface & Interaction

Object Interaction





4

Result

Live-Demo

5

Discussion

Features



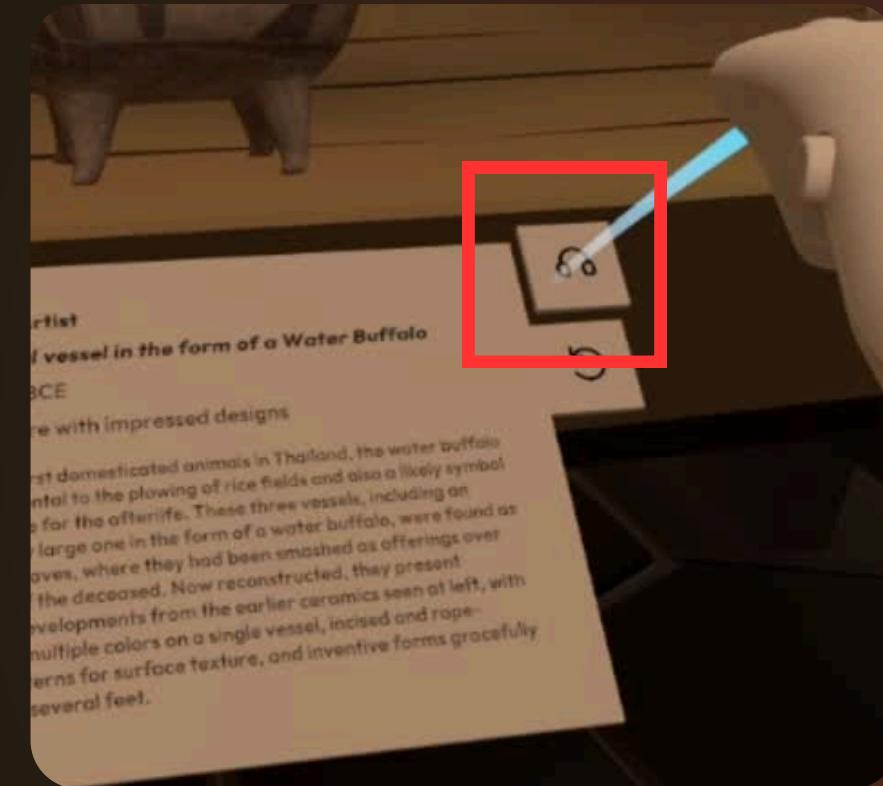
Immersive Environment

Visually captivating experience and engaging atmosphere for users.



