

142nd Audio Engineering Society International Convention 2017

Berlin, Germany
20 - 23 May 2017

Volume 1 of 2

ISBN: 978-1-5108-4352-3

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2017) by the Audio Engineering Society
All rights reserved.

Printed by Curran Associates, Inc. (2017)

For permission requests, please contact the Audio Engineering Society
at the address below.

Audio Engineering Society
International Headquarters
551 Fifth Ave., Suite 1225
New York, NY 10176
USA

Phone: +1 212 661 8528

www.aes.org

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

VOLUME 1

Perceptual Evaluation of Synthetic Early Binaural Room Impulse Responses Based on a Parametric Model	1
<i>P. Stade, J. Arend, C. Porschmann</i>	
Implementation and Evaluation of a Low-cost Head-tracker for Binaural Synthesis	11
<i>M. Romanov, P. Berghold, D. Rudrich, M. Zaunschirm, M. Frank, F. Zotter</i>	
Influence of Head Tracking on the Externalization of Auditory Events at Divergence between Synthesized and Listening Room Using a Binaural Headphone System	17
<i>S. Werner, G. Gotz, F. Klein</i>	
Laboratory Reproduction of Binaural Concert Hall Measurements Through Individual Headphone Equalization at the Eardrum	25
<i>D. Griesinger</i>	
Approaching Immersive 3D Audio Broadcast Streams of Live Performances	37
<i>G. Jacuzzi, S. Brazzola, J. Kares</i>	
Active Vibration Control of Breackup Modes in Loudspeaker Diaphragms	45
<i>W. Cardenas</i>	
An Acoustic Radiator with Integrated Cavity and Active Control of Surface Vibration	54
<i>A. Berkhoff, F. Tajdari</i>	
The Acoustic Design of Minimum Diffraction Coaxial Loudspeakers with Integrated Waveguides	59
<i>A. Makivirta, J. Vaisanen, I. Martikainen, T. Lund, Siamak Naghian</i>	
Root Cause Analysis of Rocking Modes in Nonlinear Domain	71
<i>A. Schwock, W. Cardenas, M. Cobianchi, W. Klippel</i>	
Nonlinearity of Ported Louspeaker Enclosures	79
<i>J. Backman</i>	
Efficiency Investigation of Subwoofer Driven Around Resonance Frequency	86
<i>T. Thydal, N. Iversen, A. Knott</i>	
An Analytical Approach for Optimizing the Curving of Line Source Arrays	94
<i>F. Straube, F. Schultz, D. Bonillo, S. Weinzierl</i>	
Analysis of the Subgrouping Practices of Professional Mix Engineers	107
<i>D. Ronan, H. Gunes, J. Reiss</i>	
Combining Preference Ratings with Sensory Profiling for the Comparison of Audio Reproduction Systems	120
<i>T. Walton, M. Evans, F. Melchior, D. Kirk</i>	
The Audience Effect on the Acoustics of Ancient Theatres in Modern Use	130
<i>G. Iannace, A. Trematerra</i>	
Evaluation of Training to Improve Auditory Memory Capabilities on a Mobile Device Based on a Serious Game Application	139
<i>H. Nagy, G. Wersenyi</i>	
Conversational Speech Quality in Noisy Environment	144
<i>M. Soloducha, A. Raake, S. Bleiholder, F. Kettler</i>	
Acoustic Room Modelling using a Spherical Camera for Reverberant Spatial Audio Objects	152
<i>H. Kim, R. Hughes, L. Remaggi, P. Jackson, A. Hilton, T. Cox, B. Shirley</i>	
Estimating the Diffuseness Level of the Acoustic Field - Reverberation Chamber Under Study	162
<i>B. Chojnacki, A. Pilch, T. Kamisinski, A. Flach</i>	
Environmental and Technical Problems in Acoustical Scaled Models	167
<i>A. Majchrzak, B. Chojnacki, K. Baruch, J. Rubacha</i>	
OpenAirLib: A JavaScript Library for the Acoustics of Spaces	173
<i>K. Brown, M. Paradis, D. Murphy</i>	
Measurement and Visualization of Sound Intensity Vector Distribution in Proximity of Acoustic Diffusers	180
<i>A. Kurowski, J. Kotus, B. Kostek</i>	
Comparison of Spatial Characteristics of Head-related Transfer Functions Between the Horizontal and Median Planes	186
<i>X. Zhong, B. Xie, G. Yu</i>	
An Experiment to Evaluate the Performance of a Parametric Model for the Individualization of the HRTF in the Median Plane	193
<i>P. Gutierrez-Parera, J. Lopez</i>	

