Carol Espy-Wilson
Department of Electrical and Computer Engineering
Institute for Systems Research
University of Maryland, College Park, MD   20910
espy@umd.edu

Education

Massachusetts Institute of Technology   Cambridge, MA
Department of Electrical Engineering and Computer Science
Doctor of Philosophy in Electrical Engineering   June 1987
Dissertation: An Acoustic-Phonetic Approach to Speech Recognition: Application to the Semivowels
Thesis Advisor: Kenneth Stevens
Electrical Engineer Degree in Electrical Engineering   June 1984
Masters of Science in Electrical Engineering   June 1981
Thesis: Effects of Noise in Signal Reconstruction from its Fourier Transform Phase
Thesis Advisor: Jae Lim

Stanford University   Palo Alto, CA
BS in Electrical Engineering   June 1979

Awards, Honors and Special Recognition

- Xerox Fellow, June 1981 to May 1987
- Clare Boothe Luce Professor, August 1990 to August 1995
- National Institute of Health (NIH) Career Award, 1998-2003
- Honda Initiation Award, 2003 and 2004
- Fellow of the Acoustical Society of America for contributions to speech communication and mentoring, Nov. 2005
- Co author of four Best Student Paper award at meetings of the Acoustical Society of America
- Coauthor of Royster Student Poster Award at ASA Meeting held in 2005.
- Coauthor of First Prize Award for undergraduates working in the NSF MERIT program.
- Radcliffe Fellowship Sept. 2008 to June 2009.
- Co-author of three Best Overall Project awards to undergraduates who participated in NSF-sponsored REU programs during the summer at UMD.
- Fellowship, Radcliffe Institute for Advanced Study, Harvard University, 2008-2009
- Invention of the Year Award for "Multi-pitch tracking in adverse environments," University of Maryland, 2010.
- 2010 Maryland Innovator of the Year Award for "Multi-pitch tracking in adverse environments", Baltimore Daily Record.
- 2010, First Place, University of Maryland $75K Business Plan Competition, High Technology Category ($25,000)
- 2010, First Place, University of Maryland $75K Business Plan Competition, Social Impact Category ($15,000)
- Advance Professor 2011-2012
- 2012-2013 Distinguished Scholar-Teacher Award, University of Maryland
- Co-author of Most Interesting Project Award and Most Technically Challenging Project Award given at the 2010 NSF CISE REU PI Meeting.
- Presented at a Senate Staff Briefing on Science Coalition, Capital Hill, Nov. 21, 2013.

- Presented to the Maryland Board of Regents, Committee On Economic Development and Technology Commercialization, Nov. 21, 2013
- Testified before Senator Elizabeth Warren and Representative Elijah Cummings at a Forum on Critical Federal Investments in Science Research -- *Middle Class Prosperity Project to Explore "Building the Economy of the Future: Why Federal Investments in Science and Innovation Matter",* July 27, 2014
- 2015-2017 Institute for Systems Research Senior Faculty Fellow Award

.

Academic Experience
University of Maryland   College Park, MD
Department of Electrical and Computer Engineering, Institute for Systems Research
2001-2007, Associate Prof., 2007-present Full Prof.
Research and teaching courses in speech and audio processing (graduate level), digital signal processing (senior level)multimedia capstone design (senior level – helped to develop the module on speech processing) and signals and systems (junior level).
Boston University   Boston, MA
Department of Electrical and Computer Engineering
1991-1999, Assistant Prof.; 1999-2001, Assoc. Prof.
Research and teaching in the areas of digital speech processing (developed course at the graduate level), and signals and systems and electric circuit theory.
MIT   Cambridge, MA
Department of Electrical Engineering and Computer Science
1990-1991, Visiting Scientist;
1988-1990, Research Scientist and Recitation Instructor for two undergraduate courses
1987-1988, Postdoctoral Fellow;
Bell Telephone Laboratories   Murray Hill, New Jersey
1987-1988, Part-time member of technical staff, Linguistics Research.
MIT   Cambridge, MA
1988-2001, Associate Housemaster at MacGregor Dormitory; 1985-1988, Graduate Tutor at Macgregor Dormitory.

Industry Experience
OmniSpeech LLC   College Park, MD
I am the Founder and CTO. OmniSpeech has developed single- and dual-mic noise suppression technology, OmniClear, that can be embedded on various DSP platforms, part of any APP or run in the cloud. We are currently in a simulation system for pilots to improve speech recognition and in a wearable being sold in Europe and India.

I have also been a consultant for three companies developing speech technologies.

Professional Service
Editorial Board, *Acoustics Today***,** Acoustical Society of America (2007-2009); Chair, Speech Technical Committee, Acoustical Society of America (2007-2010); Associate Editor**,** Journal of the Acoustical Society of America (2010-present); Advisory Board, NIH NICHD Medical Rehabilitation Board (2010-2013); Advisory Council, NIH National Institutes on Biomedical Imaging and Bioengineering (2015-18); Elected to the Speech and Language Technical Committee of IEEE, 2010-2012; Member, Speech Technical Committee of ASA, 1993-1998; Organizing Committee for the 1994 ASA Conference; Member, Ethics and Grievance

Committee, 1999-2000; Rossing Prize Subcommittee, ASA Committee on Education in Acoustics 2004-2006; Organized the judging of student papers in the Speech Communication area of ASA, Fall 2006 Conference; Archives and History Committee of ASA, 2009-2012; AIP Venture Partnership Fund, 2015-2018

