

Abeer Alwan

Department of Electrical and Computer Engineering UCLA

alwan@ee.ucla.edu

Education: [SEP]

MIT, EECS, Eng. (1987) Sc.D. (1992)

Northeastern University, BSEE with highest honors, (1983)

Awards, Honors, and Special Recognition

- Chair, ISCA Distinguished Lecturer Committee, 2019-present
- Elected Member, IEEE Signal Processing Board of Governors, 2017-2020
- Distinguished Engineering Educator Award, Engineer's Council, 2017
- Co-Chair, Interspeech Special Sessions Committee, 2016
- Elected Member, ISCA Advisory Council, 2015-2018
- Member and Vice Chair, IEEE Awards Board Review Committee, 2011-2015
- Fellow, International Speech Communication Association (ISCA), 2011
- Fellow, IEEE Signal Processing Society, 2008
- Fellow, Acoustical Society of America, 2003
- Fellow, Radcliffe Institute for Advanced Study (RIAS), Harvard University, 2006
- ISCA Distinguished Lecturer (2009-2011)
- Keynote Speaker, Interspeech 2008, Brisbane, Australia
- Chair, IEEE James L. Flanagan Speech and Audio Signal Processing Award Committee, 2008-2010

- Okawa Foundation Award in Telecommunications, 1997
- NSF Career Development Award, 1995-1998
- UCLA-TRW Excellence in Teaching Award, 1994
- NIH FIRST Career Development Award, 1994-1999
- NSF Research Initiation Award, 1993-1996
- Elected member: New York Academy of Sciences, Eta Kappa Nu, Outstanding Women of America, Sigma Xi, Tau Beta Pi, IEEE Signal Processing Technical Committees on Speech Processing (2011- 2013), and Audio and Electroacoustics (1996-1999).

Editorial Service:

- Associate Editor, Journal of the Acoustical Society of America, 2009-2015
- Associate Editor, IEEE Tran. Audio, Speech, and Language Processing, 2006-2009
- Editor-in-Chief, Speech Communication, 2000-2003
- Member of the Editorial Boards of Speech Communication, since 2000, and Frontiers in Signal Processing since 2006

Academic Experience:

UCLA, Department of Electrical and Computer Engineering

1992-1996: Assistant Prof., 1996-2000: Associate Prof., 2000-present: Full Prof.; 2015-present: Vice Chair, Undergraduate Affairs

UCLA, Biomedical Engineering (BME), Graduate Interdepart. Program (IDP)

1997-1999: Member of the Faculty Advisory Committee for the BME IDP, and Chair of the Bioacoustics, Speech and Hearing Area within the BME Program. 1999-2001: Vice Chair of the BME IDP.

Massachusetts Institute of Technology, Cambridge, MA Department of Electrical Engineering and Computer Science

1983-1992: Research Assistant, and Teaching Assistant for a graduate course and three undergraduate courses. [L] [SEP] 2006-2007: Visiting Scientist. [L] [SEP]

Industrial Experience

1993-present: [L] [SEP] Consultant for several companies on speech synthesis and recognition.

