Project Report: Improving Personal Sound Zones Set Up Using Spherical Microphones for Seamless Adoption in Music and Museology Fields

Use of Funds:

The CIRMMT grant was primarily used to acquire a Zylia ambisonic microphone, essential for our measurement and calibration strategy. A portion of the funding was also allocated to support an intern, expected to work on the VST (Virtual Studio Technology) implementation of our method at Université de Sherbrooke. Unfortunately, the intern withdrew, and this aspect of the project could not be realized as initially planned.

Project Outcomes and Challenges:

We successfully completed the measurement phase using the Zylia microphone. The algorithmic component—from transfer function acquisition using ambisonic microphones to the implementation of Personal Sound Zones—was achieved through simulations and preliminary experiments. However, the absence of the intern delayed the VST plugin development, which would have allowed musicians and creative professionals to configure sound zones directly within a DAW (Digital Audio Workstation), thereby enhancing accessibility and usability.

In parallel, the Zylia microphone was used during the CIRMMT-sponsored "Journées Agora" for public demonstrations. These sessions introduced musicians, luthiers, and sound professionals to 3D audio recording technologies, encouraging interdisciplinary dialogue about their applications in performance, instrument design, and immersive sound archiving.

Next Steps:

We plan to resume the VST development phase at Sherbrooke in the coming months. Furthermore, we aim to submit a publication to the AES Journal/ Applied acoustics, detailing our experimental results on sound zone deployment based on transfer functions measured via ambisonic microphones. Finally, the creation of an artwork consisting of a mural comic strip, with its soundtrack and dialogue broadcast using sound zones, is still under discussion.

Benefits to CIRMMT and Its Community:

This project directly supports several core missions of CIRMMT. It fostered interdisciplinary research at the intersection of acoustics, audio engineering, and music practice. Through the use of innovative ambisonic measurement tools and algorithmic methods, it may contribute in the future to new approaches in the scientific study of music, media, and technology. By preparing for a DAW-integrated VST plugin and showcasing the technology during public demonstrations, we promoted the application of new technologies in both scientific and creative domains.

Conclusion:

Despite facing challenges due to the loss of a key intern, the project succeeded in delivering valuable measurements, advancing algorithmic development, and engaging diverse communities with cutting-edge audio technologies.