

Joshua Simeon Stohl, Ph.D.
Research Engineer, MED-EL Corporation
2511 Old Cornwallis Rd. Ste 100, Durham, NC 27713
919-314-3027
josh.stohl@medel.com

Adjunct Assistant Professor of Electrical and Computer Engineering
Duke University, Durham, NC 27708

EDUCATION

Duke University, Durham, NC

Ph.D. in Electrical and Computer Engineering

March 2009

Thesis: "Investigating the Perceptual Effects of Multi-rate Stimulation in Cochlear Implants and the Development of a Tuned Multi-rate Sound Processing Strategy"

Duke University, Durham, NC

M.S. in Electrical and Computer Engineering

July 2006

Thesis: "Using Variable Stimulation Rates to Encode More Information in Cochlear Implants"

University of North Texas, Denton, TX

B.S. in Engineering Technology

May 2004

Area of Concentration: Electronics

Minor: Music

Summa Cum Laude

RESEARCH INTERESTS

Psychophysics and psychoacoustics, with emphasis on pitch perception in electric hearing, and development and implementation of cochlear implant sound processing strategies

RESEARCH EXPERIENCE

MED-EL Corporation, Durham, NC

Research Engineer

Our primary research goal is the remediation of hearing loss with an emphasis on speech processor algorithm development for cochlear implants. One area of our research includes manipulating patterns of electrical stimulation with the goal of improving speech recognition in noise and music perception for CI users. The second primary area of our research is focused on understanding the effects of electrical stimulation of the auditory nerve on the auditory cortex, with the goal of using that information to influence the design of future generations of cochlear implants and CI speech processing strategies.

Spring 2009 – Present

Duke University, Durham, NC

Research Assistant

We investigated the ability of tuned, multi-rate sound processing strategies to improve speech recognition in noise and music perception by cochlear implant users. Our research involved the collection of rate-based psychophysical data and the application of that data to tuned multi-rate sound processing strategies. Speech recognition tests were used to evaluate the potential for untuned and tuned multi-rate strategies to provide some benefit over clinically available N-of-M strategies. Psychophysical experiments and speech recognition tests were developed and performed with the SPEAR3 developmental sound processor and Cochlear Corporation's Nucleus Implant Communicator (rev 2).

Fall 2004 – Spring 2009

We also collaborated with Dr. Lianne Cartee of NC State University. The goal of this collaboration was to determine the effects of stimulus polarity on evoked compound action potentials (ECAPs), and ultimately to tie ECAP measurements to loudness growth functions. The clinical goal of this project was to be able to predict loudness for non-communicative implant recipients. We were using Advanced Bionics hardware and the BEDCS software to implement all experiments for this project.

University of North Texas, Denton, TX

Undergraduate Research Assistant

Helped develop optics hardware setup to test fluorescence of diseased tissue in the oral cavity of canines.

Spring 2004

TEACHING EXPERIENCE

Duke University, Durham, NC

Teaching Assistant – to Professor Kishor Trivedi in “Mathematical Methods of System Analysis.” Held weekly office hours and graded all written work. **Fall 2006 – Fall 2008**

Teaching Assistant – to Professor Leslie Collins in “Signals and Systems.” **Fall 2004**
Met with students upon request, held MATLAB® review and help sessions and held review sessions prior to exams.

AWARDS

- Graduate Research Fellowship for the 2008 Summer Howard Hughes Vertical Integration Partnership Program **Summer 2008**
 - Association for Research in Otolaryngology 2007 MidWinter Meeting Travel Award **Spring 2007**
-

REFEREED JOURNAL PUBLICATIONS

- Stohl, J. S., Throckmorton, C. S., and Collins, L. M., “Investigating the Effects of Stimulus Duration and Context on Pitch Perception by Cochlear Implant Users”, *Journal of the Acoustical Society of America*, *In press*.
 - Stohl, J. S., Throckmorton, C. S., and Collins, L. M., “Assessing the Pitch Structure Due to Multiple Rates and Places in Cochlear Implants”, *Journal of the Acoustical Society of America*, Vol. 123, No. 2, February, 2008, 1043-1053.
 - Vaidyanathan V., Wiggs R., Stohl J. and Baxi, M., “ALA-Induced Fluorescence in the Canine Oral Cavity”, *Journal of Photomedicine and Laser Surgery*, Vol. 24, No. 3, June, 2006, 383-388.
-

