terrain study

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1 PROGRAM NOTES

terrain study is a piece for solo performer and virtual reality system, which seeks to work with the possibilities and limitations of VR outside the usual context of a realistic 3D environment. The player starts in a simplistic 3D world consisting of only three basic elements: a randomly generated, slightly undulating terrain; a texture mapped cube which creates the illusion of an endless horizon (a so- called sky box); and several metal-like spheres hovering above the ground which the player can interact with musically. By and by, the visual and acoustic representation of the game world is manipulated by the sounds produced on the instrument, leading to bizarre structures and surreal perspectives, eventually questioning the division of subject and world.

Fig. 1. Picture of a live performance

2 PROJECT DESCRIPTION

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The performer can move freely within a space of roughly 25 m^2, with his/her field of view being projected on the screen. The quality and height of the terrain directly affects the sound of the instrument, so that movement in space becomes a central aspect of the performance. Furthermore, the head orientation is mapped to different sound processing parameters over the course of the piece, so that the VR headset itself doubles as a musical interface.

When being touched, the sphere objects sample the sound of the instrument and play it back using granular synthesis. They move autonomously in space and the sonic result is determined by the speed of movement and the position within the terrain. All sounds heard in the performance eventually come from the instrument itself; there is no pre-recorded or (independently) synthesized material.

The virtual acoustic space is created with higher order ambisonics. While the binaural rendering – only heard by the performer over headphones – suggests a static environment, the reference point for the audience is the performer's perspective seen on the screen (like in a first person video game), so that the acoustic space is constantly shifting and rotating according to the movements of the performer.

The physical and visual representation of the game world is gradually manipulated, playfully exposing the hidden limitations and contradictions of the VR medium. The dissolution of the 3D space leads to bizarre structures and surreal perspectives, eventually questioning the division of subject and world.

The game environment has been developed from scratch in openFrameworks (a C++ graphics library) to allow maximum control over the low level structure. For the VR headset we currently use the Oculus Rift S together with Steam's openVR SDK. All sound is generated in Pure Data, using the IEM Plugin Suite VST plugins for ambisonic spatialization.

3 PERFORMANCE NOTES

The piece will be performed by Benes on the clarinet. The desired location is a concert stage with the following technical requirements:

- Large 16:9 screen (minimum width: 4 m)
- projector with HDMI connection to the stage; rear-projection preferred. (The performer must not throw a shadow on the screen.)
- min. 4 x 4 m free space on the stage (in front of the screen)
- LAN connection from FOH to stage.
- Stereo audio return from FOH to stage.

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- 3D sound system with subwoofer (at least 4 speakers, but a speaker hemisphere for ambisonics is preferred)
- two *wireless* instrument microphones (e.g. DPA d:vote Core 4099)

4 MEDIA LINKS

- Video (trailer with binaural sound): https://drive.google.com/open?id=1WnfG5Kmz0_Uzb6LTtQy2i-CvHr400D0c
- Video (live excerpt): https://drive.google.com/open?id=1gANshNjp42Rd_5oxPZSpCkdlmYorJQ81

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