University Service
University of Maryland Committees: Graduate Council Fellowship Committee, 2004; Senate, 2009-2011;Search Committee for VP of Research 2010-2011; Advance Professor 2011-2012; Advisory Board for the Future of Information Alliance, 2011-2012; Appointment, Promotion and Tenure Committee, 2011-2014; Co-led the Advancing Faculty Diversity Program, 2013-2014, 2014-2015.
University of Maryland Engineering Committees: Diversity and Search Committee, 2001 – 2003; Dean Review Committee, 2012-2013; Dean Review Committee, 2003-2004; ECE Chair Search Committee, 2005; College of Engineering Council 2009-2010.
University of Maryland Departmental Committees: Graduate Studies and Research Committee, appointed, non-voting member in 2001; APT Committee, 2003-2005, 2006-2008; Search Committee, 2003-2004; Graduate Studies and Research Committee 2006-2008; Human Relations and Welfare Committee 2009-2010; Undergraduate Affairs Committee 2010-2013; APT Sub-Committee (2012-2013)
Institute for Systems Research: Education Committee, 2002-2004; Executive Committee, 2003-2005 (Chair for a semester); Education Committee, 2005-2007; Facilities and Services Committee 2005-2007 (Chair 2006-2007); ISR Representative to Engineering Council 2009-2011; ISR Representative to the Engineering Council (2013-2015); ISR APT Committee 2014-2016
Massachusetts Institute of Technology: Associate House Master of MacGregor Dormitory 1988-2001; Visiting Resident House Master of Simmons Hall Dormitory, 2008-2009,

Community Service
Board of Trustees at Buckingham, Browne and Nichols (1996-2001); Member, Boston Chapter of the Coalition of 100 Black Women (1990-1992); Panelist for Black History Celebration at High Rock School, Needham, Massachusetts (February 13, 1991); Panelist on "The Life of the Mind", MIT Minority Summer Research Program, MIT (July 15, 1992); Panelist on Roundtable on Science and Engineering, presented at "Black Women in the Academy: Defending our Name, 1894-1994" Conference, MIT Cambridge, MA (January 13-15, 1994); Question and Answer Session about Engineering with high school students, Southwest Dekalb High School, Decatur, Georgia (May 10, 1996); Panelist on "Navigating Graduate School", Alpha Kappa Alpha Sorority for MIT and Wellesley students (Fall, 2000); Served as Role Model for the New England Board of Higher Education's (1991, 1992, 1995, 1996, 1997); 7th Annual Network Meeting focusing on math, science and engineering (Oct. 1996); 8th Annual Network Meeting focusing on math, science and engineering (Oct. 1997); Participated in Youth Career Day sponsored by Myrtle Baptist Church, May 4, 1996; Panelist for the Women in Science Program at UMD (Feb. 27, 2002); Panelist for "Show Me the Money: Effective Techniques for Funding Research" sponsored by the Faculty Affairs Committee, February 5 2002.

INVITED PRESENTATIONS
1. C. Espy-Wilson, "An Investigation of Speech Variability and a Feature-Based Approach to Speech Recognition", National Cash Register, Atlanta, GA, December , 1990.
2. C. Espy-Wilson, "An Investigation of Speech Variability and a Feature-Based Approach to Speech Recognition" Ohio State, Electrical Engineering Department, April, 1991.
3. C. Espy-Wilson, "An Investigation of Speech Variability and a Feature-Based Approach to Speech Recognition", Georgia Tech, Digital Signal Processing Group, August, 1991.

4. C. Espy-Wilson, "An Investigation of Speech Variability and a Feature-Based Approach to Speech Recognition", Boston University, Knowledge-Based Signal Processing Group, 1994.
5. C. Espy-Wilson, "Overview of Speech Recognition Research" Achievement Rewards for College Scientists (ARCS) Foundation, February, 1992.
6. C. Espy-Wilson, "Coarticulatory Stability of American English /r/", MIT, Speech Communication Group, November, 1994.
7. C. Espy-Wilson, "Coarticulation, Speech Variability, and a Feature-Based Approach to Speech Recognition", Boston University, Hearing Research Seminar, Biomed Dept. , April, 1995.
8. C. Espy-Wilson, "A Study of Variability and a Feature-Based Approach to Speech Recognition," NSF CISE Workshop, 1995.
9. C. Espy-Wilson, "Coarticulation, Speech Variability, and a Feature-Based Approach to Speech Recognition" House Ear Institute, December, 1996.
10. C. Espy-Wilson, "Coarticulation, Speech Variability, and a Feature-Based Approach to Speech Recognition" UCLA, Speech Processing and Auditory Perception Lab, December, 1996.
11. C. Espy-Wilson, "Optimizing Acoustic Parameters for Phonetic Features", MIT, Speech Communication Group, March, 1997.
12. C. Espy-Wilson, "Overview of Speech Recognition Research" BU, ECE Dept., June 1997.
13. C. Espy-Wilson, "Overview of Speech Recognition Research", BU, Hearing Research Group, Dec. 5, 1997.
14. C. Espy-Wilson, "A Speech Signal Representation based on Phonetic Features", Lexical Access Group at MIT, Sept. 25, 1998.
15. C. Espy-Wilson , "Research in the Speech Communication Group", ECE Grad Seminar at Boston University, Oct. 23, 1998.
16. C. Espy-Wilson, "Acoustic Modeling of American English /r/", Ohio State, EE Dept., Feb. 10, 1999.
17. C. Espy-Wilson, "Acoustic Modeling of American English /r/", MIT, Speech Communication Group, March 31, 1999.
18. C. Espy-Wilson, "Acoustic Modeling of American English /r/", BU, Hearing Research Group, April 12, 1999.
19. C. Espy-Wilson, "A Phonetic Feature Based Approach to Speech Recognition", Nuance, Menlo CA, Oct. 15, 1999.
20. C. Espy-Wilson, "Electrolaryngeal Speech Enhancement", Northeastern University Technology Expo, Nov. 1999.
21. C. Espy-Wilson, "Digital Signal Processing Techniques to Improve Artificial Larynx Speech", BU, Joint Seminar between the BME Hearing Research Group and the Medical School Otolaryngology Dept., July 12, 2000.
22. C. Espy-Wilson, "The Future of Speech Recognition", invited talk at the S.E.E.ing the Future Conference, sponsored by NSF and Dartmouth College, Dartmouth, MA, Nov. 11-15, 2000.
23. C. Espy-Wilson, "Knowledge-based Speech Recognition, Landmarks and Temporal Processing", Motorolla's Human Interface Labs and the Speech Processing Research Labs, Schaumberg, IL, June 7, 2001.
24. C. Espy-Wilson, "Speech Recognition & Synthesis", Invited Lecture for the Case Media Fellowship Program, Feb. 13, 2002
25. C. Espy-Wilson, "Speech Recognition Research", Computational Linguistics and Information Processing (CLIP) Group at UMD, April 17, 2002
26. C. Espy-Wilson, "Research in the Speech Communication Lab", ECE Faculty Seminar Series, organized by the ECE Grad Students, May 3, 2002.
27. C. Espy-Wilson, "The Story of American English /r/", Vocal Tract Visualization Lab, University of Maryland Medical Division of Otolaryngology, November 1, 2002.

