Nathaniel A. Whitmal, III, Ph.D., CCC-A
Associate Professor, Department of Communication Disorders
University of Massachusetts
358 N. Pleasant St., Room 305A
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EDUCATION

University of Massachusetts, Amherst, MA
M.A., Communication Disorders, May 2004

Northwestern University, Evanston, IL
Ph.D., Electrical Engineering and Computer Science, June 1997
Thesis: *A Wavelet-Based Noise Reduction Method for Speech Enhancement*
Advisor: Dr. Janet Rutledge

Northwestern University, Evanston, IL
M.S., Electrical Engineering and Computer Science, December 1993
Thesis: *An Evaluation of Noise Reduction Algorithms for Application in Digital Hearing Aids*

Massachusetts Institute of Technology, Cambridge, MA
B.S., Electrical Engineering and Computer Science, June 1986
Thesis: *A Computationally Efficient Method of Predicting Speech Intelligibility*

RESEARCH INTERESTS

Digital signal processing for audio and audiological applications, electroacoustics, algorithms for digital hearing aids and cochlear implants, speech intelligibility.

PROFESSIONAL EXPERIENCE

9/06 to present

University of Massachusetts, Amherst, MA
Associate Professor of Communication Disorders (9/12 to present)
Assistant Professor of Communication Disorders (9/06 to 8/12)

9/05 to 7/06

Ear, Nose, and Throat Associates, Baystate Medical Center, Springfield, MA
Clinical position satisfying certification requirements for the American Speech-Language-Hearing Association (ASHA).

6/04 to 9/06

University of Massachusetts, Amherst, MA
Visiting Assistant Professor of Communication Disorders. On leave from 9/05 to 7/06 to satisfy ASHA certification requirements; CCC-A granted in October 2006.

9/02 to 6/04

University of Massachusetts, Amherst, MA
Research assistant. Responsibilities included writing software & collecting data.

7/99 to 6/02

Worcester Polytechnic Institute, Worcester, MA
Assistant Professor of Electrical and Computer Engineering

6/97 to 6/99

DePaul University, Chicago, IL
Assistant Professor of Computer Science

9/95 to 8/96

Northwestern University, Evanston, IL
Monsanto Foundation Faculty Intern
Internship position with non-tenure track faculty status. Taught one course, supervised undergraduates and an independent study student.

2/86 to 8/92 Bose Corporation, Framingham, MA
Member, Technical Staff
Designed and managed development of transducers, software, and analog circuits for audio applications.

PRE-PROFESSIONAL CLINICAL EXPERIENCE

1/04 to 5/04
9/05 to 7/06 Ear, Nose, and Throat Associates, Baystate Medical Center, Springfield, MA

9/03 to 12/03 Weldon Hearing Center, Mercy Medical Center, Springfield, MA

1/03 to 8/03,
9/04 to 8/05 Center for Language, Speech, and Hearing, University of Massachusetts, Amherst, MA

PUBLICATIONS

Journal papers

N.A. Whitmal and K.DeRoy, "Use of an adaptive-bandwidth protocol to measure importance functions for simulated cochlear-implant frequency channels," Journal of the Acoustical Society of America, vol. 132, pp. 1359-1370, 2012.

N. A. Whitmal and K. DeRoy, "Adaptive-bandwidth measurements of importance functions for speech intelligibility prediction," Journal of the Acoustical Society of America, vol. 131, pp. 4032-4043, 2011.

N. A. Whitmal and S. F. Poissant, "Effects of source-to-listener distance and masking on perception of cochlear implant processed speech in reverberant rooms," Journal of the Acoustical Society of America, vol. 126, pp. 2556-2569, 2009.

N. A. Whitmal, S. F. Poissant, R. L. Freyman, and K. S. Helfer, "Speech intelligibility in cochlear implant simulations: effects of carrier type, interfering noise, and subject experience," Journal of the Acoustical Society of America, vol. 122, pp. 2376-2388, 2007.

