

AES New York 2023

155th Audio Engineering Society Convention

New York, New York, USA
25-27 October 2023

Editors:

**Areti Andreopoulou
Braxton Boren**

ISBN: 978-1-7138-9466-7

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© (2023) by the Audio Engineering Society
All rights reserved.

Printed with permission by Curran Associates, Inc. (2024)

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

Natural Ambiance Expansion Processing For An Automotive Environment	1
<i>Daekyoung Noh, Jules De Balasy</i>	
Application of matrix analysis and FEA for the modeling of horn drivers.....	10
<i>Alexander Voishvillo, Tommaso Nizzoli, Balazs Kakonyi</i>	
Application of ML-Based Time Series Forecasting to Audio Dynamic Range Compression	16
<i>Pascal Brunet, Yuan Li, Soohyun Kim</i>	
Design Choices in a Binaural Perceptual Model for Improved Objective Spatial Audio Quality Assessment.....	24
<i>Pablo Delgado, Jürgen Herre</i>	
On the Impact of Neglecting Accurate Sound-Speed Models on the Cylinder Measurement Method for Directivity Balloons	33
<i>Matteo Desantis</i>	
Generic Use Case Model for Networked ProAV Systems	41
<i>Henning Kaltheuner, Nicolas Sturmel</i>	
Knowledge Distillation-Based Personalized HRTF Estimation Toward Real World	49
<i>Geon Woo Lee, Hong Kook Kim, Chan Jun Chun</i>	
Comparison of synthesized Virtual Sound Environments with validated Hearing Aid experiments.....	53
<i>Umut Sayin Sarac</i>	
Reexamining Traditional Stereo Microphone Techniques with Continuously Variable Pattern Microphones: Tools and Methodologies.....	61
<i>Jules Ryckebusch</i>	
Emulating Vector Base Amplitude Panning Using Panningtable Synthesis	67
<i>Timothy Schmele, Niklas Reppel</i>	
Using SuperCollider with OSC Commands for Spatial Audio Control in a Multi-Speaker Setup	75
<i>Maham Riaz, Anna-Maria Christodoulou</i>	
Investigation of the influence of noise signal characteristics on the efficiency of the ANC system for causal and non-causal systems.....	80
<i>Mikhail Pakhomov, Seyeong Jang, Joowon Park, Donghwan Kim, Dongmin Yang, Sangjun Kim, Mikhail Gusev, Fedor Skripnikov, Ivan Tolokonnikov</i>	
Close and Distant Gunshot Recordings for Audio Forensic Analysis	87
<i>Rob Maher</i>	
In-Ear Headphones on Ear Canal Simulator vs Real Human Ear Geometries: Quantifying the Differences with Simulations	95
<i>Andri Bezzola</i>	
Comprehensive Objective Analysis of Digital to Analog Conversion in Consumer and Professional Applications.....	103
<i>Amir Majidimehr</i>	

