60th AES International Conference 2016

Dereverberation and Reverberation of Audio, Music, and Speech

Leuven, Belgium
3 – 5 February 2016

Editors:

Stefan Goetze
Ann Spriest

PAPER SESSION 1

1-1 Blind Estimation of Room Acoustic Parameters Using Kernel Regression—Arthur Belthome,
Yves Grenier,1,2 Roland Badeau,3 Eric Hambert3
1 LTCI, CNRS, Télécom ParisTech, Université Paris-Saclay, Paris, France
2 Invoxia, Issy-les-Moulineaux, France
3 Aalborg University, Aalborg, Denmark

1-2 On the Relation between Data-Dependent Beamforming and Multichannel Linear Prediction for Dereverberation—
Thomas Dietzen,1,3 Ann Spriet,1 Wouter Tirry,3 Simon Doclo,1 Marc Moonen,1 Toon van Waterschoot2
1 KU Leuven, Leuven, Belgium
2 Imperial College London, London, UK
3 Fraunhofer Institute for Digital Media Technology IDMT, Oldenburg, Germany

1-3 A Study on the Preferred Level of Late Reverberation in Speech and Music—Joumi Paulus,1,2 Christian Uhle,1,2
Jürgen Herre,1,2 Marc Hoppe1
1 Fraunhofer Institute for Integrated Circuits, Erlangen, Germany
2 International Audio Laboratories Erlangen, Erlangen, Germany

PAPER SESSION 2

2-1 Finite Volume Time Domain simulations of Frequency-Dependent Boundary Conditions and Absorbing Layer—
Pierre Chobeau,1 Sebastian Prepelita,1 Jukka Saarelma,1 Jonathan Botts,2 Lauri Sariola2
1 Aalto University, Espoo, Finland
2 Rensselaer Polytechnic Institute, Troy, NY, USA

2-2 Multichannel Wiener Filter for Speech Dereverberation in Hearing Aids—Sensitivity to DoA Errors—
Adam Kuklasinski,1,2 Simon Doclo,3 Sören H. Jensen,1 Jesper Jensen,1,2
1 Oticon A/S, Smørum, Denmark
2 Aalborg University, Aalborg, Denmark
3 University of Oldenburg, Oldenburg, Germany

2-3 On Object-Based Audio with Reverberation—
Philip Coleman,1 Andreas Franck,1 Philip Jackson,3 Richard Hughes,1 Luca Remaggi1
1 University of Surrey, Guildford, Surrey, UK
2 University of Southampton, Southampton, Hampshire, UK
3 University of Salford, Salford, UK

2-4 Separation of Direct Sounds from Early Reflections Using the Entropy Rate Bound Minimization Algorithm—
Mathieu Bauté,1 Alexandre Guérin,1 Manuel Meloni2
1 Orange Labs, Cesson-Sévigné, France
2 LAUM, CNRS, Université du Maine, Le Mans, France

2-5 Large-Scale Auralized Sound Localization Experiment—
Enzo De Sena,1 Neofytos Kaplanis,1,2 Patrick A. Naglor,3 Toon van Waterschoot2
1 KU Leuven, Leuven, Belgium
2 Bang & Olufsen, Struer, Denmark
3 Aalborg University, Aalborg, Denmark

KEYNOTE PAPER 1

More Than 50 Years of Artificial Reverberation—
Vesa Välimäki, Aalto University, Helsinki, Finland

PAPER SESSION 3

3-1 Blind Room Acoustics Characterization Using Recurrent Neural Networks and Modulation Spectrum Dynamics—
João Felipe Santos,1,2 Tiago Henrique Falk1,2
1 Institut National de la Recherche Scientifique, Montreal, QC, Canada
2 Centre for Interdisciplinary Research in Music Media and Technology, Montreal, QC, Canada

3-2 Acoustic Environment Control: Implementation of a Reverberation Enhancement System—
Clement S. J. Doire,1 Mike Brookes,1 Patrick A. Naglor,1 Enzo De Sena,2
Toon van Waterschoot,2 Søren Holdt Jensen3
1 Imperial College London, UK
2 KU Leuven, Belgium
3 Aalborg University, Aalborg, Denmark

3-3 Loudness-Weighting of Reverberation Using Electronic Room Enhancement—
Winfried Lachenmayr, Mueller-BBM, Munich, Germany

3-4 Implementation and Assessment of Joint Source Separation and Dereverberation—
David Molflat, Joshua D. Reiss, Queen Mary University of London, London, UK

KEYNOTE PAPER 2

How do humans benefit from binaural listening when recognizing speech in noisy and reverberant conditions?—
Thomas Brand, University of Oldenburg, Germany