Interactive Artefacts

Explore each piece for hands-on learning experience



Audio Descriptions

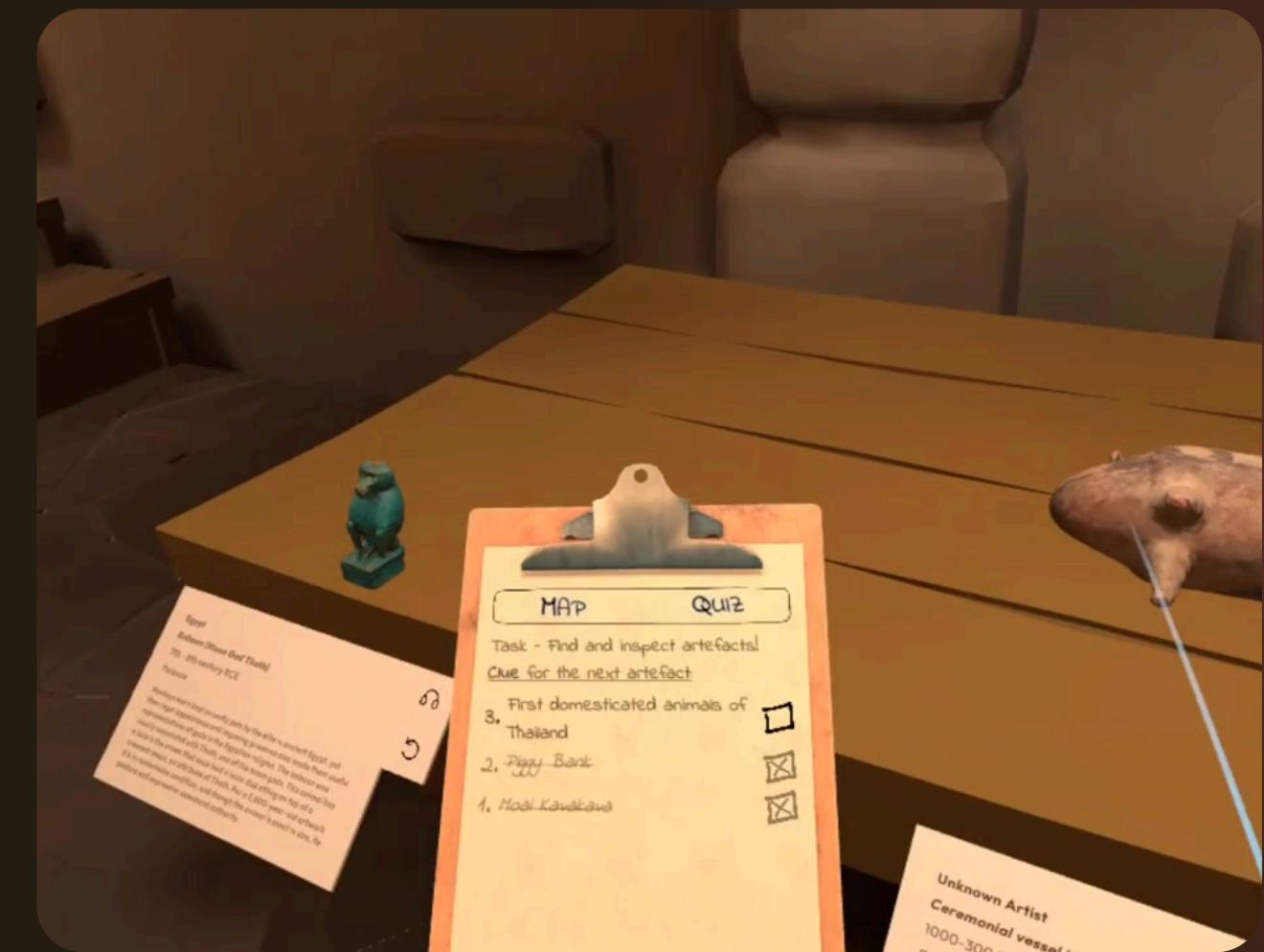
High-quality audio narration of the artefact's description.

Features



User-Friendly Interface

Users can navigate the museum and access information about the artefacts. Tutorial room is available as well.



Minigame

Challenges users to utilize clues provided to complete a checklist displayed on a clipboard

Limitations



Performance Constraints

3D artefacts may lead to performance issues on lower-end devices.



