AHMTools™

AHMTools™ is an extensive collection of utilities for HRTF and map visualization and post-processing, all accessible through a convenient GUI. The utilities include various AHM tools for comparing, equalizing, exporting data to Matlab™, frequency re-sampling, geometrical re-sampling, merging data sets, and HRTF map format conversion to many popular file formats.

HeadZap™ System Upgrades

96 kHz Sampling Rate
High-resolution time-domain sampling delivers the response detail required for cutting-edge psycho-acoustic research.

Multi-Loudspeakers
Multiple-loudspeakers deliver even quicker overall subject measurements, resulting in less subject fatigue and greater through-put. The reduced subject fatigue improves positioning and response accuracy and allows for denser grids. Multiple loudspeakers are a recommended upgrade for permanent installations.

Head-Tracking
HeadZap™ can monitor subject positioning and posture with real-time head-tracking. Head-tracking improves measurement positioning and allows the actual impulse response bearing to be saved with the dataset for post analysis.

Active Subject Position Targets
Active wall-markers provide position feedback to subjects to self-correct their posture and improve results. The active targeting system requires the use of head-tracking, and is recommended for permanent HeadZap™ installations.

Portable Version
An especially portable version of HeadZap™ may be bundled with AuSIM's RollingNugget™ localization server to provide true portability. The portable HeadZap™, which comes complete with compact airline cases, can be setup and operational in less than 30 minutes.

About AuSIM

AuSIM Inc. is a world-leading developer of audio technologies located in the heart of Silicon Valley, near Stanford University. In addition, the company maintains AuSIM Satellite Studios, a complete audio recording and production facility in Scotts Valley, California. The studios produce both original sound content and revolutionary AuSIM3D™ sound recordings.

AuSIM Inc. was founded in 1998 to provide positional 3D audio simulation solutions. To develop such solutions, AuSIM maintains expertise in the following areas: physics, wave mechanics, acoustic theory, linear systems, control systems, signal processing, and real-time system engineering. AuSIM's technical positions include integrated system designers, 3D simulation engineers, acoustic technologists, audio engineers, and software programmers. To inquire about current AuSIM opportunities, write us at jobs@ausim3d.com.

AuSIM invites inquiries about products, services, technology, and investment opportunities; simply send email to info@ausim3d.com or call (650) 32-AUSIM.

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HeadZap

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http://audiosimulation.com

AuSIM
Engineering Solutions

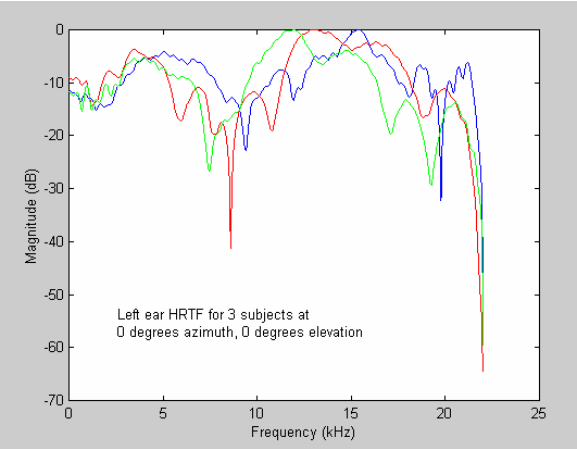
Audio Simulation for Mission-Critical Applications

AuSIM HeadZap™

The world's most convenient method and apparatus for measuring Head-Related-Transfer-Functions

Motivation

Simulation of 3D audio employs filters containing characteristics of the head, torso, and pinna. The accuracy of these filters, or Head-Related Transfer Functions (HRTF), directly affects the quality of the synthesized sound. Research shows that using HRTFs specific to the listener significantly improve localization precision.



Until recently, measuring individualized HRTFs was a costly and lengthy process that could only be performed in highly controlled acoustic environments, often requiring expensive custom software and hardware components.

Overview

HeadZap™, a commercially available acoustic measurement system designed to measure HRTFs, is an essential tool for hearing research, virtual auditory environment modeling, and 3D sound simulation. Capturing a complete map of acoustic measurements for a specific individual is fast and easy and can be performed in normal "live", untreated rooms.

Features

AuSIM designed HeadZap with a deep feature list to meet wide-ranging needs, providing researchers with advanced options and technicians with efficient procedures.

HeadZap's features include:

- Paired sequence test signals providing a higher Signal-to-Noise ratio (SNR)
- User-defined test signal and impulse response lengths
- 44.1kHz, 48kHz sampling rates
- User-defined measurement direction grid size and density
- Selectable map equalization
- Selectable bass compensation
- Selectable display equalization
- High-resolution grid "inserts"
- Selectable interpolation methods
- AuSIM Rendograph AHM auralization tool
- AuProbe™ audio system probe
- AHMTools™ utility suite

HeadZap™ stores measurements in an Acoustic Head Map (AHM) using 32-bit precision. AHMs can be directly loaded into any AuSIM3D powered system for immediate rendering of 3D sound.

Components

HeadZap™ extends any of AuSIM's flexible GoldSeries real-time audio simulation servers into a full audio measurement workstation.

Measurement system components include:

- Miniature blocked-meatus "in-ear" microphones, specially-matched
- Specially-designed, flat response loudspeaker (400Hz-20kHz)
- Specially-designed amplifier and tuned microphone pre-amp
- Loudspeaker positioning apparatus
- Adjustable subject stool
- Otoscope and ear-canal-sealing rings
- HeadZap, AuProbe, and AHMTools software
- Matlab computing environment

Usability

AuSIM built the graphical user interface of HeadZap™ on top of Matlab™, from The MathWorks Inc. The wizard-style user interface guides the operator through the measurement process. Plots generated instantaneously allow the user to monitor the data as measurements are taken. Intuitive controls provide the capability to review, re-measure, and automate measurements.

HeadZap™ can be set up in almost any office-like environment.

HRTF measurements are fast and subjects require minimal preparation. For example, the measurement of 168 HRTFs in a complete spherical grid consisting of 24 azimuth locations at 7 elevations takes less than 30 minutes with a one-speaker setup.

AuProbe™

AuProbe™ is a complete general-purpose audio measurement system with sample-accurate I/O for capturing acoustic characteristics of any audio system. AuProbe™ works well for all types of signal paths, including air, material transmission, and electrical. AuProbe™ supports up to 96 input and output channels and provides the synchronized play-and-record utility used by HeadZap™.