

Eito Murakami
November 2021

Space 3D VR Demo - Sonic Arts R&D

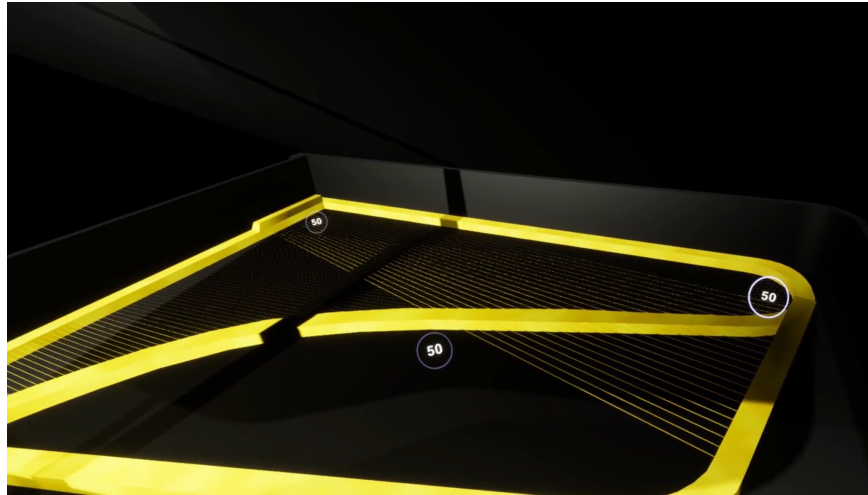


Contributions

Space3D is a realistic spatial algorithm developed at Sonic Arts R&D (Qualcomm Institute), which is capable of recreating the acoustics of the environment based on the virtual models in real-time using advanced multi-processing ray-tracing techniques. As a VR developer, I have been responsible for building an audiovisual infrastructure for interactive demo experience using the Space3D plugin for the Unreal Engine. Specifically, I created a 3D interface that allows one to dynamically change the volume and location of sound sources with a controller. I am also involved in the process of designing 3D virtual environments.

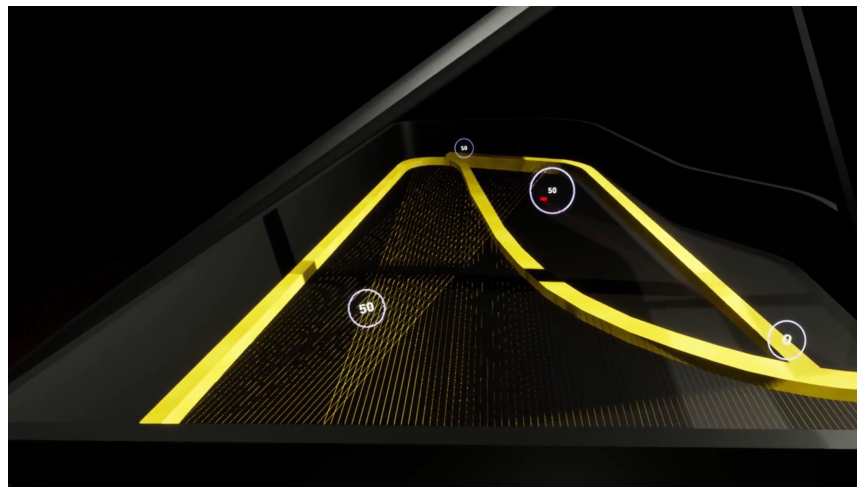
Technical Overview

Sound Source Interface



Each sound source has a ring that provides a real-time visual representation of the source's relative amplitude by changing its size. The opacity of the ring is reduced when a sound source is muted. The number in the middle represents the source's absolute volume with a range of 0 to 100. The number and ring constantly rotate to face the user in order to enhance their visibility inside the 3D virtual environment.

Selecting Sound Sources



The Unreal Engine's collision trace is used to determine the closest sound source that a user is pointing at. A user is able to select a sound source by pulling the controller trigger, which enlarges the volume ring and changes its color. When a sound source is selected, a user is able to

change its parameters, such as mute, volume, and location with the controller buttons, trackpad, and thumbstick.

Lighting



The 3D virtual environment features 5 dynamic and 1 stationary spot lights that cast shadows on the piano complex mesh as well as the floor.