Documentation Focus Project “Terror Formed”

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Project Description

Our project for "Focus Project: Music Technology & Arts" is centered around creating an immersive audio game experience. ‘*Terror Formed*’ envisions a horror experience set on a terraformed Mars, designed to evoke stress, paranoia, and a feeling of isolation through innovative audio techniques. By integrating multi-speaker setups, open headphones, and additional sensory feedback elements, the project aims to enhance the feeling of immersion in location based entertainment.

Project Goals

- Develop a short yet immersive audio game experience.
- Enhance the limitations of traditional headphone immersion by incorporating a combination of a multi-speaker setup and open headphones.
- Investigate the capabilities and limitations of Wwise as a middleware for Location-Based Entertainment (LBE) and game audio.
- (lower priority) Explore additional immersion-enhancing elements, including fans, head-tracking, chair vibrations, and forced feedback on controllers.

Documentation Summary

Project Journey & Technical Progress

First Phase:

- Story and lore development initiated and documented.
- Research on rendering audio simultaneously for multi-speaker setups and headphones, using Wwise and potentially Reaper.
- Open headphones tested in combination with external stereo speakers, proving effective for immersion.
- Git repository setup planned, with challenges in incorporating Git LFS.

Second Phase:

- Project was delayed due to sickness, leading to restructuring of priorities.
- Focus on researching technical solutions over rapid gameplay implementation.
- Test project in Unreal Engine set up, including a decision-making Quick-Time Event (QTE) system.
- AVM room availability issues posed a challenge for final implementation.
- Continued learning and experimentation with Wwise, specifically regarding multi-channel audio output and routing.
- Project planning structured using the "Linear" application to outline the full story and determine the story-scope for the semester.
- Issues with Git LFS and Sourcetree setup on Windows computers encountered and troubleshooting began.

Third Phase:

- Full audio asset list created and prioritized.
- Initial sound design completed, including a "Mars Ambience" track.
- Wwise successfully integrated into the Unreal Engine project.
- Addressing Wwise implementation issues across multiple collaborator computers.
- Established a movement system within the game engine, comparable to a "train ride" through the soundscape.

Fourth Phase:

- Gained access to the AVM studio after previous delays.
- Due to system limitations of private computers, not only the studio's multi-speaker setup but also the studio's computers became essential.
- Encountered difficulties installing necessary software over the university network, as gaming-related websites were blocked, requiring workarounds.
- Successfully tested playing audio from Wwise to the multi-speaker system.
- Explored ASIO output requirements and configured the Windows system for the necessary routing structure, which proved more complex than anticipated.
- Managed to get Wwise working independently with multi-speaker output but faced issues integrating it with Unreal Engine.
- Unreal Engine overrode multi-output settings in Wwise, preventing proper functionality.

- Troubleshooting for several hours did not yield a solution; one potential approach involved setting up multiple Wwise listeners via the Wwise SDK.
- Due to lack of C++ knowledge and time constraints, an alternative solution was implemented:
- One PC runs Wwise standalone, sending 3rd order Ambisonics format out of Wwise to Reaper via ReaRoute.
- The Ambisonics format is rendered to the AVM speaker setup using the AIRA decoder.
- A second PC runs the game in Unreal Engine with Wwise connected, outputting a separate mix to open headphones. Second PC vibrates the controller.

Personal Learnings:

Adam:

- Learned Wwise and its inner workings as well as Wwise and Unreal Engine integration
- Learned the integration of a custom multi-speaker setup in Wwise in connection to the AVM room
- Possible future research and opportunities to expand the lessons learned and integrate a multi-speaker setup and binaural headphone mix on one system.
- Learned how to code a quick time event system in Unreal Engine and integrating different sound events and force feedback for controllers
- Learned how to set up Git LFS and Git Ignore

Johannes:

- Deep dive into Wwise Learning including a full online course
- Setting up Wwise with Unreal Engine also in collaboration with non-audio collaborators
- Git LFS options and installation
- Integration of AVM setup with Wwise & Reaper
- Routing on Windows
- Addressing and working around issues at SRH and school support
- Researching benchmarks for Wwise usage at other LBE sites giving ideas for further development of the project
- Further insights in programming Unreal Engine blueprints