Selected Invited Talks and Participations

- Invited lectures in academic and industrial research labs including: AT&T, UT Austin, BU, Cal. Tech., Stanford U., Purdue U., U. Illinois Urbana-Champaign, UCSB, JHU, UCB, USC, Rockwell, ASA-LA and Boston Chapters, ACM-LA Chapter, Tufts, MIT Colloquia, UC Berkeley, Google, SRI, ICSI, Fed. U. of Rio de Janeiro and Uni. Camp. (Brazil), K.U. Leuven (Belgium), UK Speech (UK), UC Merced Mind and Society Colloquium, Harvard EECS Colloquium, National Symposium for the Advancement of Women in Science,
- Invited Keynote Speaker, Interspeech 2008, Brisbane, Australia
- Invited Speaker, AFOSR-sponsored workshop on “Speech Separation and Comprehension in Complex Acoustic Environments”, Montreal, Canada, Nov. 2004
- Member, IEEE James L. Flanagan Speech and Audio Signal Processing Award Committee, 2003-2004, and 2007-2008; Chair: 2008-2010
- Appointed expert member to the appointments board concerning a Professorship in Signal Processing, Lund Institute of Technology, Sweden, 1997
- Invited panelist at a COSEPUP (Committee on Science, Engineering, and Public Policy, of the National Academy of Sciences, Engineering, and Institute of Medicine) meeting, 1996. Based on the panelists’ presentations, a report was written and published in ‘Capitalizing on Investments in Science and Technology,’ National Academy Press, 1999
- Invited participant at several NSF panels and workshops (Directorates of Computer and Information Science and Engineering, and Education and Human Resources), and an NIH panel, 1995-present [L] [SEP]

Selected Journal Publications (last 10 years)

1. Parga, Lewin, Lewis, Montoya-Williams, Alwan, Shaul, Han, Bookheimer, Eyer, Dapretto, Zeltzer, Dunlap, Nookala, Sun, Dang, Anderson, ["Defining and Distinguishing Infant Behavioral States Using Acoustic Cry Analysis: Is Colic Painful?"](#), Pediatric Research, volume 87, pages 576–580, 2020
2. Guo, ...and Alwan ["Deep neural network based i-vector mapping for speaker verification using short utterances"](#), Speech Communication (SC), vol. 105, 92-102, 2018
3. Yeung, Lulich, Guo, Sommers, Alwan ["Subglottal resonances of American English speaking children"](#), The Journal of the Acoustical Society of America (JASA) 144, 3437-3449, 2018
4. Park, Yeung, Vesselinova, Kreiman, Keating, Alwan ["Understanding Speaker Discrimination Abilities in Humans and Machines for Text-Independent Short Utterances of Different Speech Styles"](#), JASA, 144, 375-386, 2018
5. Guo, Yang, Arsikere, Alwan, ["Robust speaker identification via fusion of subglottal resonances and cepstral features"](#), JASA, 141, EL420, 2017
6. Kaewtip, Alwan, O'Reilly, Taylor, [A robust automatic birdsong phrase classification: A template-based approach](#), JASA, 140, 3691-3701, 2017
7. Tan, Alwan, Kossan, Cody, Taylor, "Dynamic time warping and sparse representation classification for birdsong phrase classification using limited training data", JASA, 137, pp. 1069-1080, 2015
8. Kreiman, Garellek, Chen, Alwan, Gerratt, Perceptual evaluation of voice source models, JASA, Vol. 138, pp. 1 – 10, 2015
9. Chen, Kreiman, Alwan, "The glottal topogram: a method of analyzing high-speed images of the vocal folds", Computer Speech and Language (CSL) 28, pp. 1156-1169, 2014
10. Drugman, Alku, Alwan, Yegnanarayana, "Glottal Source Processing: from Analysis to Applications", Special Issue on Glottal Source Processing, CSL 28, pp. 1117-1138, 2014
11. Arsikere, Lulich, Alwan, "Estimating Speaker Height and Subglottal Resonances Using MFCCs and GMMs," IEEE Signal Processing Letters, Vol 21, pp. 159–162,

