

PROGRAMMING SKILLS

C, C++, FORTRAN, Matlab, MEX (embedded, real-time executable) Visual Basic, SPSS
Linux, Unix and Windows environments.
Parallel Computing; Computational Modeling

EDUCATION

Ph.D. **Massachusetts Institute of Technology**
Harvard-MIT Division of Health Sciences & Technology (HST)
Program: Speech & Hearing Bioscience and Technology
February, 2010
Areas: Perception/Psychophysics, Neuroscience, Multisensory Integration

2006–2010 ***Interactions Between Auditory and Vibrotactile Stimulation:
A Study of Perceptual Effects***

Louis D. Braida, Ph.D., Charlotte M. Reed, Ph.D. (co-advisors) and Christopher I. Moore, Ph.D. (Chair)

2006-2010 Explores the perceptual relationship between the senses of audition and touch in normal hearing humans. The detection of a combined auditory-vibrotactile signal was measured by systematically varying such parameters as relative phase, onset timing, frequency, and intensity. An auditory-tactile loudness-matching experiment measured sensory integration as a function of critical band. Models of integration are suggested based on recent findings in neurophysiology.

2003 – 2006 Explored the relationship between auditory perception and neural responses in the auditory cortex of normal hearing humans. The perception of auditory stream segregation as a function of frequency was concurrently measured with functional magnetic resonance imaging (fMRI). Results were related to previous fMRI studies of auditory presentation rate changes in the auditory cortex. (Wilson et al. 2007)

M.S. **University of Nevada, Reno**
Computer Engineering, August 2001
Area: Computational Neuroscience

2000–2001 ***Parallel Implementation of a Large Scale Biologically Realistic NeoCortical Neural
Network Simulator***
Frederick C. Harris, Jr., Ph.D., (Chair)

Designed and developed a computational model of mammalian neocortex. Model accurately simulated neuronal, channel and synaptic dynamics and implemented a network on the order of hundreds of thousands to millions of cells.

B.S., B.A. **University of Connecticut**
December 1994
Computer Science & Engineering (B.S.); History (B.A.)

EXPERIENCE

2016 – Present Mathematics Lecturer, Northeastern University, Boston, MA

Courses taught:

Math Fundamentals for Games (1260), Calculus 1 for Engineers (1341), Calculus 2 for Engineers (1342), Probability and Statistics (3081), Biostatistics (INSC 1502), Business Calculus (1231)

2016 – Present Research Scientist/Consultant Massachusetts Institute of Technology

- Worked with group on experiments measuring different aspects of hearing impairment as well as tactile perception of speech sounds.
- Wrote computer code to conduct experiments and to statistically analyze experimental data.

2016-2017 Mathematics Lecturer, Wentworth Institute of Technology, Boston, MA

Courses taught:

Linear Algebra, Calculus 2 for Engineers

2013-2016 Mathematics Teacher, Arlington Catholic High School

Courses Taught: *Advanced PreCalculus, Honors PreCalculus, PreCalculus*

- Hands-on projects applying the material we have learned in a summative assessment. Such projects include building a catapult and using the trajectory of the launched candy to derive the equation of a parabola; building a ferris wheel and deriving the trigonometric function of the path of an imaginary rider; using GoogleMaps and trigonometry to measure the surface area of student-selected locales; deriving and building a parabolic solar cooker; using vampires and werewolves to model the exponential growth and decline of populations.

2011-2013 High School Mathematics Teacher, Medford High School.

Courses Taught: *Geometry, Algebra 2, MCAS Math.*

- Engaged students in project based learning to develop critical thinking skills on real-world problems. Incorporated writing and student presentations in assessments in order to foster literacy and communication.

**2010 - 2011 Visiting Scientist, Sensory Communication Group,
Research Laboratory of Electronics,
Massachusetts Institute of Technology, Cambridge, MA**

Designing and conducting psychoacoustic experiments on normal hearing subjects to explore relationship between pitch perception and auditory filter widths. Experiments include multisensory integration between hearing and touch.

