Master Thesis

Ambisonics Warping for Speaker Separation and/or Interference Suppression

Description

The spatial distribution of a sound-field on the surface of a sphere can be warped around the sphere using transformation matrices in the spherical harmonic domain. In works by Pomberger and Zotter, it is discussed how this method can be used to widening or narrowing the sound-field around a certain spot. In this master thesis, we want to examine how this method can be used for speaker separation and/or interference suppression.

The work consists of
a) Getting familiar with Ambisonics, Ambisonics transformations
b) Implement a basic (offline) framework for generating Ambisonic signals, apply Ambisonics warping, rendering the transformed signals to loudspeaker or binaural signals.
c) Use warped signals for noise/interference reduction.

Related topics

- Microphone array processing
- Higher order Ambisonics
- Speech enhancement

Recommended prerequisites

- MATLAB programming skills.
- Solid math background (engineering level).
- Courses: Speech and Audio Signal Processing, Speech Enhancement, Statistical Signal Processing.

Supervisor

M.Sc. Adrian Herzog

Professor

Prof. Dr. ir. Emanuël Habets