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The Spatial Sound Description Interchange Format: Principles, Specification, and Examples

Abstract: SpatDIF, the Spatial Sound Description Interchange Format, is an ongoing collaborative effort offering a semantic and syntactic specification for storing and transmitting spatial audio scene descriptions. The SpatDIF core is a lightweight minimal solution providing the most essential set of descriptors for spatial sound scenes. Additional descriptors are introduced as extensions, expanding the namespace and scope with respect to authoring, scene description, rendering, and reproduction of spatial sound. A general overview presents the principles informing the specification, as well as the structure and the terminology of the SpatDIF syntax. Two use cases exemplify SpatDIF's potential for pre-composed pieces as well as interactive installations, and several prototype implementations that have been developed show its real-life utility.

Introduction

SpatDIF, the Spatial Sound Description Interchange Format, presents a structured approach for working with spatial sound information, one that addresses the different tasks involved in creating and performing spatial sound.

A major problem when working on spatial sound is that the methods and the resulting works are often tied to a specific system or infrastructure—for example, with regards to the software used for composition and reproduction or the available speaker arrangement and the characteristics of the physical venue. The lack of flexibility this produces impedes the exchange of pieces between different venues, the mixing of different tools for authoring or performing the piece, and ultimately the preservation of the work in a sustainable form that is independent of the technology used to create it.

The goal of SpatDIF is to simplify and enhance the methods of working with spatial sound content. SpatDIF proposes a simple, minimal, and extensible

format as well as best-practice implementations for storing and transmitting spatial sound scene descriptions. It encourages portability and the exchange of compositions between venues with different surround-sound infrastructures. SpatDIF also fosters collaboration between artists such as composers, musicians, sound installation artists, and sound designers, as well as researchers in the fields of acoustics, musicology, sound engineering, and virtual reality.

SpatDIF strives to be human-readable, easily understood and unambiguous, platform- and implementation-independent, extensible, and free of license restrictions.

SpatDIF's applications are not limited to the sound-scene concept alone. With both its ability to communicate time-independent metadata and its extensibility with further types of data descriptors, the format is open to other related fields such as sound synthesis, compositional algorithms, and abstract spatial geometry.

SpatDIF is developed as a collaborative effort and has evolved over a number of years. The online community and all related information can be found at www.spatdif.org.