

Collaborative Development of Spatial Audio Virtual Environments

George V. Landon, and Austin K. Jaquith
Cedarville University

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Access to the newest features of Virtual Reality headsets has become increasingly more accessible to student developers in recent years. Manufacturers are competing to support all available device features not just through their Software Development Kits (SDKs), but also integrated into industry-standard game engines. One particular feature, spatial sound, can now be deployed without directly accessing the SDK but instead modifying deployment settings and selecting checkboxes. This accessibility to new VR developers has opened up new opportunities for inter-disciplinary collaborations within constrained development cycles like an academic semester.

In this presentation, we will outline a synchronized multi-course collaboration between music production and computer science students where the end products were multiple music-based VR games where players had to navigate a world filled with spatial audio sources, each assigned to produce a unique stem of music, and rearrange them to recreate the original composition. This work will detail exploration with spatial audio with and without aid by visual feedback, as well as how we implemented this project across two Spring 2020 courses: CS 3950: Virtual Reality Apps and TYMU 2251: Music Technology

At the beginning of the project, guest lectures were given in both of the courses. Music students were instructed on typical workflow for game assets and basic VR requirements. CS students were instructed on introductory concepts of sound design and music theory. The music students composed and produced a piece consisting of 4 looping stems. The CS students then used these stems as direction for developing a virtual environment. Using Unreal Engine 4, Oculus Quest SDKs, and Logic Pro, six different applications were developed and deployed to the Quest VR headset.

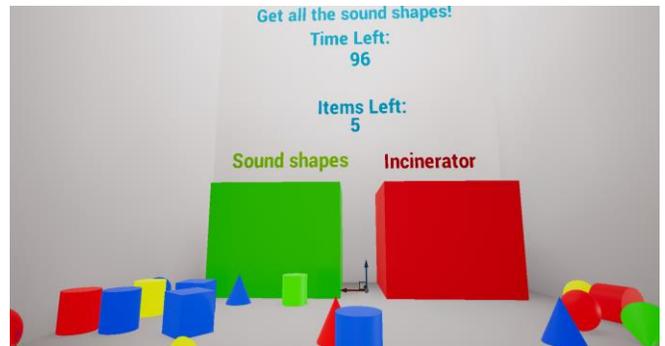


Fig. 1. 3 example screenshots of the 6 spatial-audio apps developed by students during Spring 2020 in CS 3950 and TYMU 2251

Our future work will be to develop a set of recommendations for future collaborations and a set of best practices for audio-only VR using modern headsets.