28. C. Espy-Wilson (2002) "Linguistically informed automatic speech recognition", First Pan-American/Iberian Meeting on Acoustics, 144th Meeting of the Acoustical Society of America, JASA, 112, p. 2278.
29. C. Espy-Wilson, "Speaker-Independent Speech Recognition Research", Ga. Tech, Digital Signal Processing Group, Feb. 2003.
30. C. Espy-Wilson, "Knowledge-based Automatic Speech Recognition," Neuroscience and Cognitive Science Program, University of Maryland, Feb. 2003.
31. C. Espy-Wilson, "Acoustic Modeling of American English /l/", MIT, Speech Communication Group, June 2003.
32. C. Espy-Wilson, "Speech: The Holy Grail of User Friendliness in Computing", TECH 2004, ISR Research Review Day, UMD, March 19, 2004.
33. C. Espy-Wilson, "Articulatory strategies, Speech Acoustics and Variability", Proc. of From Sound to Sense: 50+ Years of Discoveries in Speech Communication Conference, MIT, Cambridge, MA, pp. B-62–B76, June 11-13, 2004.
34. C, Espy-Wilson (2004) "Phonological Models of Variation in Computer Speech Processing: Commentary on the Papers by Nam, Kirchoff and Hirschberg", Carol Espy-Wilson, 9th Conference on Laboratory Phonology, University of Illinois at Urbana-Champaign.**(invited)**
35. C. Espy-Wilson, "Speech: The Holy Grail of User Friendliness in Computing", Stanford University, May 3, 2004.
36. C. Espy-Wilson, "A Probabilistic Framework for landmark detection based on acoustic phonetics for automatic speech recognition" Honda, Nov. 2004.
37. C. Espy-Wilson, "The Importance of Speech Acoustics for Speech and Speaker Recognition", UCLA, Speech Processing and Auditory Perception Lab, November 18, 2005.
38. C. Espy-Wilson, "A Probabilistic Framework for landmark detection based on acoustic phonetics for automatic speech recognition" Honda, Nov. 2005.
39. C. Espy-Wilson, "Automatic Speech Recognition" Invited tutorial at the 149th Meeting of the Acoustical Society of America, May 2005.

40. C. Espy-Wilson, "Speech-Specific Acoustic Parameters for Speaker Recognition", MIT Lincoln Laboratories, March 27, 2006.
41. C. Espy-Wilson, "The Importance of Understanding Speech Acoustics for Speech and Speaker Recognition", Center for Advanced Information Processing (CAIP), Rutgers University, March 29, 2006.
42. C. Espy-Wilson, Speech and Low Bandwidth Communication Technologies, NIH NIDCD workshop on Brain-Computer Interface Technologies, May 26-27, 2006.
43. C. Espy-Wilson and Suzanne Boyce, Separating linguistic and speaker-specific information in the acoustic signal of speech, Northwestern University, June 23, 2006.
44. C. Espy-Wilson, "Speech Production and Probabilistic Landmark-based Speech Recognition", Next-generation statistical models and inference for speech and audio processing workshop, Harvard University – Radcliffe Institute for Advanced Studies, Nov. 9-10, 2007.
45. C. Espy-Wilson, "Speech Enhancement based on the Modified Phase-Opponency Model", BU Hearing Research Center, May 9, 2008.
46. C. Espy-Wilson, Synergy of Acoustic-Phonetics and Auditory Modeling Towards Speech Enhancement, Harvard SISL Seminar, October 15, 2008.
47. C. Espy-Wilson, "Speech Enhancement based on the Modified Phase-Opponency Model", Mass. General Hospital Voice Center Research Forum, December 12, 2008.
48. C. Espy-Wilson, "Quantal Relations from the Acoustic Coupled Resonators of Sonorant Consonants", 156th Meeting of the Acoustical Society of America. Invited talk in special session honoring Ken Stevens, 2008.
49. C. Espy-Wilson, "TidyTalk, A Speech Purifier for Noisy Environments", Venture Fair, ECE

Research Review Day, October 2009.

