

Steven M. Lulich, Ph.D.

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Employment

Research Scientist, Sensimetrics Corporation, 2008-present
Research Affiliate, MIT, 2006-present
Speech Communication Group, Research Laboratory of Electronics
Lecturer, MIT, 2008
Harvard-MIT Division of Health Sciences & Technology
Post-Doctoral Research Fellow, Harvard School of Public Health, 2006-2008
Molecular and Integrative Physiology Program
Jeffrey Fredberg lab

Education

Ph.D. Speech and Hearing Bioscience and Technology, MIT, 2006
Dissertation title: The role of lower airway resonances in defining vowel feature contrasts
Doctoral advisor: Kenneth N. Stevens, Sc.D.
A.B. Linguistics, Dartmouth College, 2002 (cum laude with high honors)
Exchange Student, University of Stuttgart, 2000/2001

Research Interests

Acoustics and airflows in the subglottal airways. Effects of subglottal acoustics and airflows on speech production and perception in children and adults.
Anatomical and mechanical properties of vocal folds and other tissues in the speech/respiratory system. Interaction of tissue geometry and mechanics with acoustics and airflows.
Linguistics, speech and hearing technology, and clinical applications.

Courses Taught

Speech Communication, MIT, Spring 2008 (graduate level course in speech production, perception, and technology).
Speech Acoustics, Budapest University of Technology and Economics, Spring 2009 (graduate level course in speech production, perception, and technology; taught by video conference).

Publications and Proceedings

1. Steven M. Lulich. (in preparation) *On the relation between locus equations and subglottal resonances*. Proceedings of Meetings on Acoustics (POMA), Acoustical Society of America.
2. Steven M. Lulich, Lindsay J. Whaley. (in preparation) *An acoustic phonetic study of Oroqen vowels*. In Recent Advances in Tungusic Linguistics (eds. L. J. Whaley and A. Malchukov).
3. Shizhen Wang, Abeer Alwan, Steven M. Lulich. (submitted) *Automatic detection of the second subglottal resonance and its application to speaker normalization*. Journal of the Acoustical Society of America.

4. Steven M. Lulich. (in press) *Subglottal resonances and distinctive features*. Journal of Phonetics.
5. Shizhen Wang, Steven M. Lulich, Abeer Alwan. (2008) *A reliable technique for detecting the second subglottal resonance and its use in cross-language speaker adaptation*. Interspeech, 1717-1720.
6. Andreas Madsack, Steven M. Lulich, Wolfgang Wokurek, Grzegorz Dogil. (2008) *Subglottal resonances and vowel formant variability: A case study of High German monophthongs and Swabian diphthongs*. In Proceedings of LabPhon11, 91-92.
7. Shizhen Wang, Abeer Alwan, Steven M. Lulich. (2008) *Speaker normalization based on subglottal resonances*. In Proceedings of the International Conference on Acoustics, Speech, and Signal Processing (ICASSP), pp. 4277-4280.
8. Steven M. Lulich, Asaf Bachrach, Nicolas Malyska. (2007) *A role for the second subglottal resonance in lexical access*. Journal of the Acoustical Society of America 122(4):2320-2327.
9. Steven M. Lulich (2004) *Russian [v]: An acoustic study*. Folia Linguistica Europea 38:63-85.
10. Steven M. Lulich, Paul Thompson. (2002) *Lexicon development and the infosphere*. Language Resources Evaluation Conference (LREC) Question Answering workshop.

