CSE 490V Final Project Proposal

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1 ELEVATOR PITCH

Most audio focused games are rhythm games. However, this is a very narrow part of the possibilities of an immersive audio game. In this project, we are building a game that focuses heavily not only on audio cues, but also spatial audio. The attendees will explore the scene and navigate themselves to discover different areas following the audio cues in this game. The technical challenges include positional audio, object position tracking, time tracking, lighting and shading, etc.

2 EXTENDED OVERVIEW

This will be an Audio game that takes place in a indoor environment. The player will be presented with a task and they will need to explore and navigate by following the spatial sound cues. The environment will be progressively lit up through the interaction between the player and the environment.

2.1 Technical Challenges

- Challenge 1. Come up with challenges
- Challenge 2. Design and develop a 3D scene in Unity
- Challenge 3. The lighting and Shading of the 3D Scene
- Challenge 4. Research spatial audio and how it can incorporate with the scenes
- Challenge 5: The interaction between the user and the space
- Challenge 6. User experience: how to make the cues easy to follow and to comprehend

2.2 Key Risks and Mitigations

- Risk 1. Lack of familiarity with Unity and Ambisonics
- Risk 2. Limited time to develop a 3D unity scene with good lighting and shading
  Mitigation. Utilize existing 3D Unity Scene and modify the scene based on the design
- Risk 3. The compatibility between the game and the headset
- Risk 4. The design of the game is not clear enough and it will confuse the players
  Mitigation. Conduct simple user research throughout the design process
- Risk 5. The audio quality of the sound effects is not good enough

3 HARDWARE AND SOFTWARE

- [Requested] 2 VR headsets that has good build in audio speakers
- [Personal] A good computer
- [Personal] Headphones and Speakers

Also list the software required to complete your project.

- [Requested] Anything that Douglas might find useful
- [Personal] Adobe Premiere Pro
- [Personal] Audacity
- [Personal] Unity & Steam Sound

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4 TEAM RESPONSIBILITIES

Describe the primary responsibilities for each team member. Remember that the individual responsibilities should be on the order of complexity of two CSE 490V homeworks.

- **Christie Zhao**: Responsible for: (1) Design the game-play sound cues with Audacity/Steam Sound (2) Design Interactive sound effects with the environment (4) Implement the 3D Scene with Unity (3) User Experience Tests
- **Thomas Hsu**: Responsible for: (1) Design a 3D scene with Unity (2) Lighting and shading of the environment (3) Implement interative sound effects with the environment

5 DEVELOPMENT PLAN

- **February 26**: Milestone 1. Finish the design proposal of the game. Decide what the environment will be and what the corresponding sound cues will be.
- **March 6**: Milestone 2. Implement the scene draft and finish collecting all the sound cues and ambience sound
- **March 12**: Milestone 3. Polish the scene and finish incorporate the spatial sound effects to the game
- **March 17**: Milestone 4. Design and implement user interface to enter the game and exit the game. Polish the sound effects and conduct at least 3 user tests.

REFERENCES

- Spatial Audio Explained: Top 5 VR Spatial Audio Platforms and Software
https://veer.tv/blog/spatial-audio-explained-vr-spatial-audio-editing-and-software/
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https://www.frozenmountain.com/developers/blog/archive/spatial-audio-in-vr-why-and-how
- Ambisonics
https://en.wikipedia.org/wiki/Ambisonics
- How to make a VR game in Unity - Part 1 - Setup, Hand presence, Grabbing object
https://www.youtube.com/watch?v=sKQOlqNe$_W$Y