50. C. Espy-Wilson, "Speech Technologies: Understanding and Coping with Speech Variability" Center for Language and Speech Processing at John Hopkins, Nov. 16, 2010.
51. C. Espy-Wilson, "Speech Technologies: Understanding and Coping with Speech Variability" ECE Graduate Student Association Seminar Series at UMD, Dec. 10, 2010.
52. C. Espy-Wilson, "The Wealth of Information in Speech", 2011 VAC Meeting on MultiMedia Analytics, May 2011.
53. C. Espy-Wilson, S. Boyce and A. Alwan, "How knowledge of speech acoustics can improve the robustness of automatic speech recognition, 162nd Meeting of the Acoustical Society of America, 2011.
54. C. Espy-Wilson, "Say What? Production, Perception and Variability in Speech", Distinguished Scholar-Teacher Lecture, University of Maryland, Dec. 7, 2012.
55. C. Espy-Wilson, "My Experience with being an Entrepreneur", ISR Alumni Symposium, April 2013.
56. C. Espy-Wilson, "The Invariant Property of Gestures" Presented at Speech Production in Automatic Speech Recognition, Satellite Workshop of Interspeech 2013, August 2013, Lyon, France, Invited Talk.
57. C. Espy-Wilson, Member of the Science Coalition Panel for a Senate Staff Briefing (House Energy and Commerce committee) on Sparking Economic Growth, Russell Senate Office Building Room 385, Capital Hill, Nov. 21, 2013, 2-3 pm.
58. C. Espy-Wilson, Presented at Workshop on Commercialization sponsored by the State of Maryland TEDCO Program and UM Ventures, Kim Building, Nov. 21, 2013.
59. C. Espy-Wilson, Presentation on starting OmniSpeech LLC to the Committee On Economic Development and Technology Commercialization, Maryland Board of Regents, Nov. 21, 2013
60. C. Espy-Wilson, "Speech Variability and the Possible Invariant Property of Speech Gestures", Ga. Tech, June 16, 2014.
61. C. Espy-Wilson, "Ken Steven's research and influence on automatic speech recognition", Special Session for Ken Stevens, 169th Meeting of the Acoustical Society of America, Pittsburgh, Pennsylvania, May 18-22, 2015.

Book Chapters
1. S. Nawab, C. Espy-Wilson, R. Mani, and N. Bitar (1998)"Knowledge-Based Analysis of Speech Mixed with Sporadic Environmental Sounds," Computational Auditory Scene Analysis edited by Rosenthal and Okuno Lawrence Erlbaum Associates Inc. Publishers.
2. Carol Espy-Wilson (2007), "Phonological Models of Variation in Computer Speech Processing: Commentary on the papers by Nam, Son et al.., and Hirschberg". In Cole, Jennifer and Hualde, José I. (eds.), *Laboratory Phonology 9*. Berlin: Mouton de Gruyter. pp. 535-546.
3. M. Tiede, S. Boyce and C. Espy-Wilson (2010), "Variability of North-American /r/ production in response to palatal perturbation". In Maassen, Ben and van Lieshout, Pascal (eds.), Speech Motor Control: New developments in basic and applied research, Oxford University Press.
4. C. Espy-Wilson, G. Sivaraman, M. Tiede, V. Mitra, E. Saltzmann, L. Goldstein, H. Nam (in press), "Modeling of Articulatory Gestures to Control Effects of Production Variability on Speech Technologies". In Cangemi, Clayards, Niebuhr, Schupler & Zellers (eds). Rethinking Reduction, Berlin: Mouton de Gruyter

Articles In Refereed Journals.

1. C. Y. Espy and J. Lim (1983) "Effects of Additive Noise on Signal Reconstruction from Fourier Transform Phase," IEEE Transactions on Acoustics, Speech and Signal Processing, pp. 894-898.
2. C. Y. Espy-Wilson (1992) "Acoustic Measures for Linguistic Features Distinguishing the Semivowels /wjrl/ in American English," Journal of the Acoustical Society of America, vol. 92, no. 2, pp. 736-751.
3. C. Y. Espy-Wilson (1994) "A Feature-Based Semivowel Recognition System," Journal of the Acoustical Society of America, vol. 96, no. 1, pp. 65-72.
4. V. Chari and C. Espy-Wilson (1995) "Extraction of Formant Frequencies by Adaptive Enhancement of Fourier Spectra," IEEE Transactions on Speech and Audio Processing, vol. 3, no. 1, pp. 35-39.
5. S. Boyce and C. Y. Espy-Wilson (1997) "Coarticulatory Stability in American English /r/s", Journal of the Acoustical Society of America, vol. 101, no. 6, pp. 3741-3753.
6. C. Y. Espy-Wilson, V. R. Chari, J. M. MacAuslan, C. B. Huang and M. J. Walsh (1998) "Enhancement of Electrolaryngeal Speech by Adaptive Filtering", Journal of Speech, Language and Hearing Research, vol. 41, no. 6, December, pp. 1253-1264.
7. F. Guenther, C. Espy-Wilson, S. Boyce, M. Matthies, M. Zandipour and J. Perkell (1999) "Articulatory tradeoffs reduce acoustic variability during American English /r/ production", Journal of the Acoustical Society of America, vol. 105, no. 5, pp. 2854-2865.
8. C. Y. Espy-Wilson, S. Boyce, M. Jackson, S. Narayanan and A. Alwan (2000) "Acoustic Modeling of American English /r/", Journal of the Acoustical Society of America, pp. 343-356.
9. M. Jackson, C. Espy-Wilson and S. Boyce (2001) "Verifying a vocal tract model with a closed side branch", Journal of the Acoustical Society of America, vol. 109, no. 6, pp. 2983-2987.
10. A. Salomon, C. Espy-Wilson and Om Deshmukh (2004) "Detection of Speech Landmarks: Use of Temporal Information", Journal of the Acoustical Society of America, vol. 115, no. 3, pp. 1296-1305.
11. Z. Zhang and Carol Espy-Wilson (2004) "A vocal tract model for American English /l/", Journal of the Acoustical Society of America, vol. 115, no. 3, pp. 1274-1280.
12. T. Pruthi and C. Espy-Wilson (2004) "Acoustic Parameters for Automatic Detection of Nasal Manner", Speech Communication, vol. 43, no. 3, pp.225-239.
13. O. Deshmukh, C. Espy-Wilson, A. Salomon, and Jawahar Singh (2005) "Use of Temporal Information: Detection of the Periodicity, Aperiodicity and Pitch in Speech", IEEE Transactions on Speech and Audio Processing, vol. 13, pp. 776-786.
14. O. Deshmukh, C. Espy-Wilson, L. Carney, (2007) "Speech Enhancement using the Modified Phase Opponency Model", Journal of the Acoustical Society of America, vol. 121, no. 6, pp. 3886-3898.
15. T. Pruthi, C. Espy-Wilson and Brad Story (2007) "Simulation and analysis of nasalized vowels based on MRI data", Journal of the Acoustical Society of America, vol. 121, no. 6, pp. 3858-3873.
16. A. Juneja and Carol Espy-Wilson (2008) "Probabilistic landmark detection for automatic speech recognition using acoustic-phonetic information", Journal of the Acoustical Society of America, vol. 123, no. 2, pp. 1154-1168.

