Project Prompt

itm226, Ian MacDougald

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Introduction

To date, my musical work has focused on the development of personal tools in SuperCollider that reflect an alignment both with the aesthetics of Musique Concrète as well as with a mircosound-based approach to composition (see Roads 2001). Specifically, this latter area is of great interest to me not only for its conceptual strategies to the production of sounds (granular synthesis) but also for the way it seems to invite the appropriation of non-musical models as viable formal material, rendering otherwise inert masses of sound into intelligent swarms of internally choatic but ultimately organized material (see Blackwell and Young 2004). Moreover, an approach so alternative to classical theories of musical organization in turn presents an opportunity for new methods of interaction. For this project, I am proposing a system that encapsulates these concepts within an immersive, virtual environment. Specifically, the project will function as a Virtual Reality Music Instrument or, in other words, as a musical system driven by an interface only accessible through an XR head-mounted display (HMD).

Goals and Methodology

My goal for this project is to produce an interactive XR, generative interface for microsonic music system driven by Evolutionary Algorithms, causing musical particles, swarms, and whole events to spawn and mutate over time (see Dahlstedt 2009). In this way, the piece of music would explore its own potential based on the conditions of its environment. As such, the primary tools at play for this system will be SuperCollider, Unity, an Oculus Rift, and a Leap Motion sensor, in which SuperCollider processes and synthesizes audio, Unity and the Oculus manage the rendering and display of visual information, and the Leap Motion sensor mediates between these two domains, affecting the audio-visual environment, and, in turn, altering the evolution and history of the content of the piece. As a result, the ideal iteration of this system will allow for interaction with every level of the musical experience, as one's own hands instigate new sonic events and affect and mold musical form in real-time.

The realization of these goals will require the creation of a system that can support and integrate the practices of generative music with the techniques of XR development, and, in doing so, will offer a solution to the fundamental problem of procedural audio (see Collins 2009). To this end, this project proposes a network-based model in which two separate computers are dedicated to the functions of audio and visuals respectively. The motivations supporting the architecture of this system are threefold: first, by separating these domains, the system guarantees that ample resources are available for high-level performance; second, this strategy adds a scalable flexibility to the system in which multiple users can experience the virtual environment at once either in an interactive or observational capacity using, at the very least, a cheap single-board computer like a Raspberry Pi to synthesize the output of the generative music system; and third, as the research and distribution of high-performance non-tethered head-mounted displays (HMD) expands, such a system will become increasingly necessary, and, as a result, while the current system is proposed for a VR-based HMD, this model will allow for easy upgradeability following the emergence of new technologies, thus resisting sudden obsolescence despite dramatic developmental shifts in the XR market.

The technical components of this project can thusly be considered as those implementing the audio-visual generative system and those supporting the connection between audio processes and visual processes. On the utilities side, SuperCollider will communicate back-and-forth with Unity using the Open Sound Control protocol (OSC) and will be responsible for the delivery of the audio output from the system. Yet, just as interaction with the visual environment will yield sonic results, the opportunity to engage with the system from the opposite end seems both simple to implement and, thusly, too exciting to miss. In other words, the system as it is currently conceived allows for the possibility of leveraging the SuperCollider scripting language to live code the visual experience rendered in VR.

References

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