Spatial Impulse Response Rendering demos v 0.1 Ville Pulkki, Juha Merimaa,

These multichannel sound samples are to demonstrate Spatial Impulse Response Rendering (SIRR), which is a method to compute multi-channel impulse responses for loudspeaker listening from measured room impulse responses. See our publications in AES conventions (AES116, AES118), and future JAES papers for details of the method.

There are three different sounds, a monophonic count in (one-two-one-two...) [sig1], a stereophonic mix of latin music made from Apple Garageband real instrument loops [sig2], and a short excerpt of anechoic classical orchestral music [sig3].

Measurements from five different halls have been SIRR-processed:

Arena: Gaylord entertainment center in Nashville, Texas, double response measured by Waves.

Hall: Snape Malltings hall in UK, double response measured by Waves

Bathroom: A quite large bathroom in Finland, a single response measured by us with custom intensity probe and a B&K omni mic

Theatre: Teatro Comunale di Ferrara, Italy, a single response measured by Angelo Farina

Cathedral: Bergamo Cathedral in Italy, a single response measured by Angelo Farina

The SIRR responses have been computed with our software for two different loudspeaker layouts, standard 5.0 in channel order LRLsRsC, and a 7.0 system, which expands 5.0 with additional two loudspeakers in back (Left back -150 degrees and Right back 150 degrees), channel order LRLsRsCLbRb. A multichannel SIRR response was computed for both channels of stereo sound material. If measurements from two adequate source directions to a single receiver position were available, they were used (Arena and Hall), and in other cases the SIRR response was rotated +-30 degrees to obtain two responses. This means that listening to this material corresponds to listening to stereo reproduction in the room where the response was measured. If you have possibility to listen to the 7.0 responses, please note how the envelopment of reverberation is preserved in back and side listening positions. In 5.0 system the envelopment is lost easily if either of the surround loudspeakers is too near.

There are 30 multichannel files, whose names imply their content. For example, the file name SIRRsig2ShowerLRLsRsCLbRb48.wav means that the latin music stereo signal have been convolved with SIRR response computed from shower room measurements for 7.0 loudspeaker setup in channel order (Left - Right - Left surround - Right surround - Center - Left back - Right back).

These responses are only for demonstration purposes. In all cases the measurements have not been meant to be used in convolving reverbs. However, you should be able to hear the characteristics of different acoustics quite well. Helsinki University of Technology (TKK) has licensed SIRR to Waves Inc., who have released a CD of responses rendered for 5.0 loudspeaker setup. The responses in the CD are not the same responses as have been used in this demonstration.

In http://www.acoustics.hut.fi/projects/poririrs/ there are SIRR responses and B-format responses available, which have been measured from a medium-sized concert hall.