17. X. Zhou, C. Espy-Wilson, S. Boyce, M. Tiede, Christy Holland and Ann Choe (2008) "A magnetic resonance imaging-based articulatory and acoustic study of "retroflex" and "bunched" American English /r/ sounds", Journal of the Acoustical Society of America, Vol. 123, no. 6, pp. 4466-4481.
18. V. Mitra, H. Nam, C. Espy-Wilson, E. Saltzman, L. Goldstein (2010) "Retrieving Tract Variables from Acoustics: a comparison of different Machine Learning strategies" IEEE

Journal of Selected Topics, vol. 4, issue 6, pp. 1027-1045.

19. V. Mitra, H. Nam, C. Espy-Wilson, E. Saltzman, L. Goldstein (2011), "Articulatory Information for Noise Robust Speech Recognition", IEEE Transactions on Audio, Speech and Language Processing, vol. 19, no. 7, pp. 1913-1924.

20. V. Mitra, H. Nam, C. Espy-Wilson, E. Saltzman, and L. Goldstein (2012) "Recognizing articulatory gestures from speech for robust speech recognition", Journal of the Acoustical Society of America, vol. 131, no. 3, pp. 2270-2287.

21. H. Nam, V. Mitra, M. Tiede, M. Hasegawa-Johnson, C. Espy-Wilson, E. Saltzman, L. Goldstein, (2012), "A procedure for estimating gestural scores from speech acoustics", Journal of the Acoustical Society of America", vol. 132, no. 6, 3980-3989.

22. X. Zhou, J. Zhou, M. Stone, J. Prince and C. Espy-Wilson (2013), "Improve vocal tract reconstruction and modeling using an image super-resolution technique", Journal of the Acoustical Society of America Express Letters, vol. 133, no. 6, pp. 439-445.

23. S. Gordon-Salant, D. Zion and C. Espy-Wilson (2014) "Recognition of time-compressed speech does not predict recognition of natural fast-rate speech by older listeners" Journal of the Acoustical Society of America, Express Letters, vol. 136, pp. 268-274.

26. Vikramjit Mitra, Ganesh Sivaraman, Hosung Nam, Carol Espy-Wilson, Elliot Saltzman, Mark Tiede, (2017) "Hybrid Convolutional Neural Networks For Articulatory And Acoustic Information Based Speech Recognition", Speech Communication, Vol 89, Issue C, pp. 103-112.

Articles In Refereed Conference Proceedings

1. C. Y. Espy and J. Lim (1982) "Effects of Noise on Signal Reconstruction from Fourier Transform Phase", Proceedings of the IEEE International Conference on Acoustics, Speech and Signal Processing, Paris, France, pp. 1833-1836.

2. C. Y. Espy-Wilson (1986) "A Phonetically Based Semivowel Recognition System", Proceedings of the IEEE International Conference on Acoustics, Speech and Signal Processing, Tokyo, Japan, pp. 2775-2778.

3. C. Y. Espy-Wilson (1987) "A Semivowel Recognition System", Programme of the Eleventh International Congress of Phonetic Sciences, Tallinn, Estonia, U.S.S.R., pp. 403-406.

4. C.Y. Espy-Wilson (1991) "Consistency in /r/ trajectories in American English", Programme of the Twelfth International Congress of Phonetic Sciences, Aix En Provence, France, pp. 370-373.

5. N. Bitar and C.Y. Espy-Wilson (1995) "A Signal Representation of Speech Based on Phonetic Features", Proc. of the IEEE Dual-Use Technologies and Applications Conference, SUNY Inst. of Tech., Utica, Rome, pp. 310-315.

6. N. Bitar and C. Y. Espy-Wilson (1995) "Speech Parameterization Based on Phonetic Features: application to speech recognition", Proc. of Eurospeech, Madrid, Spain, pp. 1411-1414.

7. N. Bitar and C. Espy-Wilson (1995) "Knowledge-Based vs. Cepstral-Based Parameters for Broad-Class HMM Speech Recognition", Proc. IEEE Workshop on Speech Recognition, Snowbird, UT, pp. 203-204.

8. N. Bitar and C.Espy-Wilson (1996) "A Knowledge-Based Signal Representation for Speech Recognition", Proc. of the ICASSP, Atlanta, GA., pp. 29-32.

