

# **Creating immersive experiences in documentary 3D music recordings based on the sound production in "Echo Serca" (comp. Pękala, Weber, Moździer) and "Premiere leçon de Tenebres a une voix" (comp. Couperin).**

## **Summary**

Virtual reality is a new medium that has the potential to be used in many different fields. In the case of music, one fascinating application of this technology is the ability to create recordings of events such as concerts or performances. Documentations of this kind can be played back later using virtual reality devices, in such a way that our senses of sight and hearing are completely absorbed in the reception of the signals, so we can feel as if we are almost reliving said events. This kind of experience that so thoroughly engulfs our perception is called immersive experience.

One of the most important stimuli capable of inducing an immersive experience is sound. In particular, the kind of sound that surrounds us and behaves naturally, that is, as we know and experience it in our daily lives. All the principles of acoustics and sound perception are important in building the impression of sound spatiality. The present work is an attempt to describe the most important issues in the field of spatial sound and immersion, based on works intended for reception through virtual reality goggles. Spatial sound is a complex phenomenon, comprising such components as perception, registration, processing, recording, playback, and evaluation. Each of these components contributes to the immersive experience, so it is essential to understand the big picture of this matter and how these various factors influence each other. The dissertation addresses the question how such sound should be reproduced to achieve the immersive effect. Chapters on spatial sound recording methods describe possible microphone techniques and strategies for encoding signals to create a spatial audio mix. Methods proposed are the object-based method, multichannel method, ambisonic method, and a method that allows sound reproduction and listening in six degrees of freedom (6DoF).

The methods and techniques described in this work have been tested in recording and in studio mixing scenarios. The two productions described in the dissertation differ in the nature of the music performed, and as a result, different methods were used for their realization, tailored appropriately for each event. In addition to issues relating exclusively to the sound, this work addresses also the relationship between spatial sound and video, and it includes a precise description of what technological environment allows the reproduction of this type of material in sufficiently high quality.