

MOVE - Audio Technology Demo on ICA and Virtual Environment



AdiSys

AdiSys is dedicated to the development of digital signal processing technologies for audio applications. Our research area includes among other things motion-based head-related transfer functions (Motion-HRTF) and Independent Component Analysis.

What is HRTF / Motion-HRTF ?

The spectral filtering of a sound source before it reaches the ear drum that is caused primarily by the outer ear is termed the HRTF.

One of today's popular applications of HRTF spectral shaping is fixed 3D-positioning of virtual (surround) loudspeakers for home stereo systems. Other target applications are portable hi-fi sets, as well as car hi-fi. Furthermore, it is well known that non individualized HRTF's can be improved through customization, which is possible in the context of our technology.

Motion-HRTF uses time varying seamless 3D-positioning cues for virtual motion FX.

Motion-HRTF may be applied to single targets in a multi-source environment, e.g. for PC-games, but this is only one of many possible commercial applications. This is specially true if the DSP-performance required for a real-time implementation is not very high, as this is the case for our Motion-HRTF algorithms.

What is ICA ?

Roughly speaking ICA means blind separation of mixed signals aimed to achieve the output signals as independent as possible.

One application area of ICA is audio separation e.g. for conversion of stereo into multi-channel sound.

MOVE Technology Demo

The MOVE v3.2 technology demonstration performs audio effects from our real time suite in combination with a PC-based MP3 music player.

MOVE v3.2 technology demonstration includes 3D on the move, the 3D-sound equalizer, stereo channel separation into center + left / right channels, lead vocal formant modification and Xtended Stereo. Xtended Stereo performs instantaneous conversion of stereo sound into (virtual) multi-channel.

The user can **instantly** compare and experience the high quality virtual **environment / motion** and **separation cues** on **standard MP3** songs.

Features MOVE v3.2:

HQ Audio Effects

- Simple Loudness on/off switchable,
- seamless Digital Resampling,
- seamless Time Stretching,
- seamless Pitch Shifting (Sync Stretch/Resample).

Environmental Cues

- Seamless Reverberation medium & large room,
- seamless Widening.

3D-Parametric Equalizer

- Seamless Elevation cue,
- seamless Front-Back cue.

3D on the Move

- Motion-HRTF on/off switchable,
fb: front-back path
ar: moving around
- fixed slow motion pattern.

Customizable HRTF (only 1st dimension in v3.2)

Channel Separation

- Separation of stereo signals into center (e.g. lead vocals) and left/right channels,
- Voice Formation ("age") demo of center channel.

Xtended Stereo

- Separation of stereo signals into 5.1 channels,
- Separation of stereo signals into virtual multi-channel environment for Headsets.

PreSettings are available over a button menu.



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