WASPAA'03 Technical Program

Sunday, October 19, 2003

REGISTRATION   4:00PM-6:00PM

DINNER   6:00PM-7:20PM

KEYNOTE ADDRESS   7:20PM-8:20PM

Monday, October 20, 2003

BREAKFAST   7:00PM-7:55PM

OPENING REMARKS   7:55PM-8:00PM

SESSION A: ANALYSIS / SYNTHESIS - FILTER DESIGN   8:00AM-9:00AM

8:00am   **A Fixed-Cost Variable-Length Auralization Filter Model Utilizing the Precedence Effect**
            Huseyin Hacihabiboglu, *Queen's University Belfast, UK*
8:20am   **Frequency-Warped Burgs Method for AR-Modeling**
            Kari Roth and Ismo Kauppinen, *University of Turku, Finland*
            Paulo A. A. Esquef and Vesa Välimäki, *Helsinki University of Technology, Espoo, Finland*
8:40am   **Efficient Pole-Zero Modeling of Resonant Systems Using Complex Warping and Kautz Filter Techniques**
            Tuomas Paatero, *Helsinki University of Technology, Finland*

SESSION B: SOURCE SEPARATION AND SYSTEM IDENTIFICATION   9:00AM-10:20AM

9:00am   **Multi-Channel Source Separation by Beamforming Trained With Factorial HMMs**
            Manuel J. Reyes-Gomez and Daniel P. W. Ellis, *Columbia University, New York, USA*
            Bhiksha Raj, *Mitsubishi Electric Research Laboratories*
9:20am   **Blind Identification of Hammerstein Nonlinear Distortion Models**
            Guillaume Picard, *Institut National de lAudiovisuel, Bry-sur-Marne, France*
            Olivier Cappé, *Centre National de la Recherche Scientifique, Paris, France*
9:40am   **A New Fast-Converging Method for Blind Source Separation of Speech Signals in Acoustic Environments**
            Kamran Rahbar and James P. Reilly, *McMaster University, Hamilton, Ontario, Canada*

10:00am   **Separation of Harmonic Instruments With Overlapping Partials in Multi-Channel Mixtures**
Harald Viste, *Swiss Federal Institute of Technology, Lausanne, Switzerland*
Gianpaolo Evangelista, *University of Naples Federico II, Italy*

COFFEE BREAK   10:20PM-10:40PM

SESSION C: ARRAYS, BEAMFORMERS, AND ACTIVE NOISE CANCELLATION   10:40AM-12:20AM

10:40am   **Acoustic Echo Cancellation With Post-Filtering in Subband**
Xiaojian Lu and Benoît Champagne, *McGill University, Montréal, Canada*
11:00am   **Frequency-Domain GSC Beamforming with Enhanced Robustness Against Mistracking**
Zhaorong Hou and Ying Jia, *Intel China Research Center, Beijing, China*
Minerva Yeung, *Intel China Software Labs, Shanghai, China*
11:20am   **Design of a Microphone Array for Headsets**
Søren Laugesen, *Oticon Research Centre, Eriksholm, Denmark*
Karsten Bo Rasmussen and Torben Christiansen, *Oticon, Denmark*
11:40am   **Subband Generalized Sidelobe Canceller - a Constrained Region Approach**
Siow Yong Low and Sven Nordholm, *WA Telecomms. Research Institute, Crawley, Australia*
Nedelko Grbić, *Blekinge Institute of Technology, Ronneby, Sweden*
12:00pm   **Residual Noise in the Aggregate Beamformer**
David I. Havelock, *National Research Council, Ottawa, Ontario, Canada*

