

# CURRICULUM VITAE

RAYMOND L. GOLDSWORTHY

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## TITLES AND AFFILIATIONS

Research Scientist  
Sensimetrics Corporation  
Research and Development

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## ADDRESS

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## EDUCATION

May 2005	<b>Ph.D.</b> , Harvard-MIT Division of Health Sciences & Technology Massachusetts Institute of Technology, Cambridge, MA Specialization: Speech and hearing biosciences and technology with an emphasis on psychoacoustics and signal processing for cochlear implants. Thesis Title: Noise reduction algorithms and performance metrics for improving speech reception in noise for cochlear implant users.
June 1996	<b>B.Sc.</b> , Physics University of Kentucky, Lexington, KY

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## GRANTS

2011 - 2014	NIH NIDCD R43 DC010524-02 (\$1,149,472) <i>Software for auditory prosthesis research</i>
2009 - 2011	NIH NIDCD R43 DC010524-01 (\$95,932) <i>Software for auditory prosthesis research</i>
2006 - 2009	NIH NIDCD R43 DC007034-02 (\$719,076) <i>Noise reduction for cochlear implants</i>
2005 - 2006	NIH NIDCD R43 DC007034-01 (\$52,543) <i>Two-microphone noise reduction for cochlear implants</i>

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## AWARDS AND FELLOWSHIPS

2005	Australian American Association Award
1997	Phi Beta Kappa, University of Kentucky

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## TEACHING

I enjoy interacting with students and teaching in the classroom. I would be comfortable teaching core engineering courses based on linear algebra, advanced engineering mathematics, and probability theory and statistics. My area of expertise is in digital signal processing so I would be comfortable teaching graduate-level courses in signals and systems, digital signal processing, speech processing, and adaptive signal processing.

Summer 2012-2013	HRI, Summer Internship Program Co-director of undergraduate summer internship program.
Fall 2005-2009	Smith College, Neuroscience Program EGR 380: Neuroengineering Lectures on psychoacoustics and signal processing for cochlear implants.
Spring 2005-2009	MIT, Division of Health Sciences and Technology BME 9.04: Neural Basis of Vision and Audition Lectures on signal processing for auditory devices.
Fall 2005-2009	Boston University, College of Health and Rehabilitation Sciences SH 542: Aural Rehabilitation Lectures on auditory rehabilitation.
2005-2006	Advisor for Hampshire College Honors Thesis Project: <i>Music as a rehabilitation tool for cochlear implant users.</i>
Fall 2003	MIT, Division of Health Sciences and Technology EE 6.343: Digital Speech Processing Teaching Assistant.
Fall 2003	MIT, Division of Health Sciences and Technology HST 541: Quantitative Physiology: Cells and Tissues Teaching Assistant.
1995-1997	High school physics instructor Woodbridge Academy; Lexington, KY

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## PROFESSIONAL EXPERIENCE

2005 - present	Research Scientist Sensimetrics Corporation Research and Development
2010 - 2013	Adjunct Scientist Division of Communications and Auditory Neuroscience House Research Institute
2004 - 2005	Research Fellow, Cooperative Research Centre for Cochlear Implant and Hearing Aid Innovation, Melbourne, Australia

1999 - 2005	Graduate Research Fellow Massachusetts Institute of Technology & Research Laboratory of Electronics Cambridge, MA Advisor: Julie E. Greenberg Thesis title: Noise reduction algorithms and performance metrics for improving speech reception in noise for cochlear implant users Concentration Area: Psychoacoustics and Signal Processing.
1995-1997	Teacher Woodbridge Academy; Lexington, KY

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## SERVICE & MEMBERSHIPS

### House Research Institute

2012 - Pres. Co-coordinator of House Research Institute Summer Internship Program

### Extramural

2012 Grant Reviewer for Capita Foundation Research Grants

2007 - Pres. Reviewer for Ear and Hearing, Hearing Research, Journal of the Acoustical Society of America, Journal of the Association for Research in Otolaryngology, and Journal of Speech, Language, and Hearing Research.

