ambitools Documentation

Pierre Lecomte
pierre.lecomte@gadz.org

January 14, 2016

Contents

1 Introduction

This document is organized as follows :

1.1 Goals of ambitools

ambitools is a collection of tools for sound-field synthesis using Near-Field Compensated Higher Orders Ambisonics (NFC-HOA). For the rest of this document, the denomination Ambisonics will be used for simplicity.

ambitools is developped in the context of my PhD on sound field synthesis. The audio processing is coded in Faust (Functional AUdio Stream) which allows to produce efficent C++ code and exports in various DSP tools format : VST, standalone applications, lv2, etc. Thus, ambitools is multi-platform although conceived under Linux/Jack.

The goal of ambitools is mainly to produces several modules to encode, decode, transform sound sources or 3D recordings in a context of physical sound field synthesis.

The project is open-source under GPL licence. The Faust code is easily editable without beeing an C++ DSP engineer, so if a module should be adapted to a configuration, it'll be very easy to change a few lines in the code and produce quickly the required tool, using for example FaustLive.

Don't hesitate to contact me for any suggestions, requirements, critics.

1.2 Ambisonics

This section presents the basis of Ambisonics for 3D sound field synthesis. If you're familiar with Ambisonics you may skip this section.

2 Installing ambitools

To install ambitools, simply go on the github repository and

2.1 Depedencies

3 The different tools

3.1 Faust

3.1.1 hoa_encoder

3.1.2 hoa_decoder_*

3.1.3 hoa_panning_*

3.1.4 hoa_flipping

3.1.5 hoa_beamformer_to_mono

3.1.6 hoa_beamformer_to_hoa

3.2 Processing

3.2.1 Spherical_VU_Meter

3.3 Jconvolver

3.3.1 jconvolver_mic*

3.3.2 hrir_lebedev50

4 Examples

4.1 Flys flying around

4.2 Record trajectories with Ardour