



Workshop "Computational Audition"

Date: Oct. 24, 2011 – Oct. 26, 2011

Location: HWK - Institute for Advanced Study (<http://www.h-w-k.de>, Northern Germany)

Format: Workshop with about 50 attendants, 12 invited speakers

Funding: Coordinated research project "The active auditory system" (SFB/TRR31) and centre for hearing research Oldenburg/Hanover

Chairs: V. Hohmann, J. Anemüller, S. van de Par, G. Klump, B. Kollmeier, A. Kral

Scientific committee: J. McDermott, M. Sahani

Website: <http://medi.uni-oldenburg.de/54662.html>

Objectives:

As a follow-up to the workshop held in 2010 at the UCL Gatsby computational neuroscience unit, this workshop further promotes and facilitates interaction between researchers in Psychoacoustics, Auditory Physiology and Machine Audition to stimulate joint efforts towards a better understanding of acoustic information processing in challenging conditions characterized by noise and reverberation. We believe that a breakthrough in the understanding of human Auditory Scene Analysis (ASA) and Computational Auditory Scene Analysis (CASA) can only be expected by multidisciplinary collaboration.

Topics:

- Physiological and psychological basis of Auditory Scene Analysis (ASA)
- Models of ASA: Computational Auditory Scene Analysis (CASA)
- Perceptual aspects of automatic Speech Recognition (ASR)
- Machine learning approaches to CASA
- Music information retrieval
- Models of speech (e.g., as used in Speech Synthesis)
- Language modeling

Confirmed speakers:

- T. Andringa, Sensory Cognition Group, University of Groningen, NL
- J. Barker, Speech and Hearing Research Group, University of Sheffield, UK
- S. Denham, University of Plymouth, UK
- M. Heckmann, Honda Research Institute Europe, D
- N. Lesica, UCL Ear Institute, UK
- R. Meddis, Hearing Research Laboratory, Essex University, UK
- B. Shinn-Cunningham, Auditory Neuroscience Lab, Boston University, USA
- P. Smaragdis, University of Illinois, USA
- C. Stecker, Dept. of Speech and Hearing Sciences, University Washington, USA
- D. Tollin, Dept. of Physiology and Biophysics, Colorado, USA
- R. Turner, Computational and Biological Learning, Cambridge University, UK
- E. Vincent, INRIA Rennes, F

Programme

Monday, October 24, 2011

Session 1: Chair *Maneesh Sahani*

- 10:00 – 10:30 Welcome (plus tea and coffee)
- 10:30 – 11:15 *B. Shinn-Cunningham* - Segregating and selecting objects from auditory scenes
- 11:15 – 12:00 *M. Heckmann* - Hierarchical spectro-temporal speech features
- 12:00 – 13:30 Lunch

Session 2: Chair *Andrej Kral*

- 13:30 – 14:15 *S. Denham* - Auditory scene analysis: a competition between auditory proto-objects?
- 14:15 – 15:00 *C. Stecker* - Temporal weighting of auditory spatial cues
- 15:00 – 15:30 Coffee break

Session 3: Chair *Birger Kollmeier*

- 15:30 – 16:15 *J. Barker* - Probabilistic models of auditory scene analysis for robust speech recognition
- 16:15 – 17:00 *P. Smaragdis* - "Exemplary" cocktail-party listening
- 17:00 – 18:00 Discussion
- 18:30 Welcome Dinner

Tuesday, October 25, 2011

Session 4: Chair *Georg Klump*

- 10:00 – 10:45 *D. Tollin* - Neural sensitivity to interaural level differences determines virtual acoustic space minimum audible angles for single neurons in the lateral superior olive
- 10:45 – 11:15 Coffee break
- 11:15 – 12:00 *E. Vincent* - A general flexible probabilistic framework for audio source separation
- 12:00 – 13:30 Lunch

Session 5: Chair Josh McDermott

- 13:30 – 14:15 *N. Lesica* - The resolution and complexity of the neural code for speech
- 14:15 – 15:00 *R. Turner* - Decomposing signals into a sum of amplitude and frequency modulated sinusoids using probabilistic inference
- 15:00 – 15:30 Coffee break

Session 6: Chair Jörn Anemüller

- 15:30 – 17:30 Poster session
- 17:30 – 18:00 Discussion
- 18:30 Dinner

Wednesday, October 26, 2011

Session 7: Chair Steven van de Par

- 10:00 – 10:45 *T. Andringa* - Pleasurable and annoying sounds and their impact on quality of life
- 10:45 – 11:30 *R. Meddis* - A computer model of the benefits of auditory efferent feedback
- 11:30 – 12:00 Coffee Break

Session 8: Chair Volker Hohmann

- 12:00 – 13:00 Discussion
- 13:00 – 14:00 Lunch
- 14:00 End of workshop