

TOWARDS AN INTERCHANGE FORMAT FOR SPATIAL AUDIO SCENES

Gary Kendall
Northwestern University
Evanston, US
soon SARC, Belfast

Nils Peters
McGill University,
CIRMMT
Montreal, Canada

Matthias Geier
Deutsche Telekom
Laboratories
Berlin, Germany

ABSTRACT

This extended abstract outlines a proposal for an ICMC panel discussion with the intention to set on the development of a file format to create, store and share spatial audio scenes across 2D/3D audio applications and concert venues. This discussion shall include composers, sonic artists, researchers and developers in order to make such a format widely acceptable.

Keywords: Panel Discussion, 3D Audio, Spatial Music, Scene Description, Spatial Perception, Standardization, Portability

1. INITIAL PROBLEM

Several spatialization algorithms and many software implementations exist to create spatialized soundfields. We found that many spatialization algorithms use a self-contained syntax and storage-format, wherein sequences of control messages (e.g. trajectories to move a sound in space) programmed for one application are incompatible with any other implementation.

Furthermore, as shown in Figure 1, more and more concert halls and research facilities are equipped with a large number of loudspeakers. Although these venues might provide a good environment for 3D audio applications, they often differ in terms of room size, their technical specifications and the applied audio rendering concept. The lack of a common format for controlling spatialization across different rendering platforms and venues complicates the portability of compositions and requires manual synchronization and conversion of control data – a time consuming affair. Incompatible data formats also prevent collaboration between researchers and institutions. Therefore we call for the collaborative development of a format to describe spatial audio information in a structured way to support real-time and non-real-time applications.

2. EXISTING SCENE DESCRIPTION FORMATS

Over the years several formats and frameworks were developed with the intention to allow for platform-independent playback and re-usability of scene elements, as there were among others:

- MPEG-4 Advanced AudioBIFF, [9]
- OpenAL, [3]
- X3D, ¹
- XML3DAUDIO, [7]
- Audio3D, [4]
- SSP, [2]

However, no format has established itself in the spatial audio community because these formats are primarily tailored to multimedia and gaming applications and do not necessarily consider the special requirements of spatial music performances in concert venues. Furthermore it is the authors opinion that artists were not sufficiently involved in the development of these formats.

Efforts have been made recently towards the outlined problem e.g. in [1] and [6], but discussion with the community is needed to cover all needs and to create a common format which everyone is willing to use.

3. HIGH-LEVEL SPATIAL DESCRIPTORS

In addition to low level information, high-level spatial descriptors are necessary in order to create a meaningful and interchangeable scene description. The authors of [5] and [8] created a vocabulary of spatial-perceptual attributes for describing the organization of reproduced sound sources.

4. ICMC PANEL DISCUSSION

4.1. Purpose

The ICMC is the oldest conference for computer music – an event with reputation where developers, musicians and composers exchange ideas. Through our research, we know that there are different groups, working on such format to describe audio scenes. To develop a well accepted format, we want to bring these groups together to share and enhance their ideas with the community.

4.2. Potential discussion-topics

- The challenge of porting spatial music from a studio into concert venues
- Hardware specifications
- Scaling of scenes

¹ <http://www.web3d.org/x3d/>

- Organization and handling of sources groups
- Necessary source parameters
- Requirements for deterministic/interactive scenes
- Differences between 2D and 3D scene description
- Authoring and storage in the same format?
- Integration into existing systems
- Synchronization to controllers and video devices

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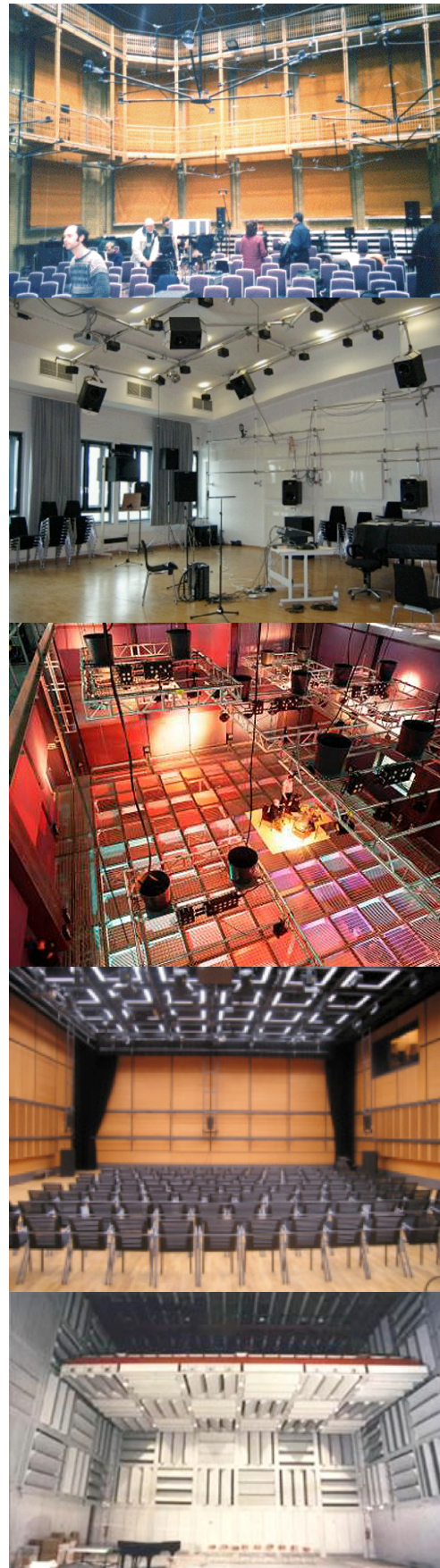


Figure 1. Several electroacoustic concert venues. from top to down: BEAST UK, IEM Austria, SARC Northern Ireland, ZKM Germany, IRCAM France