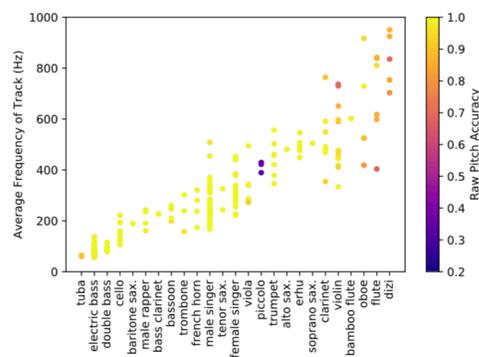
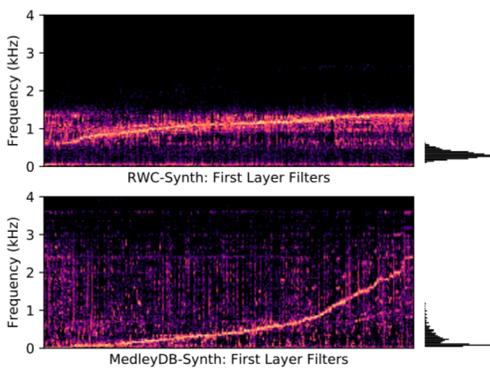


Kaiming Cheng
4th Year Arts Award
May 2018 - August 2018

Outcome Report: Music Composing in Virtual Reality

Last summer, I attended the summer workshop in the Center for Computer Research in Music and Acoustic center (CCRMA) at Stanford, as well as the New Interfaces for Musical Expression conference (NIME) at Virginia Tech. Over this rewarding summer, not only did I learn from other's work in music composing and instrument designing, but also from their valuable feedback on my virtual reality instrument. With the help of Miller Arts Scholar, I was able to purchase a latest VR headset and upgrade my instrument based on my learning experience last summer.

The first two workshop is on deep learning for music information retrieval. We explore the mathematical principles that make Neural Networks learn from our music data. I build several Neural Network architectures in Julia and in Python with tensor flow, including feedforward, recurrent and convolutional models. These models will be trained to solve Timbre detection, Genre Classification, and Natural language Processing tasks. The later workshop focus more on the audio visual design.



We engage in the investigation of historical works that culminate in a combination of site, sound, kinetic, light, moving imagery, or otherwise. It is very helpful to my personal project, since our relationships and perceptions with sound and space are incorporated into a multiplex system, bounded not only by the natural law of physics, but also our personal cognitive understanding of our sound world. With VR, we are now able to reform their visual and auditory systems into a created space. The rich data produced in virtual reality platforms offer a great opportunity to create an innovative sonic representation to the outside world. Admittedly, we do not have to be limited by the former boundaries, but that also means there are no requirements on how interaction and generated sound should relate. In other words, we can map any data generating process to any aspect of sound generation, which leads to the essential question: How should we best map the sound generating processes and the visual elements with the motion and gesture input from the users. After the workshop, I gave careful consideration to the spectromorphological consequences, so that a user's gesture means more than a correlated MIDI note but more of an energy-motion trajectory. You can find my latest music pieces here -> ([click here to view](#))

Expenditures

Item	Cost
CCRMA Summer Course Tuition	\$2000
Round Flight from Charlottesville to San Fransisco	\$550
VR headset (Oculus rift) :	\$399
Total	\$2949

Photos: CCRMA workshops



Photos: CCRMA workshops