9. C. Y. Espy-Wilson, V. R. Chari and C. B. Huang (1996) "Enhancement of Alaryngeal Speech by Adaptive Filtering", Proc. of the International Conference on Spoken Language Processing, Philadelphia, PA, pp. 764-767.

10. S. Boyce and C. Y. Espy-Wilson (1996) "Coarticulatory stability of American English /r/", Proc. of the International Conference on Spoken Language Processing, Philadelphia, PA, pp. 1577-1580.

11. C. Y. Espy-Wilson, S. Narayanan, S. E. Boyce and A. Alwan (1997) "Acoustic modeling of American English /r/", Proc. of Eurospeech, vo1 1., Rhodes, Greece, pp. 393-396.

12. N. Bitar and C.Y. Espy-Wilson (1997) "The Design of Acoustic Parameters for Speaker-Independent Speech Recognition", Proc. of Eurospeech, vol. 3, Rhodes, Greece, pp. 1239-1242.

13. C. Y. Espy-Wilson and S.E. Boyce (1999) "A Simple Tube Model for American English /r/", Proc. of the International Congress of Phonetic Sciences, pp. 2137-2140.

14. C. Y. Espy-Wilson, Z. McCaffrey, P. Demirel and Joel MacAuslan (1999) "Using a Natural Glottal Source to Improve Artificial Larynx Speech"," Proc. of Eurospeech, pp. 323-326.

15. A. Salomon and C. Espy-Wilson (1999) "Automatic Detection of Manner Events for a Knowledge-Based Speech Signal Representation", Proc. of Eurospeech, pp. 2797-2800.

16. A. Salomon and C. Espy-Wilson (2000) "Automatic Detection of Speech Landmarks from Temporal Cues", Proc. of International Conference on Spoken Language Processing, vol.3, pp. 762-765.

17. K. Xia and C. Espy-Wilson (2000) "A New Formant Tracking Algorithm based on Dynamic Programming", Proc. of International Conference on Spoken Language Processing, pp III55-58.

18. O. Deshmukh and Carol Espy-Wilson (2002) "Acoustic-Phonetic Speech Parameters for Speaker-Independent Speech Recognition", Proc. of the ICASSP, pp.593-596.

19. A. Juneja and C. Espy-Wilson (2002) "Segmentation of continuous speech using acoustic-phonetic parameters and statistical learning", Proc. of Conf. on Neural Info. Proc., Singapore, pp. 726-730.

20, O. Deshmukh and C Espy-Wilson (2003) "A measure of periodicity and aperiodicity in speech", Proc. of the Intern. Conf. on Acoust., Speech and Signal Proc., pp. 448-451.

21. A. Juneja and C. Espy-Wilson (2003) "Speech segmentation using probabilistic phonetic feature hierarchy and support vector machines", Proc. Intern. Joint Conf. on Neural Networks, Portland, OR pp. 675-678

22. Z. Zhang, S. Boyce, C. Espy-Wilson and M. Tiede (2003) "Acoustic Strategies for production of American English 'retroflex' /r/", Proc. of the 15th International Congress of Phonetic Science, pp. 1125-1128.

23. T. Pruthi and C. Espy-Wilson (2003) "Automatic Classification of Nasals and Semivowels", Proc. of the 15th International Congress of Phonetic Science, pp. 3061-3064.

24. A. Juneja and C. Espy-Wilson (2003) "An Event-based Acoustic- Phonetic Approach for Speech Segmentation and E-Set Recognition", Proc. 15th Intern. Congress of Phonetic Science, pp. 1333-1336.

25. O. Deshmukh and C. Espy-Wilson (2003) "Detection of periodicity and aperiodicity in speech using temporal cues", Proc. of the 15th International Congress of Phonetic Science, pp. 1365-1368.

26. Z. Zhang and C. Espy-Wilson (2003) "Acoustic Modeling of American English Lateral Approximants", Proc. of Eurospeech, pp. 2393-3296.

27. O. Deshmukh, Jawahar Singh, and Carol Espy-Wilson (2004) "A novel method for the computation of periodicity, aperiodicity and pitch of speech signals", Proceedings ICASSP, pp. I-117 – I-120.

28. A. Juneja and Carol Espy-Wilson (2004) "Significance of Invariant Acoustic Cues for Phonetic Features in a Probabilistic Framework for Landmark-Based Speech Recognition", Proceedings of From Sound to Sense: 50+ Years of Discoveries in Speech Communication Conference, MIT, Cambridge, MA, pp. C151-C156.

29. C. Espy-Wilson (2004) "Articulatory strategies, Speech Acoustics and Variability", Proc. of From Sound to Sense: 50+ Years of Discoveries in Speech Communication Conference, MIT, Cambridge, MA, pp. B-62–B76.**(invited)**

30. C, Espy-Wilson (2004) "Phonological Models of Variation in Computer Speech Processing: Commentary on the Papers by Nam, Kirchoff and Hirschberg", Carol Espy-Wilson, 9th Conference on Laboratory Phonology, University of Illinois at Urbana-Champaign.**(invited)**

31. Z. Zhang, C. Espy-Wilson, S. Boyce and M. Tiede (2005), "Modeling of the front cavity and sublingual space in American English rhotic sounds", Proc. of ICASSP. pp. pp. I-893 - I-896.

32. O. Deshmukh and C. Espy-Wilson (2005) "Speech Enhancement Using Auditory Phase Opponency Model", Proceedings of Eurospeech, Lisbon, Portugal, pp. 2117-2120.

33. S. Vishnubhotla and C. Espy-Wilson (2006), "Automatic Detection of Irregular Phonation in Continuous Speech", Proc. Interspeech 2006, pp 949-952.