2009 - 2011 Post-Doctoral Research Fellow, Department of Neurology

Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, MA

Exploring the neural control of pitch perception and production in humans through neuro-imaging (functional magnetic resonance imaging, fMRI), anatomy (diffusion tensor imaging, DTI) and behavior, focusing on individuals with impaired pitch perception (tone-deafness). Developed a real-time hardware and software system to provide perturbed auditory feedback using C++ and Matlab.

Fall 2008	Teaching Assistant	Acoustics of Speech & Hearing (6.551j), MIT,
2008	Instructor	Psychophysics & Multisensory Integration Tutorial, MIT,
2005, 2007	Instructor	Auditory Neuroscience, MIT SPLASH

AWARDS

NIH Training Grant	2007 - 2009
Hertz Foundation Graduate Research Fellowship	2002 - 2007

SERVICES

Speech & Hearing Bioscience and Technology Admissions Committee, 2006 - 2010

INDUSTRY EXPERIENCE

1998	Senior Software Engineer	Advanced Fibre Communications Petaluma, CA
1997-1998	Senior Software Engineer & Project Manager	Charles Schwab & Co., San Francisco, CA
1995-1997	Lead Software Engineer	AT&T Wireless Services, Inc. Kirkland, WA
1992-1993 (Internship)	Software Design Engineer	Microsoft Corp. Redmond, WA
1991 (Summer-Internship)	Programmer	IBM Entry Systems Division Austin, TX
1990 (Summer 1989, Internship)	Programmer	IBM, TJ Watson Research Center Hawthorne, NY

REFERENCES

Louis D. Braida, Ph.D., Henry Ellis Warren Professor of EE & HST
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Charlotte M. Reed, Ph.D., Senior Research Scientist
E. Courtenay Wilson

Research Laboratory of Electronics, MIT

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Frederick C. Harris, Jr., Ph.D., Professor

Department of Computer Science, University of Nevada, Reno

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Jane Seminara, Colleague and Department Chair of Theology

Arlington Catholic High School, Arlington, MA

email: jseminara@achs.net

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David Blauch, Assistant Principal

Medford High School, Medford, MA

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PUBLICATIONS

Tan HZ, Reed CM, Jiao Y, Perez ZD, Wilson EC, Jung J, Martinez JS, Severgnini FM, *Acquisition of 500 English Words through a Tactile Phonemic Sleeve (TAPS)*, IEEE Transaction on Haptics, under review.

Reed CM, Tan HZ, Jiao Y, Perez ZD, Wilson EC, *Identification of Words and Phrases Through a Phonemic-Based Haptic Display: Effects of Inter-Phoneme and Inter-Word Interval Durations*, Transactions on Applied Perception, under review.

Reed CM, Tan HZ, Perez ZD, Wilson EC, Severgnini FM, Jung J, Martinez JS, Jiao Y, Israr A, Lau F, Klumb K, Turcott R, Abnoui F. *A Phonemic-Based Tactile Display for Speech Communication*. IEEE Trans Haptics. 2019 Jan-Mar;12(1):2-17. Epub 2018 Jul 30.

Ranjbar P, Wilson EC, Reed CM, Braida LD. *Auditory-Tactile integration: Effects of Phase of Sinusoidal Stimulation at 50 and 250 Hz*. Int J Eng Technol Sci Innov. 2016 Apr;1(2):209-229.

Wilson, EC, Perez, ZD, Braida, LD, and Reed CM. *Predicting performance across different psychoacoustic tasks*. Poster for Acoustical Society of America, Boston Meeting, 2017, pg 3901.

Wilson, E. Courtenay, Reed, Charlotte M., Braida, Louis D., **(2010)**. *Integration of auditory and vibrotactile stimuli: effects of frequency*. Journal of the Acoustical Society of America. **127** (5): 3044-3059. May.