2013

12. Tan, Alwan, "Multi-Band Summary Correlogram-based Pitch Detection for Noisy Speech", SC, Vol 55, pp. 841-856, 2013
13. Chen, Kreiman, Gerratt, Neubauer, Shue, Alwan, "Development of a glottal area index that integrates glottal gap size and open quotient," JASAVol 133, pp. 1656-1666, 2013
14. Arsikere, Leung, Lulich, Alwan, "Automatic estimation of the first three subglottal resonances from adults speech signals with application to speaker height estimation," SC, Vol 55, pp. 51-70, 2013
15. Chu, Alwan, "SAFE: A Statistical Approach to F0 Estimation under Clean and Noisy Conditions," IEEE Trans. on Audio, Speech, and Language Processing, Vol 20, No. 3, pp. 933 - 944, 2012
16. Lulich, Morton, Arsikere, Sommers, Leung, Alwan, "Subglottal resonances of adult male and female native speakers of American English," JASA, Vol 132, pp. 2592-2602, 2012
17. Kreiman, Shue, Chen, Iseli, Gerratt, Neubauer, Alwan, "Relationships among voice quality, harmonic amplitudes, open quotient, and glottal area waveform shape in sustained phonation," JASA, Vol 132, pp. 2625 -2632, 2012
18. Lulich, Alwan, Arsikere, Morton, Sommers, "Resonances and wave propagation velocity in the subglottal airways", JASA, Vol 130, pp. 2108-2115, 2011
19. Borgstrom and Alwan, "A Unified Framework for Designing Optimal STSA Estimators Assuming Additive Superposition of Speech and Noise", IEEE Trans. on Audio, Speech, and Language Processing (TASLP), Vol 19, pp. 2579 – 2590, 2011
20. Arsikere, Lulich, Alwan, "Automatic Estimation of the First Subglottal Resonance," JASA Letters, Vol 129, pp. 197-203, 2011
21. Alwan, Jiang, Chen, "Perception of place of articulation for plosives and fricatives in noise," SC, 53, Issue 2, pp. 195-209, 2011
22. Panchapagesan and Alwan, "A study of acoustic-to-articulatory inversion of speech by analysis-by-synthesis using chain matrices and the Maeda articulatory model,"

JASA, Vol 129, pp. 2144-2162, 2011

23. Tepperman, Lee, Narayanan, and Alwan, "A Generative Student Model for Scoring Word Reading Skills," IEEE TASLP, Vol 19, No. 2, 2011
24. Borgstrom and Alwan, "A Statistical Approach to Mel-Domain Mask Estimation for Missing-Feature ASR", IEEE Signal Processing Letters, Vol 17, pp. 941-944, 2010
25. Borgstrom and Alwan, "HMM-Based Reconstruction of Unreliable Spectrographic Data for Noise Robust Speech Recognition", IEEE TASLP, Vol 18, No. 5, 2010
26. Borgstrom and Alwan, "Improved Speech Presence Probabilities Using HMM-Based Inference, with Applications to Speech Enhancement and ASR," Journal of Selected Topics in Signal Processing, Vol 4, pp. 808-815, 2010.
27. Shue, ...&Alwan , "On the acoustic correlates of high and low nuclear pitch accents in American English," SC, Vol 52, pp. 106-122, 2010

Edited Books

1. Narayanan and Alwan (Ed.), "Text to Speech Synthesis: New Paradigms and Advances", Prentice Hall, 2004
2. Alwan, Ortega, Kuo, Nikias, Wah Wong (Ed.), "IEEE Second Workshop on Multimedia Signal Processing," IEEE Press, 1998

Book Chapters

1. Mitra, Franco, Sternvan Hout, Ferrer, Garciarena, Wang, Vergyri, Alwan, Hansen, "Robust Features in Deep-Learning-Based Speech Recognition" a chapter in the book: New Era for Robust Speech Recognition: Exploiting Deep Learning Editors: Watanabe, Delcroix, Metze, Hershey. Springer, 2017
2. Borgstrom, Bernard, Alwan, " Error Recovery - Channel Coding and Packetization," Chapter 8 in Automatic Speech Recognition on Mobile Devices and over Communication Networks, Springer-Verlag. Eds: Tan and Lindberg, pp. 163-185, 2008.
3. Hasegawa-Johnson and Alwan, "Speech Coding: Fundamentals and Applications," the Wiley Encyclopedia of Telecommunications, Editor: Proakis, 2002, Vol. 5, pp.

2340-2359.