34. O. Deshmukh and C. Espy-Wilson (2006), "Speech Enhancement Using Modified Phase Opponency Model", Proc. Interspeech 2006, pp. 269-272.

35. C. Espy-Wilson, S. Manocha and S. Vishnubhotla (2006), "A New Set of Features for Text-Independent Speaker Identification", Proc. Interspeech 2006, pp 1475-1478.

36. O. Deshmukh and C. Espy-Wilson (2006), "*Modified Phase Opponency Based Solution to the Speech Separation Challenge*", Proc. Interspeech 2006, Sept. 17-21, pp. 101-104.

37. T. Pruthi and C. Espy-Wilson (2006), "An MRI based Study of the Acoustic Effects of Sinus Cavities and its Application to Speaker Recognition", Proc. Interspeech 2006, pp. 2110-2113.

38. Xinhui Zhou, Carol Y. Espy-Wilson, Mark Tiede and Suzanne Boyce (2007) "An articulatory and acoustic study of 'retroflex' and 'bunched' American English rhotic sound based on MRI", Proc. Interspeech, pp. 54-57.

39. Carol Y. Espy-Wilson, Tarun Pruthi, Amit Juneja and Om Deshmukh (2007) "Landmark-based Approach to Speech Recognition: An Alternative to HMMs", Proc. Interspeech, pp. 886-889.

40. Tarun Pruthi and Carol Y. Espy-Wilson (2007) "Acoustic Parameters for the Automatic Detection of Vowel Nasalization", Proc. Interspeech, pp.1925-1928

41. Sandeep Manocha and Carol Y. Espy-Wilson (2007) "A Semi-Automatic Approach for Speaker Mining of Tapped Telephone Conversations", Proc. Interspeech, pp. 2009-2012.

42. Srikanth Vishnubhotla and Carol Espy-Wilson (2007) "Detection of Irregular Phonation in Speech", n Proc. of the Intl. Conf. on Phonetic Sciences, Saarbrucken, Aug. 6-10 2007, pp. 2053-2056

43. Vikramjit. Mitra, D. Garcia-Romero, C. Espy-Wilson (2008) "Language Detection in Audio Content Analysis", Proceedings of IEEE Intl. Conference on Acoustics, Speech and Signal processing, ICASSP'08, pp. 2109-2112..

44. Vikramjit Mitra, Daniel Garcia-Romero and Carol Espy-Wilson (2008), "Language and Genre Detection in Audio Content Analysis", Proc. Interspeech, pp. 2506-2509.

45. Daniel Garcia-Romero and Carol Espy-Wilson (2008) "Intersession Variability in Speaker Recognition: A behind the Scene Analysis", Proc. Interspeech, pp. 1413-1416.

46. Srikanth Vishnubhotla and Carol Espy-Wilson, (2008) "An Algorithm for Multi-Pitch Tracking in Co-Channel Speech, Proc. Interspeech, pp.143-146

47. Srikanth Vishnubhotla and Carol Espy-Wilson (2009), "An Algorithm for Speech Segregation of Co-Channel Speech", Proc. of the IEEE Intern. Conf. on Acoust., Speech and Sig. Proc., pp. 109 – 112.

48. Vikramjit Mitra, I Yucel Ozbek, Hosung Nam, Xinhui Zhou and Carol Espy-Wilson(2009) "From Acoustics to Vocal Tract Time Functions", Proc. of the IEEE Intern. Conf. on Acoust., Speech and Sig. Proc., pp. 4497 - 4500, April 2009.

49. Vikramjit Mitra, Bengt J. Borgstrom, Carol Y. Espy-Wilson, and Abeer Alwan (2009) "A Noise-type and level-dependent MPO-based speech enhancement architecture with variable frame analysis for noise-robust speech recognition" Proc. Interspeech.

50. Vikramjit Mitra, Hosung Nam, Carol Espy-Wilson, Elliot Saltzman, and Louis Goldstein (2009) "Noise Robustness of Tract Variables and their Application to Speech Recognition, Proc. Interspeech**.**

51. D. Garcia-Romero and C. Espy-Wilson, "Automatic Acquisition Device Identification From Speech Recordings" Proceedings of ICASSP 2010.

52. X. Zhou, C.Y. Espy-Wilson, M. Tiede, S. Boyce, "An MRI-based articulatory and acoustic study of lateral sound in American English", Proceedings of ICASSP 2010.

53. V. Mitra, H. Nam, C. Espy-Wilson, E. Saltzman, L. Goldstein, Robust Word Recognition using articulatory trajectories and Gestures, Proc. of Interspeech, pp. 2038-2041 Japan, 2010.

54. H. Nam, V. Mitra, M. Tiede, E. Saltzman, L. Goldstein, C. Espy-Wilson, M. Hasegawa-Johnson, A procedure for estimating gestural scores from natural speech, Proc. of Interspeech, pp. 30-33, Japan, 2010.

55. V. Mahadevan and C. Espy-Wilson, "Maximum Likelihood Pitch Estimation Using Sinusoidal Modeling, Proceedings of the International Conference on Communications and Signal Processing, 2011.

56. V. Mitra, H. Nam, C. Espy-Wilson, E. Saltzman, L. Goldstein, "Gesture-based Dynamic Bayesian Network for Noise robust Speech Recognition" , Proceedings of ICASSP 2011.

57. V. Mitra, H. Nam, C. Espy-Wilson, E. Saltzman, L. Goldstein, "Speech Inversion: Benefits of Tract Variables over Pellet Trajectories", Proceedings of ICASSP 2011.

58. X. Zhou, M. Stone and C. Espy-Wilson, "A comparative acoustic study on speech of glossectomy patients and normal subjects", Interspeech 2011, pp.517-520.