User Experience Variability

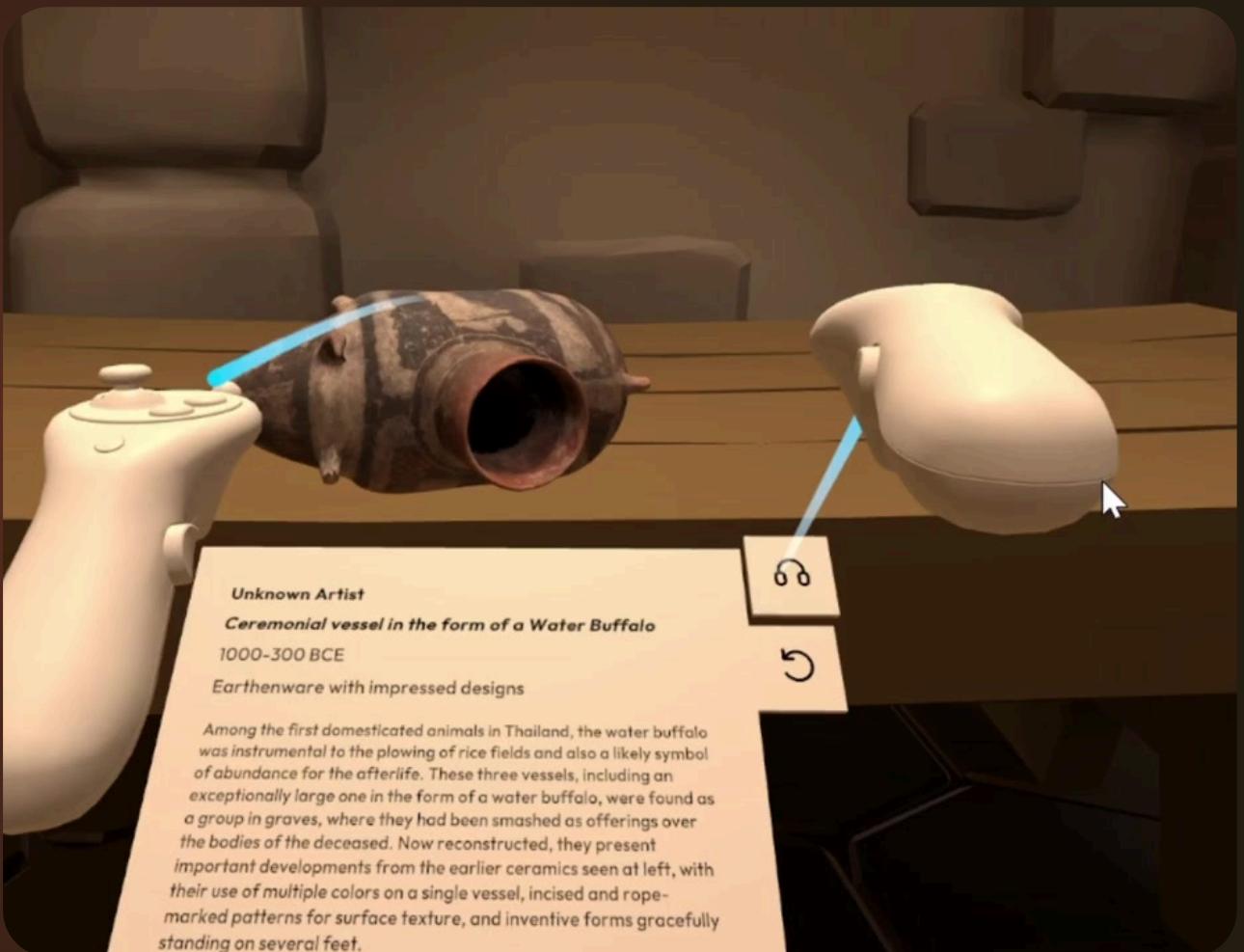
Vary on individual user preferences and familiarity with XR technologies.



Content Limitations

Limited to the Minneapolis Institute of Art and Cleveland Museum of Art.

Future Improvements



Generated Subtitles of Artefact Narrations

Make the description accessible to individuals who are hearing-impaired or those who prefer reading text over listening to audio



Timer in Minigame

Limits the time users have to complete the checklists, forcing a sense of challenge and engagement into the minigame.

6

Conclusion

New Knowledge Gained

- Deeper understanding of Extended Reality Technologies
- 3D Modelling Techniques (e.g. Blender)
- User Interaction Design
- Project Collaboration
- Feedback Integration

Summary:

- Designed for users who wish to explore museums that may be **inaccessible** to them
- Game provides an interactive and engaging environment, transforming traditional museum visits into an **enjoyable and dynamic learning experience**.
- Through thoughtful design, the game aims to **spark curiosity** and **foster a sense of joy** in discovery, ensuring users remain **captivated** while exploring the museum virtually.



Q&A