TECHNICAL REPORTS

- Stohl, J. S., Throckmorton, C. S., and Collins, L. M., “Developing a Flexible SPEAR3-Based Psychophysical Research Platform for Testing Cochlear Implant Users”, Duke University, Durham, NC, USA, 2008
-

INVITED TALKS

- Stohl, J. S., Throckmorton, C. S., and Collins, L. M., “Investigating the Influence of Pulse Rate and Duration on Pitch Perception in Cochlear Implants”, *Acoustics '08 Paris*, Paris, France, June, 2008.
 - Stohl, J. S., Throckmorton, C. S., and Collins, L. M., “Multi-rate Psychophysics and Their Application to a Tuned Multi-rate Cochlear Implant Sound Processing Strategy”, Holy-hour-lunch Session, KU Leuven’s ExpORL Laboratory, Leuven, Belgium, July, 2008.
 - Stohl, J. S., Throckmorton, C. S., Hedlund, K. D., Torriano, P. A., Morton, K. D., and Collins, L. M., “From Cochlear Implants to BCI Processing - Ongoing Research at Duke University”, Wadsworth Center, Albany, New York, July, 2008.
-

INVITED REFEREED CONFERENCE PROCEEDINGS

- Stohl, J. S., Throckmorton, C. S., Kucukoglu, M. S., and Collins, L. M., “Using the SPEAR3 to Implement Psychophysical Experiments in Cochlear Implant Subjects,” *Cochlear Americas 2nd NIC Workshop*, Seattle, WA, October, 2006.
-

CONFERENCE SESSION MODERATOR

- “Auditory Prosthesis”, Midwinter Research Meeting, Association for Research in Otolaryngology, Baltimore, Maryland, February, 2006.
-

CONFERENCE ABSTRACTS AND PRESENTATIONS

- Stohl, J. S., Throckmorton, C. S., and Collins, L. M., “Investigating the Acute and Longitudinal Benefits to Speech Recognition of a Tuned Multi-rate Speech Processing Algorithm for Cochlear Implants”, Poster presented, *Conference on Implantable Auditory Prostheses*, Lake Tahoe, California, July, 2009.
-

CONFERENCE ABSTRACTS AND PRESENTATIONS CONTINUED

- Stohl, J. S., Throckmorton, C. S., and Collins, L. M., "The Effect of Duration on Multi-Rate Pitch Perception in Cochlear Implants", Podium session, MidWinter Research Meeting, Association for Research in Otolaryngology, Phoenix, AZ, February, 2008.
- Stohl, J. S., Throckmorton, C. S., and Collins, L. M., "Evaluating the Pitch Structure Due to Multiple Rates and Places for Cochlear Implant Users", Poster presented, Conference on Implantable Auditory Prostheses, Lake Tahoe, California, July, 2007.
- Stohl, J. S., Throckmorton, C. S., and Collins, L. M., "Investigating the Impact of Duration on Pitch Cues in Cochlear Implants", Poster presented, Conference on Implantable Auditory Prostheses, Lake Tahoe, California, July, 2007.
- Stohl, J. S., Throckmorton, C. S., and Collins, L. M., "Implementing a Psychophysical Interface for the SPEAR3", Poster presented, 152nd Meeting of the Acoustical Society of America, Honolulu, Hawaii, November, 2006.
- Stohl, J. S. and Collins, L. M., "Encoding Additional Information via Variable Stimulation Rates in Cochlear Implants: Investigating Potential Benefits to Music Appreciation Using Acoustic Models", Podium session, MidWinter Research Meeting, Association for Research in Otolaryngology, Baltimore, Maryland, February, 2006.

PROFESSIONAL SOCIETY MEMBERSHIPS

- Association for Research in Otolaryngology (September 2009 – Present)
 - Institute for Electrical and Electronics Engineers (March 2002 – Present)
-