Perceptually Motivated Bitrate Allocation for Object-Based Audio Using Opus Codec	113
<i>Toni Hirvonen, Carlos Tejeda-Ocampo, Ema Souza-Blanes, Sunil Bharitkar</i>	
Integrating Live Computer Tools into the Creation, Adaptation, and Performance of Japanese Noh Theatre.....	121
<i>Austin Oting Har</i>	
An Over-Ear Headphone Target Curve for Brüel & Kjær Head And Torso Simulator Type 5128 measurements	138
<i>Gabriele Ravizza, Julian Villegas, Christer P. Volk, Tore Stegenborg-Andersen</i>	
An Investigation of Supervised Learning in Music Mood Classification for Audio and MIDI.....	145
<i>Maham Riaz</i>	
Perceptual impression of room impulse responses simulated by CE-FDTD method.....	153
<i>Shota Okubo, Toshiharu Horiuchi</i>	
Machine Learning: Predicting Audio Quality for high SPL Smartphone Recordings	158
<i>Philippe Guelen, Dan Zhao, Pietro Terra Pizutti Dos Santos, Arthur Drouadene, Justin Bacle</i>	
Transient Detection Methods for Audio Coding.....	167
<i>Senyuan Fan, Emily Kuo, Sneha Shah, Marina Bosi</i>	
Using high-resolution directivity data of musical instruments for acoustic simulation and auralization	175
<i>Stefan Feistel, David Ackermann, Stefan Weinzierl</i>	
Implementation of Simultaneous Deconvolution on a Real-time Smartphone App	183
<i>Ashish Rawat, Sunil Bharitkar, Allan Devantier, Matthew McDuffee, Ritesh Banka</i>	
Transcending Boundaries: Unleashing Musical Expression through Immersive Sound Image and Reverberation Control System.....	191
<i>Hiromu Ohgi, Hideo Miyazaki, Sungyoung Kim, SiHyun Uhm</i>	
Towards Vibrotactile Transducer Characterization.....	198
<i>Ravindra Wijesiriwardana, Sarosh Khwaja, Stuart Mansbridge, Jackie Green</i>	
A Dialogue-Enhanced Companion System for Tracking Simultaneous Interactions in an Immersive Environment	207
<i>Albert Chang, Shannon Briggs, Sam Chabot, Jonas Braasch</i>	
Predicting binaural room impulse responses from running signals using a cepstrum-based auditory model and deep learning.....	215
<i>Jeramey Tyler, Mei Si, Jonas Braasch</i>	
Loudspeaker position identification using human speech directivity index	223
<i>Adrian Celestinos, Carren Zhongran Wang, Victor Manuel Chin Lopez</i>	
On-device high-band restoration for speech separation.....	231
<i>Jeongook Song, Byungjun Kang, Jiwon Kim, Hanbin Bae, Hoon-Young Cho</i>	
Bass Preamplifier Emulation with Conditional Recurrent Neural Network	236
<i>Tsung-Yi Lee, Yu-Ting Tsai</i>	
Spatial resolution of human hearing with different azimuths, elevations, and bandwidths of source signals.....	242
<i>Masayuki Nishiguchi, Yuuki Saito, Kanji Watanabe, Koji Abe</i>	

The fast measurement of loudspeaker responses for all azimuthal directions using the continuous measurement method with a turntable.....	248
<i>Kazuhiko Kawahara, Mizuki Iwata, Miyato Tachibana, Ryo Nakaie</i>	
Towards the Classification of Recording Devices	252
<i>Alexander Mader, Andrew Bayfield</i>	
Spatial auditory masking between source signals at different elevations on the median plane	259
<i>Hiroto Fujishiro, Masayuki Nishiguchi, Kanji Watanabe, Koji Abe</i>	
Comparison of various 3D mesh acquisition methods for head-related transfer functions simulation.....	265
<i>Chang Sun, Koki Takahashi, Zhenxiang Hong, Kan Okubo</i>	
Iterative metric-based waveguide optimisation	270
<i>Lewis MacDonald, Jack Ocleo-Brown, Mark Dodd, Jonathan Hargreaves</i>	
Quantitative Assessment of Acoustical Attributes and Listener Preferences in Binaural Renderers.....	278
<i>Rai Sato, Akira Takeuchi, Hwan Shim, Sungyoung Kim</i>	
Spatial Average Measurement Methods for Calibration of Immersive Sound in Small Rooms.....	286
<i>Charles Sprinkle</i>	
Dynamic Equalizers Application to Loudspeaker Systems	293
<i>Paolo Martignon, Mario Di Cola, Alberto Bianco, Ben Cabot</i>	
Analysis of the audio engineering society's research trend of the last four decades using the topic modeling of the AES publications	300
<i>Minsang Namgoong, Sungyoung Kim</i>	
Measurement Techniques for Dynamic Equalizers	306
<i>Paolo Martignon, Daniele Ponteggia, Mario Di Cola</i>	
Transformer-Based Virtual Engine Sound Generation Method.....	314
<i>Jaeyoung Lee, Dool Choi, Jongin Jung</i>	
High-Fidelity Noise Reduction with Differentiable Signal Processing	319
<i>Christian J. Steinmetz, Thomas Walther, Joshua D. Reiss</i>	
Implementation of and application scenarios for plausible immersive audio via headphones	329
<i>Karlheinz Brandenburg, Carmelo Fascella, Nils Merten, Renato Profeta, Ulrike Sloma, Thomas Thron, Franciska Wollwert</i>	
A New Method for Transient Distortion Detection	337
<i>Steve Temme, Rahul Shakya, Jayant Datta</i>	
Evaluation of binaural rendering quality for professional audio.....	344
<i>Simone Fontana, Paolo Martignon, Mario di Cola, Alessandro Arturi, Alberto Bianco, Angelo Farina</i>	
Advancing DEI in AES: A Pilot Analysis of AES Convention Participants Data	352
<i>Jiayue Cecilia Wu, Richa Namballa, Mary Mazurek, Teri Grossheim</i>	
Neural modeling and interpolation of binaural room impulse responses with head tracking	360
<i>Yue Qiao, Edgar Choueiri</i>	
Comparing Virtual Source Configurations for Pipe Organ Auralization	369
<i>Elliot K. Canfield-Dafilou, Brian F.G. Katz</i>	