LUNCH / AFTERNOON BREAK   12:20PM-2:00PM

SESSION D: POSTER SESSION I - ICASSP '03 PAPERS   2:00PM-4:00PM

D-01   **Sub-Channel Below the Perceptual Threshold in Audio**
Heping Ding, *National Research Council, Ottawa, Ontario, Canada*
D-02   **A Missing Feature Approach to Instrument Identification in Polyphonic Music**
Jana Eggink and Guy J. Brown, *University of Sheffield, Sheffield, UK*
D-03   **On Psychoacoustic Noise Shaping for Audio Requantization**
Dreten De Koning and Werner Verhelst, *Vrije Universiteit Brussel, Brussels, Belgium*
D-04   **Structural Analysis of Musical Signals Via Pattern Matching**
Wei Chai, *MIT Media Laboratory, Cambridge, MA, USA*
D-05   **Application of Pitch Tracking to South Indian Classical Music**
Arvindh Krishnaswamy, *Stanford University, Stanford, CA, USA*
D-06   **Phase-Based Note Onset Detection for Music Signals**
Juan Pablo Bello and Mark Sandler, *University of London, London, UK*
D-07   **A Chorus-Section Detecting Method for Musical Audio Signals**
Masataka Goto, *Japan Science and Technology Corporation & National Institute of Advanced Industrial Science and Technology, Japan*
D-08   **Fine Grain Scalable Perceptual and Lossless Audio Coding Based On IntMDCT**
Ralf Geiger, Gerald Schuller and Thomas Sporer, *Fraunhofer AEMT, Ilmenau, Germany*
Jürgen Herre, *Fraunhofer IIS-A, Erlangen, Germany*
D-09   **Audio-Based Context Awareness Acoustic Modeling and Perceptual Evaluation**
Antti Eronen, Juha Tuomi and Anssi Klapuri, *Tampere University of Technology, Tampere, Finland*
Seppo Fagerlund, Timo Sorsa, Gaëtan Lorho and Jyri Huopaniemi, *Nokia Research Center, Finland*
D-10   **A Perceptually Balanced Loss Function for Short-Time Spectral Amplitude Estimation**
Patrick J. Wolfe and Simon J. Godsill, *University of Cambridge, Cambridge, UK*
D-11   **Sound Texture Modelling With Linear Prediction in Both Time and Frequency Domains**
Marios Athineos and Daniel P.W. Ellis, *Columbia University, New York, USA*

SESSION E: VIRTUAL ACOUSTICS - MULTICHANNEL TECHNIQUES 4:00PM-5:20PM

4:00pm **Perceptually-Based Processing of Directional Room Responses for Multichannel Loudspeaker Reproduction**
Ville Pulkki, *Helsinki University of Technology, Finland*
Juha Merimaa, *Helsinki University of Technology, Finland and Ruhr-Universität Bochum, Bochum, Germany*

4:20pm **Frequency-Domain Source Identification and Manipulation in Stereo Mixes for Enhancement, Suppression and Re-Panning Applications**
Carlos Avendano, *Creative Advanced Technology Center, Scotts Valley, CA, USA*

4:40pm **Loudspeaker Localization Using B-Format Recordings**
Banu Gunel, *Queens University, Belfast, UK*

5:00pm **A Comparison Between Multi-Channel Audio Equalization Filters Using Warping**
Sunil Bharitkar and Chris Kyriakakis, *University of Southern California, Los Angeles, CA, USA*

SESSION F: VIRTUAL ACOUSTICS - SYSTEMS 5:20PM-6:00PM

5:20pm **An Integrated Real-Time System for Immersive Audio Applications**
H. Teutsch, S. Spors, W. Herbordt, W. Kellermann and R. Rabenstein, *University of Erlangen-Nuremberg, Erlangen, Germany*

5:40pm **Implementation of Real-Time Partitioned Convolution on a DSP Board**
E. Armelloni, C. Giottoli, and A. Farina, *University of Parma, Parma, Italy*

DINNER 6:00PM-7:20PM

SESSION G: PERCEPTION AND AUDITORY MODELING 7:20PM-8:20PM

7:20pm **Using DSP-Based Parametric Physical Synthesis Models to Study Human Sound Perception**
Perry R. Cook, *Princeton University, Princeton, NJ, USA*
Stephen Lakatos, *Washington State University, Vancouver, WA, USA*

7:40pm **Neural Representation of Source Direction in Reverberant Space**
Barbara Shinn-Cunningham, Kosuke Kawakyu, *Boston University, Boston, MA, USA*

8:00pm **How Similar Do Songs Sound? Towards Modeling Human Perception of Musical Similarity**
Jürgen Herre, Eric Allamanche and Christian Ertel, *Fraunhofer Institute for Integrated Circuits, Erlangen, Germany*

SESSION H: MUSICAL SIGNAL PROCESSING - BEAT AND TEMPO TRACKING 8:20PM-9:20PM

8:20pm **Beat Estimation On the Beat**
Kristoffer Jensen and Tue Haste Andersen, *University of Copenhagen, Copenhagen, Denmark*