4. Strobe and Alwan, "Modeling the Perception of Pitch-Rate Amplitude Modulation in Noise, in "Computational Models of Auditory Function", Greenberg and Slaney ed., p. 315-327, NATO Science Series, 2001
5. Alwan et al., "Analysis by synthesis of pathological voices," Voice Quality Measurement, R. Kent ed., p. 307-335, Singular Publishing, 1999

Selected Peer-Reviewed Conference Proceedings (last 10 years)

1. Vijay Ravi, Ruchao Fan, Amber Afshan, Huanhua Lu, and Abeer Alwan, ["Exploring the Use of an Unsupervised Autoregressive Model as a Shared Encoder for Text-Dependent Speaker Verification"](#), Interspeech 2020.
2. Amber Afshan, Jody Kreiman, and Abeer Alwan, ["Speaker discrimination in humans and machines: Effects of speaking style variability"](#), Interspeech 2020.
3. Amber Afshan, Jinxi Guo, Soo Jin Park, Vijay Ravi, Alan McCree, and Abeer Alwan, ["Variable frame rate-based data augmentation to handle speaking-style variability for automatic speaker verification"](#), Interspeech 2020.
4. Yeung, Bailey, Afshan, Tinkler, Pérez, Martin, Pogossian, Spaulding, Park, Muco, Alwan and Breazeal, ["A robotic interface for the administration of language, literacy, and speech pathology assessments for children"](#), SLATE 2019
5. G. Yeung, and A. Alwan ["A Frequency Normalization Technique for Kindergarten Speech Recognition Inspired by the Role of F0 in Vowel Perception"](#), Interspeech 2019
6. V. Ravi, S. Park, A. Afshan, and A. Alwan ["Voice Quality and Between-Frame Entropy for Sleepiness Estimation"](#), Interspeech 2019, pp. 2408-2412.
7. Yeung, Bailey, Afshan, Pérez, Martin, Spaulding, Park, Alwan and Breazeal ["Towards the Development of Personalized Learning Companion Robots for Early Speech and Language Assessment"](#), AERA 2019
8. S. Park, Amber Afshan, J. Kreiman, G. Yeung and Alwan ["Target and Non-target Speaker Discrimination by Humans and Machines"](#), ICASSP 2019

9. Yeung and Alwan ["On the Difficulties of Automatic Speech Recognition for Kindergarten-Aged Children"](#), Interspeech 2018
10. Guo, Xu, Chen, Shi, Xu, Alwan "Filter Sampling and Combination CNN (FSC-CNN): a Compact CNN Model for Small-footprint ASR Acoustic Modeling Using Raw Waveforms", Interspeech 2018
11. Park, Afshan, Chua, Alwan ["Using Voice Quality Supervectors for Affect Identification"](#), Interspeech 2018
12. Yeung, Afshan, Ozgun, Kaewtip, Lulich, Alwan, "Predicting Clinical Evaluations of Children's Speech with Limited Data Using Exemplar Word Template References", SLATE 2017
13. Guo, Xu, Li, Alwan, "Attention based CLDNNs for short-duration acoustic scene classification", Interspeech 2017
14. Guo, Nookala, Alwan, "CNN-based joint mapping of short and long utterance i-vectors for speaker verification using short utterances" , Interspeech 2017
15. Park, Yeung, Kreiman, Keating, Alwan, ["Using Voice Quality Features to Improve Short-Utterance Text-Independent Speaker Verification,"](#) Interspeech 2017
16. Jin, Sigouin, Kreiman, Keating, Guo, Yeung, Kuo, and Alwan, Speaker Identity and Voice Quality: Modeling Human Responses and Automatic Speaker Recognition, Interspeech 2016
17. Mitra, VanHout, Franco... & Alwan. Fusion Strategies for Robust Speech Recognition and Keyword Spotting for Channel-and Noise-Degraded Speech, Interspeech 2016
18. Kaewtip, Taylor, & Alwan Noise-Robust Hidden Markov Models for Limited Training Data for Within-Species Bird Phrase Classification, Interspeech 2016
19. Guo, Yeung, Muralidharan, Arsikere, Afshan, & Alwan. Speaker Verification Using Short Utterances with DNN-Based Estimation of Subglottal Acoustic Features, Interspeech 2016
20. Guo, Paturi, Yeung, Lulich, Arsikere, & Alwan, "Age-dependent height estimation and speaker normalization for children's resonances," Interspeech 2015