Fatigue: What Can Sports Science Teach Us About Performance in Audio Production?	378
<i>Brandon Vaccaro</i>	
Repeated knockout tournaments for efficient screening of the top-ranking sample.....	386
<i>Petteri Hyvärinen, Nils Meyer-Kahlen</i>	
Validation of a Neural Network Clustering Model for Affective Response to Immersive Music	393
<i>Sungyoung Kim, Doyuen Ko, Will Howie</i>	
Limits of the Cochlear Bandpass.....	400
<i>Zachary I. Miller, Wesley A. Bulla, Nick W. Bilski</i>	
Adaptive Speech Interactions for Augmented Reality Applications: A Tutorial and Case Study	403
<i>Colby Leider, Annita Kuo, Haibin Huang, Johannes Levermann</i>	
Speaker Classification from vowel sound segments.....	410
<i>Andres Vargas, Johana M. Florez L., Pedro Vizcaya G.</i>	
Jazz Mapping: An Advanced Framework for Solo Analysis and Discovery in Jazz Music	419
<i>Antonia Petrogianni, Dimitrios Vassilakis, Iraklis A. Klampanos, Theodoros Giannakopoulos, Areti Andreopoulou</i>	
Excitation Stimuli For Simultaneous Deconvolution of Room Responses	424
<i>Sunil Bharitkar, Ema Souza Blanes, Pascal Brunet</i>	
A Practical Approach to the Use of Center Channel in Immersive Music Production	430
<i>Richard King, Marc Theriault, George Massenburg</i>	
Generation of highly realistic virtual sound field by modifying head-related transfer functions	437
<i>Kanji Watanabe, Masayuki Nishiguchi, Koji Abe</i>	
Master Bus Coloring with Microphone Preamplifiers.....	444
<i>Yongyi Zang, Jingyao You</i>	
The Optimization of Microphone Techniques for capturing Virtual Acoustic Environments	455
<i>Vlad Baran, Kathleen Ying-Ying Zhang, Carolina Rodriguez Escobar, Aybar Aydin, Richard King, Wieslaw Woszczyk</i>	
Reproducing Virtual Acoustic Environments in the Recording Studio: Part I.....	463
<i>Aybar Aydin, Kathleen Ying-Ying Zhang, Vlad Baran, Richard King, Wieslaw Woszczyk</i>	
Binaural renderers accuracy comparison: Part I	471
<i>Lisa LaFountaine, Raymond Plasse, Wesley Bulla</i>	
SVD-Domain Basis Vector Interpolation and Bidirectional Cascaded Long Term Prediction for Frame Loss Concealment in Higher Order Ambisonics Signals.....	477
<i>Mahmoud Namazi, Ahmed Elshafiy, Kenneth Rose</i>	
Diffusion-based Speech Enhancement Using Decorrelated Attention for Score Network	483
<i>Kang Ryeol Kim, Geon Woo Lee, Hong Kook Kim</i>	
Reproducing Virtual Acoustic Environments in the Recording Studio: Part 2	487
<i>Kathleen Zhang, Aybar Aydin, Vlad Baran, Jack Kelly, Richard King, Wieslaw Woszczyk</i>	
Data generation with device-modeling using Treble's hybrid cloud-based system.....	495
<i>Erin Driscoll, Matthias Cosnefroy, Haukur Hafsteinsson, Jón Stefánsson, Finnur Pind</i>	

