Abbie Kressner

Abigail Anne Kressner
Postdoctoral Researcher
Hearing Systems Group
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Education

2011-2015 Ph.D. · Electrical and Computer Engineering · Georgia Institute of Technology

Thesis: Structure in time-frequency binary masking
Advisor: Dr. Christopher J. Rozell

2009-2011 M.S. · Electrical and Computer Engineering · Georgia Institute of Technology

Thesis: Auditory models for evaluating algorithms
Advisor: Dr. Christopher J. Rozell

2008 Audiology · Vanderbilt University

2004-2007 B.S. · Biomedical Engineering · Washington University in St. Louis

Research support

2015-2017 Postdoctoral grant from Det Frie Forskningsråd (DFF; Danish Council for Independent Research)

2014-2015 National Science Foundation (NSF) Graduate Research Opportunities Worldwide (GROW)

2010-2015 National Science Foundation (NSF) Graduate Research Fellowship Program (GRFP)

2010-2013 National Defense Science & Engineering Graduate (NDSEG) Fellowship

Awards

2014 International Hearing Aid Conference (IHCON) Scholarship

2014 Chih Foundation Research Award

2009-2013 President's Fellowship · Georgia Institute of Technology

2011 ISAAR and GN Foundation Young Scientist Conference Scholarship

2010 21st Annual SAIC Student Paper Competition · First place

2004-2007 Jeffrey & Nancy Balter Biomedical Engineering Scholar · Washington University in St. Louis

2004-2005 Society of Women Engineers Scholar

Experience

Postdoctoral Researcher · Technical University of Denmark · Copenhagen, Denmark · 10/2015 to present

- Investigating cochlear implant speech coding errors

Visiting Scholar · National Acoustic Laboratories · Sydney, Australia · 6/2014 to 2/2015

- Investigated the influence of binary time-frequency gain manipulation errors in cochlear implant recipients

Consultant · United Sciences, LLC · Atlanta, Georgia, USA · 6/2013 to 3/2014

- Advised in the areas of acoustics and signal processing for new product development

Research Intern · Widex A/S · Vaerloese, Denmark · 1/2008 to 7/2008

- Investigated the influence of earmold venting on hearing aid feedback to facilitate better vent placement

Research Intern · Knowles Electronics, LLC · Itasca, Illinois, USA · 5/2007 to 8/2007

- Investigated the use of two directional microphones for sound source separation in the ear canal

Research Intern · AuSIM, Inc · Palo Alto, California, USA · 5/2006 to 8/2006

- Aided in the design of a field communication system that maintains 3D spatial relationships among users

Professional activities

2014-present	Reviewer for IEEE Transactions on Audio, Speech, and Language Processing
2013-2014	Member of American Auditory Society
2010-2014	Member of Institute of Electrical and Electronics Engineers (IEEE) and IEEE Signal Processing Society
2010-2012	Board member of Revive Atlanta Initiative, Inc.

Teaching activities

Course development · Georgia Institute of Technology · 5/2013 to 6/2014

- Development of signal processing laboratory assignment based on psychoacoustic masking

Teacher's assistant · Washington University in St. Louis · 8/2007 to 12/2007

- Department of Biomedical Engineering · Quantitative Physiology

Tutor · Washington University in St. Louis · 8/2005 to 5/2007

- Advanced Engineering Mathematics, Calculus, Differential Equations, and Engineering & Scientific Computing

Student supervision

Rasmus Malik Thaarup Hegh and Kristine Juhl · 2016

- Bachelor student project: *Analysis of estimated binary mask errors*

Technical Audiology and Experimental Hearing Science · 2016

- Masters student project: *Perceptual evaluation of noise reduction algorithm errors*

Publications

Journal publications

A.A. Kressner, T. May, and C.J. Rozell. Outcome measures based on classification performance fail to predict the intelligibility of binary-masked speech. Journal of the Acoustical Society of America, under review.

A.A. Kressner, A. Westermann, J.M. Buchholz, and C.J. Rozell. Cochlear implant speech intelligibility outcomes with structured and unstructured binary mask errors. Journal of the Acoustical Society of America, 139(2):800-810, February 2016. [paper]

A.A. Kressner and C.J. Rozell. Structure in time-frequency binary masking errors and its impact on speech intelligibility. Journal of the Acoustical Society of America, 137(4):2025-2035, April 2015. [paper, code]

A.A. Kressner, D.V. Anderson, and C.J. Rozell. Evaluating the generalization of the Hearing Aid Speech Quality Index (HASQI). IEEE Transactions in Audio, Speech and Language Processing, 21(2):407-415, February 2013. [paper, code]

Conference publications

A.A. Kressner and C.J. Rozell. Speech understanding in noise provided by a simulated cochlear implant processor based on matching pursuit. In Proceedings of the IEEE Workshop on Applications of Signal Processing to Audio and Acoustics (WASPAA), New Paltz, NY, October 2013. [paper]

A.A. Kressner, D.V. Anderson, and C.J. Rozell. Causal binary mask estimation for speech enhancement using sparsity constraints. In Proceedings of Meetings on Acoustics (POMA), Montreal, Canada, June 2013. [paper]

A.A. Kressner, D.V. Anderson, and C.J. Rozell. A novel binary mask estimator based on sparse approximation. In Proceedings of the IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Vancouver, Canada, May 2013. [paper]

A.A. Kressner, D.V. Anderson, and C.J. Rozell. Robustness of the Hearing Aid Speech Quality Index (HASQI). In Proceedings of the IEEE Workshop on Applications of Signal Processing to Audio and Acoustics (WASPAA), New Paltz, NY, October 2011. [paper]

A. Charles, A.A. Kressner, and C.J. Rozell. A Causal Locally Competitive Algorithm for the Sparse Decomposition of Audio Signals. In Proceedings of the IEEE Digital Signal Processing (DSP) Workshop, Sedona, AZ, January 2011. [paper]

Conference abstracts

A.A. Kressner and C.J. Rozell. The influence of structure in binary mask estimation error on speech intelligibility. In IHCON 2014 International Hearing Aid Research Conference, Lake Tahoe, CA, August 2014.

A.A. Kressner and C.J. Rozell. Speech separation using Matching Pursuit for time-frequency masking. In Signal Processing with Adaptive Sparse Structured Representations (SPARS) Workshop, Lausanne, Switzerland, July 2013.

A.A. Kressner, A.S. Charles, and C.J. Rozell. Causal Locally Competitive Algorithm for the sparse decomposition of audio signals. In IEEE Women's Workshop on Communications and Signal Processing, Banff, Canada, July 2012.

A.A. Kressner, D.V. Anderson, and C.J. Rozell. Computational auditory models validate the intelligibility benefit of efficient filters. In International Symposium on Auditory and Audiological Research (ISAAR) 2011, Nyborg, Denmark, August 2011.

A.A. Kressner, C.J. Rozell, and D.V. Anderson. Predicting speech quality using a computational auditory model. In IHCON 2010 International Hearing Aid Research Conference, Lake Tahoe, CA, August 2010.

M.J. Jensen, M.P. Linkenkaer, and A.A. Kressner. Using FEM to estimate the influence of pinna when calculating hearing aid relevant transfer functions. In IHCON 2008 International Hearing Aid Research Conference, Lake Tahoe, CA, August 2008.

Other reports

A.A. Kressner. Structure in time-frequency binary masking. PhD thesis. Georgia Institute of Technology, Atlanta, GA, May 2015.

A.A. Kressner. Auditory models for evaluating algorithms. MS thesis. Georgia Institute of Technology, Atlanta, GA, August 2011. [thesis]