S. F. Poissant, N. A. Whitmal, and R. L. Freyman, "Effects of reverberation and masking on speech intelligibility in cochlear implant simulations," Journal of the Acoustical Society of America, vol. 119, pp. 1606-1615, 2006.

N. A. Whitmal, J. C. Rutledge, and J. Cohen, "Reducing correlated noise in digital hearing aids," IEEE Engineering in Medicine & Biology Magazine, vol. 15, no. 5, pp. 88-96, 1996. *Invited paper.*

Book chapters

N. A. Whitmal, J. C. Rutledge, and J. Cohen, "Denoising speech signals for digital hearing aids: a wavelet-based approach," in: Wavelets and Multiscale Analysis: Theory and Applications, Birkhauser Boston, 2011.

Conference presentations

N.A. Whitmal, "Effects of envelope bandwidth on importance functions for implant simulations," American Auditory Society Convention, Scottsdale, Arizona, March 2012.

S. F. Poissant, N.A. Whitmal, and S. Tompkins, "Frequency-transposed vocoded speech augments low-frequency hearing," American Auditory Society Convention, Scottsdale, Arizona, March 2012.

N.A. Whitmal, Y. Liu, and R L. Freyman, "Comparisons of Mandarin and English sentence perception in EAS simulations," 15th Biennial Conference on Implantable Auditory Prostheses (sponsor: House Ear Institute), Pacific Grove, California, July 2011.

S. F. Poissant and N.A. Whitmal, "The effects of multiple, very early reflections on vocoded speech perception," 15th Biennial Conference on Implantable Auditory Prostheses (sponsor: House Ear Institute), Pacific Grove, California, July 2011.

N.A. Whitmal and K. DeRoy, "Adaptive-Bandwidth Measurements of Importance Functions for Speech Intelligibility Prediction," American Auditory Society Convention, Scottsdale, Arizona, March 2011.

N.A. Whitmal and S. F. Poissant, "Monaural Echo Fusion in Cochlear Implant Simulations," American Auditory Society Convention, Scottsdale, Arizona, March 2010.

S. F. Poissant, N.A. Whitmal, and A. Lepine, "Environmental Sounds as Maskers of Cochlear Implant Speech," American Auditory Society Convention, Scottsdale, Arizona, March 2010.

N.A. Whitmal and S. F. Poissant, "The role of early reflections in the perception of spectrally-degraded speech," 14th Biennial Conference on Implantable Auditory Prostheses (sponsor: House Ear Institute), Tahoe City, California, July 2009.

K. DeRoy and N. A. Whitmal, "Adaptive-Bandwidth Measurements of Speech Frequency-Importance Functions," American Speech-Language-Hearing Association Annual Convention, Chicago, IL, November 2008.

A. Griffin, S. F. Poissant and N.A. Whitmal, "Defining the Patterns of Energetic and Informational Masking of Cochlear Implant Processed Speech," 10th International Conference on Cochlear Implants & Other Implantable Auditory Technologies, San Diego, April 2008.

N.A. Whitmal and S. F. Poissant, "Reverberation, Noise, and Distance Effects on Cochlear Implant Speech Perception," American Auditory Society Convention, Scottsdale, Arizona, March 2008.

M. V. Andrianopoulos and N. A. Whitmal, "Evidence based practice and treatment efficacy for voice disorders," American Speech-Language-Hearing Association Annual Convention, Boston, Massachusetts, November 2007.

S. F. Poissant and N.A. Whitmal, "Reverberation, distance, masking, and cochlear implant processed speech," 13th Biennial Conference on Implantable Auditory Prostheses (sponsor: House Ear Institute), Tahoe City, California, July 2007.

S. F. Poissant, J. Raney, E. Carroll, and N. A. Whitmal, "The role of energetic and informational masking in speech understanding in pediatric cochlear implant recipients," 11th International Conference on Cochlear Implants in Children, Charlotte, NC, April 2007.