Spatial Sound Stability Enhancement By Advanced User-Tracked Loudspeaker Rendering.....	502
<i>Juergen Herre, Christof Faller</i>	
Capturing audience film sound preferences	508
<i>Ahmed Gelby, Iain McGregor</i>	
AudioVMAF: Audio Quality Prediction with VMAF	521
<i>Arijit Biswas, Harald Mundt</i>	
Squared Chebyshev and Elliptic Crossovers	528
<i>Juan Sierra</i>	
Review and Analysis of the Dinaburg C2S™ Alignment.....	536
<i>Roger Shively</i>	
Perceptual Study Exploring Locked and Unlocked Head Rotation Panning in Jazz Fusion Reproduction Over Headphones.....	548
<i>Maximilien Hein, Paul Geluso</i>	
Binaural Localization Ability In Headphones Around A 360 Degree Azimuth Between Varying Acoustic Environments	556
<i>Jordan Hargreaves, Desiree Hulley, Paul Evans, Edward Hodge, Dr. Ben Shirley</i>	
Exploiting 55 nm Silicon Process To Improve Analog-to-Digital Converter Performance, Functionality and Power Consumption	568
<i>Michael Chandler-Page, Andy Howlett, Mohamed G. Mohamed, Dipankar Nag, David Singleton, Jon Wigner</i>	
Style Transfer for Non-differentiable Audio Effects.....	578
<i>Kieran Grant</i>	
Analysis of Musical Spectral Distortions as a Rating Mechanism for High-Fidelity Earplugs.....	588
<i>David A. Anderson</i>	
Dynamic Polar Patterns: Advancing Recordist Agency via Dual-Output Microphones.....	595
<i>Matt Barnes, Christoph Frank</i>	
Generative Machine Listener.....	605
<i>Guanxin Jiang, Lars Villemoes, Arijit Biswas</i>	
Detection of phase alignment and polarity in drum tracks	612
<i>Alek Weidman, John Sweeney, Wesley Bulla</i>	
Convolutional Transformer for Neural Speech Coding	619
<i>Hong-Goo Kang, W. Bastiaan Kleijn, Jan Skoglund, Michael Chinen</i>	
Improved Panning on Non-Equidistant Loudspeakers with Direct Sound Level Compensation	628
<i>Jan-Hendrik Hanschke, Daniel Arteaga, Giulio Cengarle, Joshua Lando, Mark R. P. Thomas, Alan Seefeldt</i>	
A Novel Digital Audio Network for Musical Instruments.....	638
<i>Miguel Chavez, Eric Cline, Paul Fernando</i>	
Vocal Affects Perceived from Spontaneous and Posed Speech	645
<i>Eunmi Oh, Jinsun Suhr</i>	

Perceptual Comparison of Dynamic Binaural Reproduction Methods for Head-Mounted Microphone Arrays..... <i>Benjamin Stahl, Stefan Riedel</i>	654
Investigation of the Impact of Spectral Cues from Torso Shadowing on Front-Back-Confusion and Perceived Differences along Cones of Confusion <i>Sascha Dick, Juergen Herre</i>	664
LoCOMo: A Low-Cost Open-Source Head Motorization Kit..... <i>Nils Poschadel, Stephan Preihs, Jürgen Peissig</i>	674
Sonifying time series via music generated with machine learning..... <i>Kevin Diaz, Julián Villegas</i>	684
Low-cost High-resolution Numerical Calculation of Head-related Transfer Function Using Finite-difference Time-domain Methods..... <i>Zhenxiang Hong, Tsubasa Kusano, Koki Takahashi, Chang Sun, Kan Okubo</i>	690
Improvement of sound reproducibility using open-ear-canal microphones for immersive audio applications..... <i>Koki Takahashi, Tsubasa Kusano, Zhenxiang Hong, Chang Sun, Kan Okubo</i>	701
Impact of mismatched room acoustic modeling on transaural reproduction with loudspeaker arrays	709
<i>Yazhou Li, Lin Wang, Josh Reiss</i>	
Microphone Comparison for Female R&B Vocal Recording	718
<i>Matthew Cheshire, Eilis Jones O'Shannessy</i>	
SynthAX: A Fast Modular Synthesizer in JAX	727
<i>Manuel Cherep, Nikhil Singh</i>	
Word based end-to-end real time neural audio effects for equalisation..... <i>Dharanipathi Rathna Kumar Balasubramaniam, Joseph Timoney</i>	735
Assessing Accessibility within the Recording Industry for Engineers and Producers with Vision Loss	743
<i>Lachi M</i>	

Author Index