21. Park, Sigouin, Kreiman, Keating, Guo, Yeung, Kuo, and Alwan [Speaker Identity and Voice Quality: Modeling Human Responses and Automatic Speaker Recognition](#), Interspeech 2016
22. Mitra, VanHout, Want, Bartels, Franco, Vergyri, Alwan, "Fusion Strategies for Robust Speech Recognition and Keyword Spotting for Channel-and Noise-degraded Speech, Interspeech 2016
23. Kreiman, Park, Keating, & Alwan, "The Relationship Between Acoustic and Perceived Intraspeaker Variability in Voice Quality." Interspeech 2015
24. Kaewtip, Tan, Alwan, and Taylor, "Bird- Phase Segmentation and Verification: a Noise Robust Template-Based Approach". ICASSP 2015
25. Chen, Park, Kreiman, Alwan, "Investigating the effect of F0 and vocal intensity on harmonic magnitudes: Data from high-speed laryngeal videoendoscopy", Interspeech 2014
26. Arsikere, Gupta, Alwan, "Speaker recognition via fusion of subglottal features and MFCCs", Interspeech 2014
27. Tan and Alwan, "Feature Enhancement Using Sparse Reference and Estimated Soft-Mask Exemplar Pairs for Noisy Speech Recognition", ICASSP 2014
28. Kaewtip, Tan, Alwan, "A Pitch-Based Spectral Enhancement Technique for Robust Speech Processing", Interspeech 2013.
29. K. Kaewtip, L. Tan, A. Alwan, C. Taylor, "A robust automatic bird phrase classifier using dynamic time-warping with prominent region identification", ICASSP 2013,
30. Arsikere, Lulich and Alwan, "Non-linear frequency warping for VTLN using subglottal resonances and the third formant frequency," ICASSP 2013
31. Tan, Kossan, Cody, Taylor, Alwan, "A Sparse Representation- based Classifier for In-set Bird Phrase Verification and Classification with Limited Training Data," ICASSP 2013
32. Chu and Alwan, "FBEM: A Filter Bank EM Algorithm for the Joint Optimization Of Features and Acoustic Model Parameters In Bird Call Classification", ICASSP 2012

33. Chen, Kreiman, and Alwan, "The Glottal-topograph: A Method of Analyzing High-Speed Images of the Vocal Folds", ICASSP 2012
34. Arsikere, Leung, Lulich and Alwan, "Automatic height estimation using the second subglottal resonance", ICASSP 2012
35. van Hout and Alwan, "A Novel Approach to Soft-Mask Estimation and Log-Spectral Enhancement For Robust Speech Recognition", ICASSP 2012
36. Tan and Alwan, "Noise-Robust F0 Estimation Using SNR- Weighted Summary Correlograms From Multi-Band Comb Filters," ICASSP 2011
37. Arsikere, Lulich, Alwan, "Automatic Estimation of the Second Subglottal Resonance from Natural Speech," ICASSP 2011
38. Borgstrom and Alwan, "Log-Spectral Amplitude Estimation With Generalized Gamma Distributions For Speech Enhancement," ICASSP 2011
39. Shue, Chen, Alwan, "On the Interdependencies between Voice Quality, Glottal Gaps, and Voice-Source related Acoustic Measures," Interspeech 2010

Supervised: 30 PhD, 32 Master's, and 30 undergraduate students.

Grants and Contracts: More than 8 million dollars from NSF, NIH, DARPA, ARPA, and industry.