The Influence of Symmetrical Human Ears on the Front-Back Confusion	201
<i>R. Bornhardt, J. Fels</i>	
Quantifying Consistency in Loudspeaker System Production	210
<i>A. Goldberg</i>	
Loudspeakers Performance Variance Due to Components and Assembly Process	221
<i>M. Bellini, A. Farina</i>	
Evaluation of Audio Test Methods and Measurements for End-of-Line Automotive Loudspeaker Quality Control	229
<i>S. Temme, V. Dobos</i>	
Determining Pronunciation Differences in English Allophones Utilizing Audio Signal Parameterization	239
<i>B. Kostek, M. Piotrowska, T. Ciszewski, A. Czyzewski</i>	
Mathematical Model of the Acoustic Signal Generated by the Combustion Engine	247
<i>M. Luczynski, S. Brachmanski</i>	
Whispered Speech Speaker Recognition. Listening Tests Versus Speaker Recognition System	255
<i>K. Goliasz, M. Luczynski</i>	
A Study on Audio Signal Processed by "Instant Mastering" Services	260
<i>M. Piotrowska, S. Piotrowski, B. Kostek</i>	
Augmented Reality to Improve Orchestra Conductor's Headphone Monitoring	268
<i>D. Soudoplatoff, A. Pras</i>	
Wave Field Synthesis Driving Functions for Large-Scale Sound Reinforcement Using Line Source Arrays	278
<i>F. Schultz, G. Firtha, P. Fiala, S. Spors</i>	
Position Dependence of Fractional Derivative Models for Loudspeaker Voice Coils with Lossy Inductance	292
<i>A. King, F. Agerkvist</i>	
Model for Evaluation of Power Consumption of Vented Box Loudspeakers	302
<i>F. Madsen, S. Thorsen, N. Iversen, A. Knott</i>	
Assessment of the Radiation Mode Method for in Situ Measurements of Loudspeaker Systems	312
<i>M. Sanlatii, L. Vindrola, C. Vasseur, P. Herzog, M. Melon, R. Guillermin, N. Poulain, J.-C. Le Roux</i>	
The Median-plane Summing Localization in Ambisonics Reproduction	322
<i>B. Xie, H. Mai, X. Zhong</i>	
Exploring the Perceptual Sweet Area in Ambisonics	331
<i>M. Frank, F. Zotter</i>	
Phantom Source Widening by Filtered Sound Objects	337
<i>F. Zotter, M. Frank</i>	
Ambisonic Spatial Blur	347
<i>T. Carpentier</i>	
Comparing Ambisonic Microphones – Part 2	354
<i>E. Bates, S. Dooney, M. Gorzel, H. O'Dwyer, L. Ferguson, F. Boland</i>	
Object-based Reverberation Encoding from First-order Ambisonic RIRs	364
<i>P. Coleman, A. Franck, D. Menzies, P. Jackson</i>	
Further Investigations on the Design of Radial Filters for the Driving Functions of Near-Field Compensated Higher-Order Ambisonics	374
<i>N. Hahn, S. Spors</i>	
Supply Voltage Scaling Technique of Triode Tube based on Harmonic Distortion Characteristics	385
<i>K. Takemoto, S. Oshimo, T. Hamasaki</i>	
Linear Phase Crosstalk Cancellation Filters	394
<i>A. Reymond, C. Faller, D. Weiss</i>	
PapeGaN FETs Drive Fidelity and Efficiency in Class-D Audio Amplifiers	404
<i>S. Colino, S. Taylor</i>	
Ultra Efficient Linear Amplifiers	414
<i>J. Angus</i>	
Evaluation of Audio Performance Over Product Life	424
<i>W. Klippel</i>	
Is it Harder to Perceive Coding Artefact in Foreign Language Items? – A Study with Mandarin Chinese and German Speaking Listeners	438
<i>N. Schinkel-Bielefeld, Z. Jiandong, Q. Yili, A. Leschanowsky, F. Shanshan</i>	
Parametric Joint Channel Coding of Immersive Audio	448
<i>H.-M. Lehtonen, H. Purnhagen, L. Villemoes, J. Klejsa, S. Gorlow</i>	