A. C. Donahue, M. V. Andrianopoulos, and N. A. Whitmal, "The effects of vocal warm-up exercises and hydration on vocal fatigue: a pilot study," 35th Annual Symposium, Voice Foundation, Philadelphia, Pennsylvania, June 2006.

S. F. Poissant, N.A. Whitmal, and R.L. Freyman, "Effects of reverberation and various maskers on sentence intelligibility in cochlear implant simulations," 12th Biennial Conference on Implantable Auditory Prostheses (sponsor: House Ear Institute), Asilomar, California, July 2005.

M. V. Andrianopoulos, N. A. Whitmal, and K. Astin, "Evidence based practice: symptomatic behavioral voice therapy revisited," 34th Annual Symposium, Voice Foundation, Philadelphia, Pennsylvania, June 2005.

N.A. Whitmal, S.F. Poissant, R.L. Freyman, and K.S. Helfer, "Effect of low-noise noise carriers on speech intelligibility in simulations of cochlear implant processors with normal-hearing listeners," 28th Annual Mid-Winter Meeting of the Association of Research in Otolaryngology, New Orleans, Louisiana, February 2005.

N.A. Whitmal, S.F. Poissant, R.L. Freyman, and K.S. Helfer, "Effect of combining different carriers across bands on speech intelligibility in cochlear implant simulation," 27th Annual Mid-Winter Meeting of the Association of Research in Otolaryngology, Daytona Beach, Florida, February 2004.

N.A. Whitmal, "Implementation and assessment of a studio-style course in real-time digital signal processing," 2002 ASEE Conference & Exhibition, Montreal, June 2002.

N. A. Whitmal and A. Vosoughi, "Recruitment-of-loudness effects of attenuative noise reduction algorithms," 143rd mtg. of the Acoustical Society of America, Pittsburgh, June, 2002.

M.A. Trenas, J.C. Rutledge, and N.A. Whitmal, "Wavelet-based noise reduction and compression for hearing aids," Proc. IEEE Engineering in Medicine & Biology Society's 21st Intl. Conf., October, 1999.

N.A. Whitmal and J.C. Rutledge, "Noise reduction in hearing aids: a case for wavelet-based methods," Proc. IEEE Engineering in Medicine & Biology Society's 20th Intl. Conf., October 1998, vol. III, pp. 1130-1135. *Invited paper.*

N. A. Whitmal, J. C. Rutledge, and L.A. Wilber, "An evaluation of wavelet- based noise reduction for digital hearing aids," Proc. IEEE Engineering in Medicine & Biology Society's 19th Intl. Conf., October, 1997.

N. A. Whitmal, J. C. Rutledge, and J. Cohen, "Reduction of autoregressive noise with shift-invariant wavelet-packets," Proceedings of the IEEE-SP Third International Symposium on Time-Frequency & Time-Scale Analysis, pp. 137-140, June, 1996.

GRANT AWARDS

Frequency Importance Functions for Cochlear Implant Processing, SPHHS Dean's Faculty Research Enhancement Grant, Nathaniel Whitmal, $10000, 2012-2013.

Mutual Mentoring for Grant Proposal Writing, Nathaniel Whitmal (PI), Mellon Foundation c/o Provost's Office, University of Massachusetts, $1200, Fall 2007.

NIDCD R03 DC7969: *Impact of Reverberation on Speech Perception in Cochlear Implant Users,* Sarah Poissant (PI) and Nathaniel Whitmal (co-PI), National Institute of Deafness and Other Communication Disorders, $156,792, 2005-2007.

Implementation of a Studio-Style Course in Real-Time Digital Signal Processing. $52,305, Texas Instruments, 2000-2001: equipment support for courses EE 3703 and EE 539A at WPI.