Presentations and Posters

1. *Automatic Classification of Consonant-Vowel Transitions Based on Subglottal Resonances and Second Formant Frequencies*. (submitted) Acoustical Society of America, 157th Meeting. [with Nancy F. Chen].
2. *Source-Filter Interaction in the Opposite Direction: Subglottal Coupling and the Influence of Vocal Fold Mechanics on Vowel Spectra during the Closed Phase*. (submitted) Acoustical Society of America, 157th Meeting. [with Matías Zañartu, Daryush D. Mehta, and Robert E. Hillman].
3. *On the relation between locus equations and subglottal resonances*. (2008) Acoustical Society of America, 156th Meeting.
4. *Development of subglottal quantal effects in young children*. (2008) Acoustical Society of America, 156th Meeting. [with Youngsook Jung and Kenneth N. Stevens].
5. *Closed Phase Coupling and Vocal Fold Mechanics*. (2008) Voice Quality Study Group, MIT.
6. *On the use of speech acoustics to probe biomechanical properties of vocal fold tissues*. (2008) First International Symposium on Audible Acoustics in Medicine and Physiology, Purdue University.
7. *Subglottal coupling during the closed phase*. (2008) Voice Center Research Forum, Center for Laryngeal Surgery and Voice Rehabilitation, Massachusetts General Hospital.
8. *What subglottal acoustics tell us about speech and language*. (2007) CID at Washington University School of Medicine.
9. *Paying attention to details: The small but important effects of subglottal resonances in speech*. (2007) Speech Perception and Auditory Processing Laboratory, UCLA.
10. *Paying attention to details: The small but important effects of subglottal resonances in speech*. (2007) Laboratoire de Phonétique et Phonologie, University of Paris; Institut für Maschinelle Sprachverarbeitung, University of Stuttgart; Laboratory of Speech Technology, Budapest University of Technology and Economics.
11. *Modeling the effects of the lower airway on vowel spectra*. (2006) Acoustical Society of America, 151st Meeting.
12. *On the coupling of upper and lower airways in speaking and breathing*. (2006) HST Forum, Harvard-MIT Division of Health Sciences and Technology.
13. *From memory to speech and back: How does it work?* (2006) Gabrieli Lab Meetings, MIT Department of Brain and Cognitive Sciences.
14. *Towards an understanding of lower airway effects in speech production and perception*. (2006) Eaton-Peabody Work-in-Progress Talks, Eaton-Peabody Laboratory of Auditory Physiology.

15. *Subglottal resonances in speech production and perception*. (2006) 1st UMass-Amherst/MIT Phonology Meeting, UMass, Amherst Department of Linguistics.
16. *Oroqen acoustic phonetic fieldwork and analysis*. (2005) Speech Group Seminar, MIT Research Laboratory of Electronics.
17. *Oroqen*. (2005) Phonetics Lab Meeting, Yale Linguistics Department.
18. *Oroqen phonetics and phonology*. (2005) Ling-Lunch, MIT Department of Linguistics and Philosophy.
19. *A role for tracheal resonances in speech perception*. (2005) Acoustical Society of America, 149th Meeting. [with A. Bachrach and N. Malyska; winner of the Best Student Presentation Competition].
20. *Do tracheal resonances play a role in speech perception?* (2005) HST Forum, Harvard-MIT Division of Health Sciences and Technology.
21. *Speech acoustics and physiology*. (2005) Department of Physiology, Dartmouth Medical School.
22. *The role of the tongue root in speech production*. (2004) End of Summer Symposium, Harvard-MIT Division of Health Sciences and Technology.
23. *Articulatory and acoustic properties of voiced and voiceless labiodental fricatives in English*. (2003) End of Summer Symposium, Harvard-MIT Division of Health Sciences and Technology.
24. *Russian [v]: An acoustic study*. (2003) Phonology Circle, MIT Department of Linguistics and Philosophy.
25. *Speech Sensorimotor Adaptation: Preliminary Studies in Human Subjects*. (2003) HST Forum, Harvard-MIT Division of Health Sciences and Technology [with Julie Yoo and Virgilio Villacorta].
26. *The phonetics and phonology of [v] in Contemporary Standard Russian*. (2002) University of Stuttgart Graduiertenkolleg: Sprachliche Repräsentationen und ihre Interpretation.
27. *The phonetics and phonology of [v] in Contemporary Standard Russian*. (2002) UTASCIL-9, University of Texas-Arlington.

Honors and Awards

Best Student Presentation; 149th meeting of the Acoustical Society of America, 2005 (with A. Bachrach and N. Malyska).

Academic Excellence award; Program in Linguistics and Cognitive Science, Dartmouth College, 2002.

Federation of German-American Clubs Student Exchange program; Federation of German-American Clubs, academic year, 2000/2001.

First Year Summer Research Grant; Dartmouth College, Summer 1999.