Residency Summary Report: CIRMMT Inter-Centre Research Exchange

Institutions: New York University (New York, New York) & McGill University (Montreal, Quebec)

Dates of Exchange: 7 October 2024 to 7 November 2024

Exchange Supervisors: Prof. Wieslaw Woszczyk (CIRMMT, McGill), Prof. Paul Geluso (NYU)

Exchange Participant: Kathleen "Ying-Ying" Zhang, PhD Candidate in Sound Recording McGill University

Exchange Objectives

I had three main objectives when proposing my Inter-Centre Research Exchange: to gather data as part of a perceptual study on musicians in variable acoustics, participate in the academic activities NYU Music Technology program, and attend the Fall 2024 Audio Engineering Society (AES) Convention at Javits Center. Below, I report on each of these objectives.

Research Study

The main purpose of my trip was to conduct human subjects research on the experience of musicians in acoustic environments. As a mixed methods study, the main focus of the research was to find if attributes Room Acoustics Quality Inventory (which was developed using acoustics experts) were also appropriate to discuss the experience of musicians in the act of performing in acoustic spaces, and to discuss what other possible attributes may be applicable in discussing their sense of perception. As my PhD focuses on musician response to acoustics, having access to an additional variable acoustics environment and subject pool has proved valuable for my ongoing research.

The study took place in 630 Paulson Center, a newly-launched mixed-use rehearsal, concert, and recording space. Through passive variable acoustics, the room can exhibit variable levels of reverb time and reverberance. With all acoustic banners lifted, its T30 time is an estimated 1.8s while with banners completely down it exhibits a time of 0.5s. It also exhibits some acoustically anomalous qualities in certain places, due to the shape and building materials used in the space. This made it a good site for the particular perceptual testing attributes that I wanted to test.

Prof. Paul Geluso supervised the methodology of this project in addition to my McGill supervisors, and was the primary investigator for my human subjects research in the United States. He helped gain ethical approval through NYU's Institutional Review Board

(IRB) process, as well as access to research spaces and equipment through the NYU Music Technology program. Additionally, Prof. Dafna Naphtali helped me pilot the experiment while giving valuable insight into the mind of an acoustics-minded performer, and how she would analyze the room from a musician-led perspective. Not only have her insights shaped my approach to this study in particular, they have also shaped the way I approach my thesis topic in general.

After ethical approval, I was able to gather 10+ hours of interview recordings from participants, who were largely students from the NYU population. We had a wide variety of instrument groups represented, including representatives from population groups who do not typically perform in acoustic spaces (singer/songwriters, rock bassists, etc). This has proved both extremely insightful to my PhD topic but has been tricky to navigating the analysis. I am currently organizing and analyzing the data gathered during my test and discussing my initial findings with my supervisors.

Academic Participation and Engagements

While at NYU, I was additionally able to participate in student societies, attend classes, and give talks. I attended two meetings of the Immersive Audio Interest Group where they discussed ongoing as well as past projects done by members, and was also able to meet a current Qualcomm researcher working on the Immersive Voice and Audio Services (IVAS) Codec. Prof. Juan Bello generously allowed me to sit in on his Doctoral Symposium classes, which were a two-part series on grant writing. And finally, Prof. Agniezska Roginska invited to me to guest lecture for her 3D Audio class. I gave a talk on Higher Order Ambisonics, and was able to discuss new research from McGill as well as play clips from recordings conducted in Montreal.

During weekends, was also able to visit other institutions and meet with researchers and practitioners there. This included visiting Prof. Jonas Braasch at Rensselaer Polytechnic Institute in order to visit CRAIVE Lab and EMPAC and speaking with Prof. Braxton Boren from American University about his ongoing virtual acoustics projects. I was also able to visit Duke University where I attended a student composer meeting and visit Prof. Justin Matthew at North Carolina State University where he discussed his process of creating a new Music Technology undergrad program that had just launched there.

Conference Attendance

The AES Fall 2024 Convention took place during the first week of my exchange. Representing McGill and CIRMMT, I was able to give two paper presentations on recent research, participate as a speaker in a workshop panel and moderate a papers session on room acoustics. The timing of the research exchange allowed me to not only participate in the conference, but the separate skill building sessions held before the main event as well.

Acknowledgments

The above opportunities would not have been possible without the funding and support of the CIRMMT Inter-Centre Research Exchange program. I would also like to thank my supervisor at NYU, Prof. Paul Geluso, and my McGill supervisor Prof. Wieslaw Woszczyk, for their continued support of my research. I hope to that my trip has, in some way, contributed to the future collaboration of CIRMMT and the institutions and organizations I was able to visit.