

# Abbie Kressner

Abigail Anne Kressner  
Postdoctoral Researcher  
Hearing Systems Group  
Technical University of Denmark  
aakress@elektro.dtu.dk  
<http://cv.abbiekressner.com>

## Education

- |           |                                                                                                                                                                               |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2011-2015 | Ph.D. • Electrical and Computer Engineering • Georgia Institute of Technology<br><br>Thesis: Structure in time-frequency binary masking<br>Advisor: Dr. Christopher J. Rozell |
| 2009-2011 | M.S. • Electrical and Computer Engineering • Georgia Institute of Technology<br><br>Thesis: Auditory models for evaluating algorithms<br>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

2016-present    Reviewer for Journal of the Acoustical Society of America Express Letters

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 Høegh 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*, 139(6):3033-3036, June 2016. [paper]
- 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

- T. Bentsen, T. May, A.A. Kressner, and T. Dau. Comparing the influence of spectro-temporal integration in computational speech segregation. In *Proceedings of Interspeech*, San Francisco, California, September 2016.
- 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, New York, 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, New York, 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, Arizona, January 2011. [paper]

## Conference abstracts

- A.A. Kressner, A. Westermann, J.M. Buchholz, and C.J. Rozell. Speech coding errors in cochlear implants and their impact on speech intelligibility in noise. In *IHCON 2016 International Hearing Aid Research Conference*, Lake Tahoe, California, August 2016.
- 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, California, 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, California, 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, California, August 2008.

## Other reports

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

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