Quantitative Investigation Artificial Room Simulations Reproduced by Channel-based and Object-based Surround Sound Systems.	458
<i>B. Camilleri, J. Bergner, C. Sladeczek</i>	
Comparative Perceptual Evaluation Between Different Methods for Implementing Reverberation in a Binaural Context	467
<i>L. Picinali, A. Wallin, Y. Levitov, D. Poirier-Quinot</i>	
Data-driven Granular Sound Synthesis	474
<i>S. Siddiq</i>	
Parametric Synthesis of Crowd Noise in Virtual Acoustic Environments	483
<i>V. Grimaldi, C. Bohm, S. Weinzierl, H. Coler</i>	
Real Or Illusion? A Comparative Study of Captured Ambiance Vs. Artificial Reverberation in Immersive Audio Applications	491
<i>R. King, B. Leonard, W. Howie, J. Kelly</i>	
Investigating the Impact of a Music Stand on Stage Using Spatial Impulse Responses	499
<i>S. Gari, M. Kob</i>	
The Perceptual Effect of Vertical Interchannel Decorrelation on Vertical Image Spread at Different Azimuth Positions	506
<i>C. Gribben, H. Lee</i>	

VOLUME 2

Predictors for the Perception of “Wildness” and “Heaviness” in Distorted Guitar Timbre	516
<i>K. Tsumotoo, A. Marui, T. Kamekawa</i>	
An Investigation into the Relationship Between the Subjective Descriptor Aggressive and the Universal Audio 1176 FET Compressor	523
<i>A. Moore, J. Wakefield</i>	
Investigations Towards Plausible Blind Upmixing of Applause Signals	533
<i>A. Adami, L. Brand, J. Herre</i>	
Joint Parameter Optimization of Differentiated Discretization Schemes for Audio Circuits	543
<i>F. Germain, K. Werner</i>	
Virtual Analog Modeling of Dynamic Range Compression Systems	553
<i>F. Eichas, E. Gerat, U. Zolzer</i>	
Evaluation of Auditory Events with Projected Sound Sources Using Perceptual Attributes	563
<i>T. Wuhle, S. Merchel, M. Altinsoy</i>	
The Evaluation of the Effect of Sound Directionality in Horizontal Plane on Human Auditory Distance Perception in a Large Reverberant Room	573
<i>T. Afghah, A. Allen, P. Otto, A. Benjamin</i>	
Improvement of the Reporting Method for Closed-loop Human Localization Experiments	582
<i>F. Winter, H. Wierstorf, S. Spors</i>	
Investigations on Perceptual Phenomena of the Precedence Effect using a Bessel Sequence	590
<i>F. Wendt</i>	
Just Noticeable Difference in Apparent Source Width Depending on the Direction of a Single Reflection	599
<i>D. Johnson, H. Lee</i>	
Modeling Horizontal Audio-visual Coherence with the Psychometric Function	609
<i>H. Stenzel, P. Jackson, J. Francombe</i>	
How Important is Accurate Localisation in Reproduced Sound?	619
<i>R. Mason</i>	
Close Miking Empirical Practice Verification: A Source Separation Approach	629
<i>K. Drossos, S. Mimilakis, A. Floros, T. Virtanen, G. Schuller</i>	
Audio System Spatial Image Evaluation Via Binaural Feature Classification	638
<i>G. Kamaris, S. Karlos, S. Terpinas, D. Koutsaidis, J. Mourjopoulos</i>	
Long-term Average Spectrum in Popular Music and its Relation to the Level of the Percussion	648
<i>A. Elowsson, A. Friberg</i>	
Efficient Music Identification Approach Based on Local Spectrogram Image Descriptors	660
<i>M. Zanoni, S. Lusardi, P. Bestagini, A. Canclini, A. Sarti, S. Tubaro</i>	
MySofa: Design Your Personal HRTF	668
<i>C. Hoene, I. Mejia, A. Cacerovschi</i>	
Ecological Validity of Stereo UHJ Soundscape Reproduction	674
<i>F. Stevens, D. Murphy, S. Smith</i>	