Wilson, E. Courtenay, Reed, Charlotte M., Braida, Louis D., **(2010)**. *Perceptual interactions in the loudness of combined auditory and vibrotactile stimuli*. Journal of the Acoustical Society of America. **127** (5): 3038-3043. May.

Wilson, E. Courtenay, Reed, Charlotte M., Braid, Louis D., (2009). *Integration of auditory and vibrotactile stimuli: effects of phase and stimulus-onset asynchrony*. Journal of the Acoustical Society of America. **126** (4):1960-74. October.

Wilson, E. Courtenay, Melcher, Jennifer R., Micheyl, Christophe, Gutschalk, Alexander, Oxenham, Andrew J. (2007), *Cortical fMRI activation to sequences of tones alternating in frequency: Relationship to perceived rate and streaming*. Journal of Neurophysiology 97 (3): 2230-2238 March

Micheyl, Christophe, Carlyon, Robert P., Gutschalk, Alexander, Melcher, Jennifer R., Oxenham, Andrew J., Rauschecker, Josef P., Tian, Biao, Wilson, E. Courtenay (2007). *The role of auditory cortex in the formation of auditory streams*. Hearing Research 229 (1-2): 116-131 July

Gutschalk, Alexander, Oxenham, Andrew J., Micheyl, Christophe, Wilson, E. Courtenay, Melcher, Jennifer R. (2007). *Human cortical activity during streaming without spectral cues suggests a general neural substrate for auditory stream segregation*. Journal of Neuroscience, November 28;27(48):13074-81.

Wilson, E. Courtenay, Reed, Charlotte M., Braid, Louis D. *Perceptual interactions in the loudness of combined auditory and vibrotactile stimuli*. International Multisensory Research Forum, New York, New York July 2009

Wilson, E. Courtenay, Reed, Charlotte M., Braid, Louis D. *Perceptual Interactions Between Vibrotactile and Auditory Stimuli: Effects of Frequency* International Multisensory Research Forum, Hamburg, Germany July 2008

Wilson, E. Courtenay, Reed, Charlotte, M., Braid, Louis D. *Perceptual interactions Between Vibrotactile and Auditory Stimuli: Effects of Frequency*. Association for Research in Otolaryngology Mid-Winter Meeting, Phoenix, AZ, February 2008

Wilson, E. Courtenay, Braid, Louis D., Reed Charlotte M., *The Perception of Auditory-Tactile Integration*. Acoustical Society of America Conference, New Orleans, LA, November 2007

Wilson, E. Courtenay, Melcher, Jennifer R., Micheyl, Christophe, Gutschalk, Alexander, Oxenham, Andrew J. *Auditory Streaming in Humans: Possible fMRI Correlates*. Association for Research in Otolaryngology Mid-Winter Meeting, New Orleans, LA 2005

Micheyl, Christophe, Tian, Biao, Gutschalk, Alexander, Wilson, E. Courtenay, Melcher, Jennifer R., Oxenham, Andrew J., Rauschecker, Josef P., Carlyon, Robert P. *Looking for Correlates of Streaming in Humans and Monkeys* Association for Research in Otolaryngology Mid-Winter Meeting, New Orleans, LA 2005

Wilson, E. Courtenay, Melcher, Jennifer R., Micheyl, Christophe, Oxenham, Andrew J. *Neural Correlates of Auditory Stream Segregation in Humans using fMRI*. Association for Research in Otolaryngology Mid-Winter Meeting, Daytona Beach, FL 2004

E. Courtenay Wilson, Frederick C. Harris, Jr., and Phillip H. Goodman, *A Large-Scale Biologically Realistic Cortical Simulator*. Proceedings of SC2001 November 12-16, 2001, Denver, Colorado

E. Courtenay Wilson, Phillip H. Goodman, and Frederick C. Harris, Jr., *Implementation of a Biologically Realistic Parallel Neocortical-Neural Network Simulator* Proceedings of the Tenth SIAM Conf. on Parallel Process. for Sci. Comp. March 12-14, 2001, Portsmouth, Virginia