COURSES TAUGHT

Univ. Massachusetts
Undergraduate:
COMDIS 312: Intro. to Speech Science (Spring 2005, Spring 2007-2013)
COMDIS 211: Anatomy & Physiology of the Speech & Hearing Mechanism (Fall 2005)

Graduate:
COMDIS 642: Hearing Aids and Amplification (Spring 2007-2013)
COMDIS 697a: Instrumentation in Audiology (Fall 2005 (team-taught), Fall 2007-2013)
COMDIS 630: Intro. to Graduate Research (Fall 2004)
COMDIS 691: Graduate Seminar (Fall 2008-2013)

WPI
Undergraduate:
EE 3703: Real-time Digital Signal Processing (B-Term 2000, 2001, D-Term 2001)
EE 2022: Intro. to Digital Logic & Computer Engineering (D-Term 2000)

Graduate:
EE 539A: Real-time Digital Signal Processing (Spring 2002)
EE 503: Digital Signal Processing (Fall 1999-2001)

DePaul Univ.
CSC 323: Data Analysis & Statistical Software (Fall 1998, Winter 1999, Spring 1999, Summer 1999)
CSC 312: Assembly Language & Computer Organization (Spring 1999)
CSC 310: Principles of Computer Science I (Winter 1999)
TDC 462: Data Communications (Fall 1999)
CSC 599: Advanced Topics in Digital Signal Processing (Fall 1999)
CSC 498: Digital Signal Processing (Spring 1998)
TDC 411: Computers in Telecom. & Information Systems (Fall 1997, Winter 1998, Spring 1998)
CSC 491: Design & Analysis of Algorithms (Summer 1997)

Northwestern Univ.
730-C96: Special Topics; Time Series Analysis & Wavelets (Spring, 1996)

COMMITTEES

UMass
Special Commission on the Code of Student Conduct and Judicial Process (4/10 – 5/11)
Faculty Senate Council on Status of Diversity (11/08 – 5/10)
Leadership Conference Committee, Communication Disorders Dept. (9/08 – present)
Clinical Research Advisory Board, Communication Disorders Dept. (9/08 – 8/09)
MSP Worklife Committee (9/07 – 8/10)
Academic Honesty Board (9/07 – present)
Personnel Committee, Communication Disorders Dept. (9/06 – 5/08)
MSP Liaison, Communication Disorders Dept. (9/06 – 5/08)
Service and Outreach Committees, Communication Disorders Dept. (9/04 – 9/05)
Faculty Search Committee, Environmental Health Sciences Program (2004-2005, 2006-2007, 2008-2009, 2009-2010)
Department Head Search Committee, Electrical Engineering Dept. (2006-2007)

WPI
ECE Department Undergraduate Program Committee (8/99 – 6/02)
WPI / Mass. Academy Advisory Committee (2/99 – 6/02)

DePaul Univ.
School of CTI Undergraduate and Ph.D. Program Committees, University
Research Council, University Graduate Preparation Committee

JOURNAL REVIEWS
Journal of the Acoustical Society of America (August 2006 – present)
Journal of Speech, Language, and Hearing Research (September 2010 – present)

REVIEW PANELS
NSF Division of Undergraduate Education: Instrumentation and Laboratory Improvement, January 1998 and January 1999; Curriculum Development and Faculty Enhancement, July 1997.

HONORS

UMass
Mellon Mutual Mentoring Grant Awardee (2007-2008)

WPI
Joseph Satin Foundation Faculty Fellowship (2000-2001)

DePaul Univ.
Amoco Foundation Faculty Award (1998-99)

Northwestern Univ.
Walter P. Murphy Graduate Fellowship (1992-1993). National Science Foundation Graduate Fellowship (1993-1994). Council of Graduate Schools Achievement Award for Outstanding Research Paper (NSF Conference, 1994). I & G Graduate Fellowship (1994-1995). Monsanto Faculty Internship (1995-1996). Northwestern University Dissertation Fellowship (1996-1997).

AFFILIATIONS
American Speech-Language & Hearing Association
Acoustical Society of America
IEEE Signal Processing and Engineering in Medicine & Biology Societies
Eta Kappa Nu Society