Comparison of HRTFs from a Dummy-Head Equipped with Hair, Cap and Glasses in a Virtual Audio Listening Task Over Equalized Headphones	682
<i>G. Wersenyi, J. Repas</i>	
Filter Design of a Circular Loudspeaker Array Considering the Three-Dimensional Directivity Patterns Reproduced by Circular Harmonic Modes	689
<i>K. Sato, Y. Haneda</i>	
Wearable Sound Reproduction System Using Two End-Fire Arrays	699
<i>K. Imaizumi, Y. Haneda</i>	
Normalization Schemes in Ambisonic: Does it Matter?	707
<i>T. Carpentier</i>	
Perceptually Motivated Amplitude Panning (PMAP) for Accurate Phantom Image Localisation	717
<i>H. Lee</i>	
Full-Sphere Binaural Sound Source Localization by Maximum-Likelihood Estimation of Interaural Parameters	726
<i>B. Hammond, P. Jackson</i>	
Spatial Quality and User Preference of Headphone Based Multichannel Audio Rendering Systems for Video Games: A Pilot Study	736
<i>J. Rees-Jones, D. Murphy</i>	
Do In-Ear Monitors Protect Musicians' Hearing?	745
<i>A. Nykanen, M. Lofdahl, T. Johannesson, J. Berg</i>	
An Open-source Audio Renderer for 3D Audio with Hearing Loss and Hearing Aid Simulations	750
<i>M. Cuevas-Rodriguez, D. Gonzalez-Toledo, E. Rubia-Cuestas, C. Garre, L. Molina-Tamco, A. Reyes-Lecnona, D. Poirier-Quinot, L. Picinali</i>	
Sensory Profiling of High-end Loudspeakers Using Rapid Methods - Part 2: Projective Mapping with Expert and Naïve Assessors	758
<i>D. Giacalone, M. Nitkiewicz, S. Moulin, T. Bodason, J. Laugesen, S. Bech</i>	
Potential Audibility and Effects of Ultrasonic Surveillance Monitoring of PA and Life Safety Sound Systems	772
<i>P. Mapp</i>	
Pink Noise Formant Bandwidth Discrimination	780
<i>T. Rogala</i>	
The Influence of Program Material on Sound Quality Ratings of In-Ear Headphones	790
<i>S. Olive, T. Welti, O. Khonsaripour</i>	
Audio Quality Evaluation in MUSHRA Tests – Influences Between Loop Setting and a Listener's Ratings	802
<i>N. Schinkel-Bielefeld</i>	
Audio Time Stretching with Controllable Phase Coherence	812
<i>N. Juillerat</i>	
Modelling Nonlinearities on Musical Instruments by Means of Volterra Series	821
<i>L. Tronchin, V. Coli, F. Gionfalo</i>	
The Influence of Source Spectrum and Loudspeaker Azimuth on Vertical Amplitude Panning	830
<i>M. Mironovs, H. Lee</i>	
Efficient Natural Sample Calculation for Digital Pulse Width Modulation	837
<i>C. Wegner, R. Schwann, D. Ehrhardt</i>	
Construction of Lightweight Loudspeaker Enclosures	844
<i>H. Juul-Nyholm, J. Severinsen, H. Schneider, N. Mortensen, M. Andersen</i>	
LAMI: A Gesturally Controlled Three-dimensional Stage Leap (Motion-Based) Audio Mixing Interface	853
<i>J. Wakefield, C. Dewey, W. Gale</i>	
OSPW (Open Signal Processing Workstation) – Concept and Development of a Stand-alone Open Platform for Signal-processing in Av-networks	863
<i>H. Stenschke, T. Resch, P. Glaettli, R. Riedi, C. Fiechter</i>	
Facilitating Online International Student Collaborations Through Sound Design	872
<i>K. McAlpine, R. Steel</i>	
Far-field Noise Prediction for Open-air Events. Part 1: Background and Propagation Models	881
<i>M. Christner, J. Schaal, D. Zollitsch, E. Shabalina, D. Belcher</i>	
Noise Prediction Software for Open-Air Events Part 2: Experiences & Validation	886
<i>D. Belcher, M. Christner, E. Shabalina</i>	
Development and Evaluation of an Interface with Four-Finger Pitch Selection	891
<i>H. Coler, G. Treindl, H. Egermann, S. Weinzierl</i>	
Interactive Display of Microphone Polarity Patterns with Non-fixed Frequency Point	899
<i>J. Ziegler, H. Paukert, B. Runow</i>	