PAPER SESSION 4

4-1 Spectrally and Spatially Informed Noise Suppression Using Beamforming and Convolutional NMF—
Benjamin Cauich,1,4 Timo Gerkmann,2,4 Simon Doclo1,2,4 Patrick A. Naglor,3
Stefan Goetze1,3
1 Fraunhofer Institute for Digital Media Technology IDMT, Oldenburg, Germany
2 University of Oldenburg, Oldenburg, Germany
3 Imperial College London, London, UK
4 Cluster of Excellence Hearing4All, Oldenburg, Germany

4-2 The Perception of Hyper-Compression by Untrained Listeners—
Malachy Ronan, Nicholas Ward, Robert Sazdov
University of Limerick, Limerick, Ireland

PAPER SESSION 5

5-1 Incorporating the Noise Statistics in Acoustic Multichannel Equalization—
Ina Kodrasti, Simon Doclo, University of Oldenburg, Oldenburg, Germany

5-2 Analysis of Prediction Intervals for Non-Intrusive Estimation of Speech Clarity Index—
Pablo Peso Parada,1 Dushyant Sharma,1 Patrick A. Naglor,1
Toon van Waterschoot2
1 Nuance Communications Inc., Pound Lane, Marlow, UK
2 Imperial College London, UK

5-3 Finite Volume Modeling of Viscothermal Losses and Frequency-dependent Boundaries in Room Acoustics Simulations—
Stefán Bílbao, Brian Hamilton, University of Edinburgh, Edinburgh, UK

5-4 Dereverberation Using a Model for the Spatial Coherence of Decaying Reverberant Sound Fields in Rectangular Rooms—
Sam Nees, Andreas Schwarz, Walter Kellermann, Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany
### PAPER SESSION 6

**6-1 Robust Estimation of Reverberation Time Using Polynomial Roots**—Jan J. Kelly, Francis M. Boland, 
1. Google, Inc.
2. Trinity College, Dublin, Ireland

**6-2 Blind Adaptive SIMO Acoustic System Identification Using a Locally Optimal Step-Size**—Mathieu Hu, Dushyant Sharma, Simon Doclo, Mike Brookes, Patrick A. Naylor
1. Imperial College London, UK
2. Nuance Communications Inc., Marlow, UK
3. University of Oldenburg, Oldenburg, Germany

**6-3 A Method for Perceptual Assessment of Automotive Audio Systems and Cabin Acoustics**—Neofytos Kaplanis, Søren Bech, Sakari Tervo, Jukka Päätyn, Tapio Lokki, Toon van Waterschoot, Søren Holdt Jensen
1. Bang & Olufsen, Denmark
2. Aalto University, Espoo, Finland
3. Aalborg University, Aalborg, Denmark

### PAPER SESSION 7

**7-1 Blind Dereverberation of Speech Using Complex Adaptive Kurtosis Maximization in the Subband Domain**—Elias Nemer, DTS, Calabasas, CA, USA

**7-2 Non-Monotonic Impact of Occupancy Level on Reverberation Indicators: Case of a Public Confined Eating Establishment**—Yosra Mzah, Seddik Maarfi, Raja Ghazi, Meriem Jaidane
1. Ecole Nationale d’Ingénieurs de Tunis, Tunis, Tunisia
2. Telnet Innovation Labs, Ariana, Tunisia

**7-3 Room Acoustic System Identification Using Orthonormal Basis Function Models**—Giacomo Vairetti, Enzo De Sena, Michael Catrysse, Søren Holdt Jensen, Marc Moonen, Toon van Waterschoot
1. KU Leuven, Leuven, Belgium
2. Televic N.V., Izegem, Belgium
3. Aalborg University, Aalborg, Denmark
4. KU Leuven, Geel, Belgium

### PAPER SESSION 8

**8-1 On Determining Optimal Reverberation Parameters for Late Residual Echo Suppression**—Naveen Kumar Desiraju, Simon Doclo, Markus Buck, Timo Gerkmann, Tobias Wolff
1. Nuance Communications Deutschland GmbH, Ulm, Germany
2. University of Oldenburg, Oldenburg, Germany

**8-2 Sound Field Control in a Reverberant Room Using the Finite Difference Time Domain Method**—Niccolo Antonello, Enzo De Sena, Marc Moonen, Patrick A. Naylor, Toon van Waterschoot
1. KU Leuven, Leuven, Belgium
2. Imperial College London, UK
3. KU Leuven, Geel, Belgium

### PAPER SESSION 9

**9-1 A General Framework for Multichannel Speech Dereverberation Exploiting Sparsity**—Ante Jukic, Toon van Waterschoot, Timo Gerkmann, Simon Doclo
1. University of Oldenburg, Oldenburg, Germany
2. KU Leuven, Belgium

**9-2 Automatic Control of a Digital Reverberation Effect Using Hybrid Models**—Emmanouil Theofanis Chourdakis, Joshua D. Reiss, Queen Mary University of London, London, UK