59. D. Garcia-Romero and C. Espy-Wilson, "Analysis of I-vector Length Normalization in Speaker Recognition Systems", Interspeech 2011, pp. 249-252.

60. J. Zhou, D. Garcia-Romero, and C. Espy-Wilson, "Automatic Speech Codec Identification with Applications to Tampering Detection of Speech Recordings", Proceedings of Interspeech 2011, pp. 2533-2536.

61. V. Mitra, H. Nam and C. Espy-Wilson, "Robust speech recognition using articulatory gestures
in a Dynamic Bayesian Network framework, Automatic Speech Recognition and Understanding Workshop, Dec. 2011, Hawaii.

62. X. Zhou, D. Garcia-Romero, R. Duraiswami, C. Espy-Wilson and S. Shamma, "Linear versus Mel- Frequency Cepstral Coefficients for Speaker Recognition" Automatic Speech Recognition and Understanding Workshop, Dec. 2011, Hawaii.

64. D. Garcia-Romero, X. Zhou and C. Espy-Wilson, "Multicondition Training of Gaussian PLDA Models In I-Vector Space For Noise And Reverberation Robust Speaker Recognition, Proceedings of ICASSP 2012.

65. X. Zhou, D. Garcia-Romero, N. Mesgarani, M. Stone, C. Espy-Wilson and S. Shamma "Automatic intelligibility assessment of pathologic speech in head and neck cancer based on auditory-inspired spectro-temporal modulations", Proc. of Interspeech, September 2012.

66. X. Zhou, J. Woo, M. Stone and C. Espy-Wilson, "A Cine Mri-Based Study Of Sibilant Fricatives Production In Post-Glossectomy Speakers", Proceedings of ICASSP 2013, pp. 7780-7784.

67. G. Sivaraman, V. Mitra and C. Espy-Wilson, "Fusion Of Acoustic, Perceptual And Production Features For Robust Speech Recognition In Highly Non-Stationary Noise" presented at the CHIME Challenge, ICASSP 2013.

68. D. Zion, C. Espy-Wilson, S. Gordon-Salant, "Recognition of natural-rate, time-compressed, and natural fast-rate sentences by younger and older listeners", presented at the Aging and Speech Communication Conference, 5th International and Interdisciplinary Research Conference, Indiana University, Bloomington, October 6-9, 2013.

69. V. Mitra, G. Sivaraman, H. Nam, C. Espy-Wilson, E. Saltzman, "Articulatory features from deep neural networks and their role in speech recognition" Proceedings of ICASSSP 2014.

70. G. Sivaraman, V. Mitra, M. Tiede, E. Saltzman, L. Goldstein and C. Espy-Wilson, "Analysis of coarticulated speech using estimated articulatory trajectories", Interspeech, 2015.

71. V. Mitra, W. Wang, Y. Lei, A. Kathol, G. Sivaraman and C. Espy-Wilson, "Robust features

and system fusion for reverberation and their role in speech recognition", ICASSP, 2015.

72. S.Sahu, C.Espy-Wilson, "Speech features for depression detection", In Proceedings of Interspeech Sept. 2016. pp. 1928-1932.
73. G. Sivaraman, V.Mitra, H. Nam, M.K. Tiede, C. Espy-Wilson (2016) Vocal tract length normalization for speaker independent acoustic-to-articulatory speech inversion, Proc. of INTERSPEECH 2016.
74. S. Sahu,S. R. Gupta, G. Sivaraman, W. AbdAlmageed, and C. Espy-Wilson, "Adversarial auto-encoders for speech based emotion recognition," in Interspeech, 2017, pp. 1243–1247.
75. Rahul Gupta, Saurabh Sahu, Carol Espy-Wilson, and Shrikanth Narayanan. An Affect Prediction Approach through Depression Severity Parameter Incorporation in Neural Networks. In *In Proceedings of Interspeech*, August 2017.
76. R. Gupta, S. Sahu, C. Espy-Wilson and S. Naryanan, "Semi-supervised and Transfer learning approaches for low resource sentiment classification," to be presented at ICASSP 2018.
77. S. Sahu, R. Gupta, G. Sivaraman, and C. Espy-Wilson, "Smoothing Model predictions Using Adversarial Training Procedures for Speech based Emotion Recognition," to be presented at ICASSP 2018.

Published Abstracts
63 Abstracts published in JASA

Patents
1. J. MacAuslen, V. Chari, R. Goldhor and C. Espy-Wilson, "Electrolaryngeal Speech Enhancement for Telephony", U.S. Patent 6975984 B2, Issued Dec. 13, 2005.
2. C. Espy-Wilson, "Process to Introduce Realistic Pitch Variation in Artificial Larynx Speech", U.S. Patent 6,359.988 B1, Issued March 19, 2002.
3. C. Espy-Wilson and A. Juneja, "A Probabilistic Acoustic-Phonetic Approach to Automatic Speech Recognition" US Patent 7,666,642, Issued February 16, 2010.
4. C. Espy-Wilson and Srikanth Vishnuhotla, Systems and Methods for Speech Extraction, nonprovisional filed Jan. 31, 2011.
5. C. Espy-Wilson and Srikanth Vishnuhotla, "Systems and Methods for Multipitch Tracking", US Patent 8,666,734, issued March 4, 2014.
6. Srikanth Vishnubhotla and C. Espy-Wilson, "Systems and Methods For Speech Extraction", US Patent 9,886,967, will be issued Feb. 6, 2018

Contracts And Grants
Prof. Espy-Wilson has raised over $5M (her portion) in grants for her students and lab primarily from NSF and NIH.