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## PUBLICATIONS, ABSTRACTS & PRESENTATIONS

### Refereed Publications

- 1 **Goldsworthy, R.L. (2014).** *Correlations between frequency discrimination and phoneme identification in cochlear implant users and their normal hearing peers.* J. Acoust. Soc. Am., Under Review.
- 2 **Goldsworthy, R.L.,** Delhorne, L.A., Desloge, J.G., and Braida, L.D. (2014). *Target-isolating beamforming strategy provides speech reception benefits for cochlear implant users in difficult acoustic environments.* J. Acoust. Soc. Am., Under Review.
- 3 **Goldsworthy, R.L.** and Shannon. R.V. (2013). *Training improves cochlear implant rate discrimination on a psychophysical task.* J. Acoust. Soc. Am., 135, 334-341.
- 4 **Goldsworthy, R.L.,** Delhorne, L.A., Braida, L.D., and Reed, C.M. (2013). *Psychoacoustic and phoneme identification measures in cochlear-implant and normal-hearing listeners.* Trends in Amplification, 17, 27-44.
- 5 **Goldsworthy, R.L.** and Greenberg, J.E. (2004). *Analysis of speech-based Speech Transmission Index methods with implications for non-linear operations.* J. Acoust. Soc. Am., 116, 3679-3689.
- 6 Payton, K.L., Braida, L.D., Chen, S., Rosengard, P., and **Goldsworthy, R.L. (2003).** *Computing the STI using speech as a probe stimulus.* In Past, present and future of the Speech Transmission Index. TNO Human Factors, The Netherlands.

## Abstracts

- 1        **Goldsworthy, R.L.** and Martinez, A. (2013). *Pitch and phoneme perception in cochlear implant users*. American Auditory Society Scientific and Technology Meeting.
- 2        **Goldsworthy, R.L.**, Delhorne, L.A., Reed, C.M., and Braida, L.D., (2012). *Noise reduction strategy provides speech reception benefits for cochlear implant users*. The Association for Research in Otolaryngology MidWinter Meeting.
- 3        **Goldsworthy, R.L.** and Shannon, R.V. (2011). *Improvements in rate discrimination after training in adult cochlear implant recipients*. Conference on Implantable Auditory Prosthesis.
- 4        **Goldsworthy, R.L.**, Desloge, J.D., and Zurek, P.M. (2009). *Evaluation of a novel noise reduction method*. Conference on Implantable Auditory Prosthesis.
- 5        **Goldsworthy, R.L.** and Greenberg, J.E. (2003). *Predicting the intelligibility of cochlear implant speech processing*. Conference on Implantable Auditory Prosthesis.
- 6        **Goldsworthy, R.L.** and Greenberg, J.E. (2001). *Using STI as a performance metric for cochlear implant users*. Conference on Implantable Auditory Prosthesis.
- 7        **Goldsworthy, R.L.** and Greenberg, J.E. (2000). *Beamforming algorithms used for noise reduction*. American Speech-Language-Hearing Association Audiology Conference.
- 8        **Goldsworthy, R.L.** and Greenberg, J.E. (1999). *Using STI as a performance metric for cochlear implant users*. Conference on Implantable Auditory Prosthesis.

## Invited Talks

- 1        University of California at Los Angeles, Los Angeles, CA (2013)
- 2        Boston University, Boston, MA (2013)
- 3        Smith-Kettlewell Institute, San Francisco, CA (2013)
- 4        Waisman Center, University of Wisconsin-Madison, Madison, WI (2012)
- 5        Ear Club Seminar, University of California, Berkeley, CA, (2012)
- 6        Bionic Ear Institute, Melbourne, Australia, (2008)
- 7        Boys Town Research Hospital, Omaha, NB, (2006, 2009)
- 8        Ohio University, Athens, OH (2006)
- 9        Washington University, St. Louis, MO (2006)
- 10      Indiana University-Purdue University Indianapolis, Indianapolis, IN (2004)

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## REFERENCES

Letters will be provided upon request

### **Patrick M. Zurek**

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Sensimetrics Corporation  
Malden, MA

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### **Louis D. Braid**

Co-Director, Speech and Hearing Bioscience and Technology Doctoral Program,  
Henry Ellis Warren Professor of Electrical Engineering  
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Cambridge, MA

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### **Rahul Sarpeshkar**

Professor, Analog Circuits and Biological Systems Group  
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### **Robert V. Shannon**

Research Professor, USC Biomedical Engineering  
Adjunct Professor, USC Neuroscience  
Los Angeles, CA

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