8:40pm **Beat Tracking With Particle Filtering Algorithms**
Stephen Hainsworth, *Cambridge University, Cambridge, UK*
Malcolm Macleod, *QinetiQ, Malvern, UK*

9:00pm **Musical Tempo Estimation Using Noise Subspace Projections**
Miguel Alonso, Roland Badeau, Bertrand David, and Gaël Richard, *Ecole Nationale Supérieure des Télécommunications, Paris, France*

Tuesday, October 21, 2003

BREAKFAST   7:00PM-7:55PM

OPENING REMARKS   7:55PM-8:00PM

SESSION I: ANALYSIS / SYNTHESIS: FILTERBANK DESIGN   8:00AM-9:00AM

8:00am   **Frequency Response Masking Approach for Designing Filter Banks With Rational Sampling Factors**
Ching-Shun Lin and Chris Kyriakakis, *University of Southern California, Los Angeles, California, USA*

8:20am   **A Gabor Regression Scheme for Audio Signal Analysis**
Patrick J. Wolfe and Simon J. Godsill, *Cambridge University, Cambridge, UK*

8:40am   **Sparsifying Subband Decompositions**
Mike Davies, *Queen Mary University of London, UK*
Laurent Daudet, *Université Paris 6, France*

SESSION J: SPEECH, SINGING, AND VOCAL TRACT MODELING   9:00AM-10:20AM

9:00am   **Auditory Signal Processing as a Basis for Speaker Recognition**
T.F. Quatieri, N. Malyska and D.E. Sturim, *MIT Lincoln Laboratory, Lexington, MA, USA*

9:20am   **Separation of Excitation Source and Vocal Tract Transfer Function Via an MVDR Analysis of Speech**
Alfiero Santarelli, Maurizio Omologo, and Luca Armani, *ITC-irst, Provo, Italy*

9:40am   **Digital Waveguide Mesh Modeling of the Vocal Tract Acoustics**
Jack Mullen, David M. Howard, and Damian T. Murphy, *University of York, Heslington, York, UK*

10:00am   **A Framework for Parametric Singing Voice Analysis/Synthesis**
Youngmoo E. Kim, *MIT Media Lab, Cambridge, MA, USA*

COFFEE BREAK   10:20PM-10:40PM

SESSION K: MUSIC SIGNAL PROCESSING - SEGMENTATION,
CLASSIFICATION, AND MUSIC INFORMATION RETRIEVAL   10:40AM-12:20AM

10:40am   **Summarizing Popular Music Via Structural Similarity Analysis**
Matthew Cooper and Jonathan Foote, *FX Palo Alto Laboratory, Palo Alto, CA, USA*

11:00am   **Audio Segmentation By Feature-Space Clustering Using Linear Discriminant Analysis and Dynamic Programming**
Michael M. Goodwin and Jean Laroche, *Creative Advanced Technology Center, Scotts Valley, CA, USA*

11:20am   **Semantic Rank Reduction of Music Audio**
Brian Whitman, *MIT Media Lab, Cambridge, MA, USA*

11:40am   **Coding of Sung Queries for Music Information Retrieval**
Norman H. Adams, Mark A. Bartsch, and Gregory H. Wakefield, *University of Michigan, Ann Arbor, MI, USA*

12:00pm   **Factors in Automatic Musical Genre Classification of Audio Signals**
Tao Li, *University of Rochester, Rochester, NY, USA*
George Tzanetakis, *Carnegie Mellon University, Pittsburgh, PA, USA*

LUNCH / AFTERNOON BREAK   12:20PM-2:00PM

SESSION L: POSTER SESSION II - ICASSP '03 PAPERS   2:00PM-4:00PM

L-01   **Experimental Comparison of Particle Filtering Algorithms for Acoustic Source Localization in a Reverberant Room**
        Eric A. Lehmann and Robert C. Williamson, *The Australian National University, Canberra, Australia*
        Darren B. Ward, *Imperial College London, UK*

L-02   **On the Importance of Exact Synchronization for Distributed Audio Signal Processing**
        Rainer Lienhart, Igor Kozintsev and Minerva Yeung, *Intel Corporation, Santa Clara, CA, USA*
        Stefan Wehr, *University Erlangen-Nürnberg, Erlangen, Germany*