Optimization of Temporally Diffuse Impulses for Decorrelation of Multiple Discrete Loudspeakers	905
<i>J. Moore, A. Hill</i>	
Seamless Spatial Calibration of Multi-channel Sound Systems	915
<i>A. Peillot</i>	
Extraction of Interchannel Coherent Component from 3D Multichannel Audio	923
<i>Y. Hashimoto, H. Tanaka, A. Ando</i>	
Subjective Evaluation of Orchestral Music Recording Techniques for Three-Dimensional Audio	932
<i>W. Howie, R. King, D. Martin, F. Grond</i>	
Formal Usability Evaluation of Audio Track Widget Graphical Representation for Two-dimensional Stage Audio Mixing Interface	942
<i>C. Dewey, J. Wakefield</i>	
In-ear Vs. Loudspeaker Monitoring for Live Sound and the Effect on Audio Quality Attributes and Musical Performance	952
<i>J. Berg, T. Johannesson, M. Lofdahl, A. Nykanen</i>	
Using a Speech Codec to Suppress Howling in Public Address Systems	961
<i>D. Ditter, E. Berdahl</i>	
Usability and Effectiveness of Auditory Sensory Substitution Models for the Visually Impaired	969
<i>A. Csapo, S. Spagnol, M. Martinez, M. Bujacz, M. Janeczek, G. Ivanica, G. Wersenyi, A. Moldoveanu, R. Unnthorsson</i>	
Adaptive Audio Engine for EEG-Based Horror Game	979
<i>J. Craig</i>	
Real-time Reverb Reduction for Improved Automatic Speech Recognition in Far-field	991
<i>K. Adam, M. Przemyslaw, K. Lukasz, L. Piotr</i>	
Car Infotainment Capabilities Vs. Customers' Needs and Expectations	996
<i>B. Kukulski</i>	
Amplitude Panning Between Beamforming-controlled Direct and Reflected Sound	1002
<i>F. Zagala, J. Linke, F. Zotter, M. Frank</i>	
Sound Zones: On the Effect of Ambient Temperature Variations in Feed-Forward Systems	1009
<i>M. Olsen, M. Moller</i>	
Assessing the Influence of Loudspeaker Driver Nonlinear Distortion on Personal Sound Zones	1019
<i>X. Ma, P. Hegarty, J. Pedersen, L. Johansen, J. Larsen</i>	
Extending Temporal Feature Integration for Semantic Audio Analysis	1026
<i>L. Vrysis, N. Tsipas, C. Dimoulas, G. Papanikolaou</i>	
Author Index	