

Project Title: Music Composing in Virtual Reality

With the advent of immersive computer-based rendered technologies, virtual reality adds on numerous possibility in a variety of applications ranging from medical treatment to creative art. For music composition, most tools nowadays are restricted in a two-dimensional working space, either using music sheet, some notation software or using Digital Audio Workstation (DAW) on the plain computer screen. All of these methods require great amount of music theory knowledge for user to make their music, thus build significant barrier for mass public to create their own art. The goal of this project is to explore the interaction design and musical engagement in this virtual, three-dimensional environment where user with no musical background can produce great sound, just like drawing a picture in this empty space. The control of virtual musical instruments and real-time composing in this three-dimensional environment creates freedom for everyone to join in the music arena and enables endless sound creation.

After working with Professor Reid and Professor Dahl, I have a working beta version software where user can pick an instrument from Ableton library, and play chromatic scale by simply waving their VR controller (Video demonstration attached). The next step for this project is to increase multiple functions, where user can play music in different mode, different key, different scale, and start to perform great solo piece with the help of deep learning and composition algorithm. Since user can pick any kind of instrument, how this VR software approach to different sound type is worth studying. Moreover, since I am using Max for Live to connect Unity and Ableton, the max patch itself gives more possibility to create interesting sound filter, and eventually make improvisation, which is one of the most enjoyable but also most demanding forms of music performance, available for unskilled players.

The task is not easy, and with the suggestion of Professor Burtner, I was hoping to take more lesson in regard to music technology. I was hoping to attend different music technology workshops hosted by Center for Computer Research in Music and Acoustics (CCRMA) at Stanford University. I would love to seek for funding to cover my project, tuition expense and traveling cost. The benefit of this study experience is invaluable. I can learn about the most cutting edge technology in this field and get in touch with other talented musicians around the world, which could be a great inspiration for my project.

Project Timeline

Feb 22 - May 11: Working on my project with the help of Professor Dahl and Professor Reid

May 21- Jun 16 : Taking Lesson with Professor Burtner

Jun 21 - Aug 20: Taking Summer course at Stanford, and apply what I have learned in my project

Aug 22 - Dec 1: Polish my project and make it Open Source

Budget:

VR headset (Oculus rift) : \$399

Ableton 9 Standard + Max for Live : \$398

CCRMA Summer Course Tuition: \$2000 (\$500 each)

(Deep Learning for MIR I: How do Neural Networks Learn Music?: Irán Román, Kitty Shi

Deep Learning for MIR II: State-of-the-art Algorithms: Irán Román, Kitty Shi

Formalized Score Control: Using Python and Abjad in Music Composition: Trevor Baca, Josiah

Oberholtzer, Jeffrey Treviño

Algorithmic Composition with Max/MSP and Open Music: Davor Vincze, Andrew Watts)

Round Flight from Charlottesville to San Francisco: \$550

Sum: \$3347

Participation In the Arts

I have been heavily involved with the arts while at UVA. I am double majoring in Music and Computer Science and have been dedicated in music technology since my first year. I took MUSI 2350 (Technosonics: Digital Music), MUSI 4559(Sound Synthesis and Control), MUSI 4600 (Performance with Computers), MUSI 3390 (Intro to Music and Computer) and actively involved in the Mobile Interactive Computer Ensemble (MICE), where I performed my music piece (written in MAX/MSP) at ACC Smithsonian Creativity and Innovation events, UVA Bicentennial Celebration, and UVA Arts Grounds.

As a drummer, I have been taking private drum lessons with professor Jospe since my first year. I performed regularly in my first year and second year with my band at different events. We founded FIN band union, with the idea in mind that this organization will provide support to student-run bands on ground. I served as treasurer for two semesters.

I have been a member of the arts Scholars since my third year. I was able to take CASS 1010 in the fall of my third year. Unfortunately, my music class (MUSI 3390) conflicts with the seminar this semester. Despite that, I am engaged in Miller Arts Community via social media. I intend to take both seminars at my fourth year.