L-03   **Adaptive Esprit Algorithm Based On the Past Subspace Tracker**
        Roland Badeau, Gaël Richard and Bertrand David, *Ecole Nationale Supérieure des Télécommunications, Paris, France*

L-04   **The Plenacoustic Function, Sampling and Reconstruction**
        Thibaut Ajdler and Martin Vetterli, *Swiss Federal Institute of Technology, Lausanne, Switzerland*
        Martin Vetterli, *University of California, Berkeley, CA, USA*

L-05   **Fast Convolutive Blind Speech Separation Via Subband Adaptation**
        François Duplessis-Beaulieu and Benoît Champagne, *McGill University, Montréal, Canada*

L-06   **Acoustic Beamforming Exploiting Directionality of Human Speech Sources**
        Terence Betlehem and Robert C. Williamson, *Australian National University, Canberra, Australia*

L-07   **Onset-Based Segregation of Stop Consonants**
        Guoning Hu and DeLiang Wang, *Ohio State University, Columbus, USA*

L-08   **Multi-Microphone Residual Echo Estimation**
        Markus Kallinger and Karl-Dirk Kammeyer, *University of Bremen, Bremen, Germany*
        Jörg Bitzer, *Houpert Digital Audio, Bremen, Germany*

L-09   **Toward Intelligent Sensors Reliability for Time Delay Based Direction of Arrival Estimates**
        Tuomo Pirinen, Pasi Pertilä and Ari Visa, *Tampere University of Technology, Tampere, Finland*

L-10   **A Coherent Multiple Frequency Estimator and Its Applications in Synthesis-Analysis Audio Watermarking**
        Yi-Wen Liu and Julius O. Smith, *Stanford University, Stanford, CA, USA*

L-11   **Scalable Non-Square Blind Source Separation in the Presence of Noise**
        Radu Balan, Justinian Rosca and Scott Rickard, *Siemens Corporate Research, Princeton, NJ, USA*

SESSION M: VIRUTAL ACOUSTICS - BINAURAL AUDIO AND HRTF PROCESSING   4:00PM-5:20PM

4:00pm   **The Effect of Microphone Placement on Localization Accuracy With Electronic Pass-Through Earplugs**
        Douglas S. Brungart, Cynthia S. Eades and Brian D. Simpson, *Air Force Research Laboratory, WPAFB, OH, USA*
        Alex J. Kordik, *Syntronics, Inc., WPAFB, OH, USA*

4:20pm   **Binaural Positioning System for Wearable Augmented Reality Audio**
        Miikka Tikander, Aki Härmä and Matti Karjalainen, *Helsinki University of Technology, Finland*

4:40pm   **HRTF Personalization Using Anthropometric Measurements**
        Dmitry N. Zotkin, Jane Hwang, Ramani Duraiswami and Larry S. Davis, *University of Maryland, College Park, MD, USA*

5:00pm   **Analysis of DC Effects on HRTFs Measured with Golay Codes: DC Blocking Golay Codes**
        Corey I. Cheng, *Dolby Laboratories, San Francisco, CA, USA*
        Gregory H. Wakefield, *University of Michigan, Ann Arbor, MI, USA*

OPEN-MIC SESSION   5:20PM-6:00PM

DINNER   6:00PM-7:20PM

SESSION N: RESYNTHESIS AND CROSS-SYNTHESIS   7:20PM-8:20PM

7:20pm   **Rejection Phenomena in Inter-Signal Voice Transplantations**
           Werner Verhelst and Henk Brouckxon, *Vrije Universiteit Brussel, Brussels, Belgium*
7:40pm   **Discrimination of Sustained Musical Instrument Sounds Resynthesized With Randomly Altered Harmonic Amplitudes**
           Andrew B. Horner, *Hong Kong University of Science and Technology, Kowloon, Hong Kong*
           James W. Beauchamp, *University of Illinois at Urbana-Champaign, Urbana, IL, USA*
8:00pm   **Time-Scale Modification of Music Using a Subband Approach Based on the Bark Scale**
           David Dorran, *Dublin Institute of Technology, Dublin, Ireland*
           Robert Lawlor, *National University of Ireland, Maynooth, Ireland*

SESSION O: MUSIC SIGNAL PROCESSING - MUSIC TRANSCRIPTION   8:20PM-9:20PM

8:20pm   **Non-Negative Matrix Factorization for Polyphonic Music Transcription**
           Paris Smaragdis, *Mitsubishi Electric Research Lab, Cambridge, MA, USA*
           Judith C. Brown, *Wellesley College, Wellesley, MA, USA*
8:40pm   **Generative Model Based Polyphonic Music Transcription**
           Ali Taylan Cemgil and Bert Kappen, *University of Nijmegen, The Netherlands*
           David Barber, *Edinburgh University, UK*
9:00pm   **Polyphonic Audio Matching and Alignment for Music Retrieval**
           Ning Hu, Roger B. Dannenberg and George Tzanetakis, *Carnegie Mellon University, Pittsburgh, PA, USA*

Wednesday, October 22, 2003

BREAKFAST   7:00PM-7:55PM

OPENING REMARKS   7:55PM-8:00PM

SESSION P: ANALYSIS / SYNTHESIS: SINUSOIDAL AND NOISE MODELING   8:00AM-10:20AM

8:00am   **An Iterative Filterbank Approach for Extracting Sinusoidal Parameters From Quasi-Harmonic Sounds**
           Harvey D. Thornburg and Randal J. Leistikow, *Stanford University, Stanford, CA, USA*
8:20am   **Comparing the Order of a Polynomial Phase Model for the Synthesis of Quasi-Harmonic Audio Signals**
           Laurent Girin, *Université Stendhal, Grenoble, France*
           Sylvain Marchand, *Université Bordeaux 1, Talence, France*
           Joseph di Martino, *Université H. Poincaré, Vandœuvre, France*
           Axel Röbel and Geoffroy Peeters, *IRCAM, Paris, France*

8:40am   **Towards a Better Balance in Sinusoidal-Plus-Stochastic Representation**

> Nicolle H. van Schijndel and Mireia Gómez, *Philips Research Laboratories, Eindhoven, The Netherlands*
>
> Richard Heusdens, *Delft University of Technology, Delft, The Netherlands*

9:00am   **Analysis Method to Approximate the Spectral Density of Noises**

> Pierre Hanna and Myriam Desainte-Catherine, *Université de Bordeaux 1, Talence Cedex, France*

SESSION Q: AUDIO CODING   9:20AM-10:20AM

9:20am   **A Comparison of Differential Schemes for Low-Rate Sinusoidal Audio Coding**

> Jesper Jensen and Richard Heusdens, *Delft University of Technology, Delft, The Netherlands*

9:40am   **Distributed Coding for Wireless Audio Sensors**

> Abhik Majumdar and Kannan Ramchandran, *University of California, Berkeley, CA, USA*
>
> Igor Kozintsev, *Intel Corporation, Santa Clara, CA, USA*

10:00am   **Individualization in Spatial-Audio Coding**

> Craig Jin, André van Schaik, Virginia Best, and Simon Carlile, *University of Sydney, Sydney, Australia*

COFFEE BREAK   10:20PM-10:40PM

SESSION R: PHYSICAL MODELING   10:40AM-12:20AM

10:40am   **Lie Analysis of the Webster Horn Equation with Application to Audio Object Recognition**

> Tania M. Barrett, Ian S. Burnett and Jason Lukasiak, *University of Wollongong, Wollongong, Australia*

11:00am   **A Multirate Approach to Physical Modeling Synthesis Using the Functional Transformation Method**

> Lutz Trautmann, *University of Erlangen-Nuremberg, Erlangen, Germany and Helsinki University of Technology, Finland*
>
> Vesa Välimäki, *Helsinki University of Technology, Finland*

11:20am   **Mixed Physical Modeling: DWG + FDTD + WDF**

> Matti Karjalainen, *Helsinki University of Technology, Finland*

11:40am   **Discrete-Time Simulation of Air-Flow Cut-Off in Pressure-Controlled Valves**

> Tamara Smyth, Jonathan Abel and Julius Smith, *Stanford University, Stanford, CA, USA*

12:00pm   **Methods for Simulating String Collisions with Rigid Spatial Obstacles**

> Arvindh Krishnaswamy and Julius O. Smith, *Stanford University, Stanford, CA, USA*

LUNCH / CHECK OUT BY 2:00PM   12:20PM-2:00PM