

MARI OSTENDORF

Professor

Department of Electrical Engineering
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SPECIALIZATION:

Statistical modeling for signal interpretation and synthesis in speech and language processing. Current research efforts are in acoustic and language modeling for spoken document processing, computational models of prosody at the interface of speech and language processing, semi-supervised learning and domain transfer, and language technology for educational applications.

EDUCATION:

Stanford University, Department of Electrical Engineering

Bachelor of Science Degree, 1980

Master of Science Degree, 1981

Doctoral Degree, 1985

Dissertation: Finite-State Vector Quantization for Low Rate Speech Coding

Thesis Supervisor: Prof. Robert M. Gray

EMPLOYMENT:

- 1999 – present **University of Washington**, Seattle, WA 98195
Professor, Electrical Engineering, 1999 – present.
Assoc. Dean for Research and Graduate Studies, College of Engineering, 2009 – 2012
Assoc. Chair for Research, Electrical Engineering, 2001 – 2003.
Adjunct Professor of Linguistics, 2001 – present.
Adjunct Professor of Computer Science, 2002 – present.
- 2005 – 2006 **University of Karlsruhe**, Karlsruhe, Germany
Visiting Professor.
- 1987 – 1999 **Boston University**, Boston, MA 02215
Professor, 1999.
Associate Professor, 1993 – 1999.
Assistant Professor, 1987 – 1993.
- 1995 **ATR Interpreting Telecommunications Laboratories**, Kyoto, Japan
Visiting Researcher.
- 1985 – 1986 **BBN Laboratories, Inc.**, Cambridge, MA 02138
Scientist.
- 1981 – 1984 **Stanford University**, Stanford, CA 94305
Research Assistant.
- 1980 – 1981 **Bell Telephone Laboratories**, North Andover, MA 01845
Member of Technical Staff.

PROFESSIONAL ACTIVITIES:

• Advisory Committees

- Advisory Board, Human Language Technology Center of Excellence, Johns Hopkins University, 2010 - 2011
- External reviewer, China-Singapore Institute of Digital Media, 2011
- External reviewer, University of Sheffield Computer Science Department review, 2005
- Review Panel for the NCCR (IM)2, Swiss National Science Foundation, 2002 - 2006
- DARPA Spoken Language Research Coordinating Committee, 1993 – 1994
- DARPA ISAT Study Group on Multilingual Text and Speech Systems, 1992
- Advisory Committee for Information, Robotics and Intelligent Systems (IRIS) Program, Computer and Information Science and Engineering (CISE) Division of the National Science Foundation. (1989 - 1991, appointed by the IRIS director)

• Editorial Roles

- *IEEE Trans. on Audio, Speech and Language Processing*, Editor-in-Chief, 2006 – 2008
- *IEEE Trans. on Speech and Audio Processing*, Associate Editor, 2005
- *Computational Linguistics*, Editorial Board, 2005 – 2007.
- *Computer Speech and Language*, US Editor, 1998 – 2003; Editorial Board, 1993 – 2005.

• Selected Society Committee Service

- IEEE Signal Processing Society VP Publications (2012-2014)
- IEEE Signal Processing Society Board of Governors (2009-2011)
- IEEE Kilby Award Committee, 2009-2010
- IEEE Signal Processing Society Awards Committee, 2008
- IEEE Signal Processing Society, Speech Processing Technical Committee (1990-1993)
- IEEE Signal Processing Society, DSP Education Committee (1992 - 1993)
- ISCA Advisory Council, 2006 – 2012
- ISCA Distinguished Lecturer Committee, 2010
- ASA Speech Technical Committee, 1996-1999

• Selected Workshop Service

- Co-chair, 2010 IEEE Workshop on Spoken Language Technology
- General Chair, 2009 NAACL Human Language Technologies Conference
- Area Chair, Speech and Language Processing, 2008 EMNLP Conference
- Scientific Committee, Interspeech 2007-2010
- Technical Committee, ACL Workshop on Language Technology in Educational Applications 2008-2011
- Scientific Committee, 2006 IEEE/ACL Workshop on Spoken Language Technology
- Scientific Committee, 2006 International Conference on Speech Prosody
- North-American liaison, Interspeech 2005 (with N. Morgan)
- Co-chair, 2003 NAACL Human Language Technologies Conference
- ICSLP Standing Committee, 2001 – 2004
- Co-chair, 2001 ISCA Workshop on Prosody and Speech Recognition
- Co-chair, 2000 DARPA Workshop on Corpus-Based Text Generation and Synthesis
- Co-chair, 2000 IMA Workshop on Mathematical Foundations of Speech Processing and Recognition
- Chair, 1998 NSF Workshop for Discussing Research Priorities and Evaluation Strategies in Speech Synthesis
- Group Leader at the 1996 DoD workshop on continuous speech recognition at Johns Hopkins University

HONORS/AWARDS:

- IEEE Hewlett-Packard/Harriett B. Rigas Award, 2010
- Fellow, International Speech Communication Association, 2008
- Fellow, IEEE, 2005
- 2008 University of Washington College of Engineering Faculty Research Innovator Award
- 2007 University of Washington Electrical Engineering Department Faculty Service Award
- 1999 – present, Endowed Professor in System Design Methodologies
- 1999 IEEE Signal Processing Society Paper Award (Ostendorf, Digalakis and Kimball, 1996)
- 1998 ATR Interpreting Telecommunications Laboratories Paper Award (Ostendorf and Singer, 1997)
- Member, Sigma Xi

TEACHING EXPERIENCE:

- Undergraduate Level
 - Fundamentals of EE (Basic Circuit Theory)
 - Introduction to Probability and Statistics
 - Continuous- and Discrete-time Linear Systems
 - The Digital World of Multimedia
(a design-oriented early introduction to signal processing and communications)
- Graduate Level
 - Stochastic Processes
 - Introduction to Statistical Learning (or, Statistical Pattern Recognition)
 - Spectral Estimation and Modeling
 - Statistical Language Processing
- Professional Society Courses
 - Computational Extraction of Social and Interactional Meaning from Speech (Linguistics Institute 2011, with D. Jurafsky)

PUBLICATIONS:

Publications are listed by main areas of research. Journal publications are indexed with *, invited papers and book chapters with +, and conference papers with •. Reprints of papers appearing in book compilations are noted by those papers.

Low Rate Coding

- S. Roucos and M. Ostendorf Dunham, “A Comparison of Two Methods for Very-Low-Rate Speech Coding,” *Proc. of the Milcom Conference*, Boston, MA, October 1985.
- * J. Foster, R. M. Gray and M. Ostendorf Dunham, “Finite-State Vector Quantization for Waveform Coding,” *IEEE Transactions on Information Theory*, May 1985, pp. 348-359. (A reprint appears in *Vector Quantization*, ed. H. Abut, IEEE Press 1990.)

- * M. Ostendorf Dunham and R. M. Gray, “An Algorithm for the Design of Labeled-Transition Finite-State Vector Quantizers,” *IEEE Transactions on Communications*, January 1985, pp. 83-89.

Acoustic Modeling for Speech Recognition

- * A. Mandal, M. Ostendorf and A. Stolcke, “Improved Robustness of MLLR adaptation with Speaker-Clustered Regression Class Trees,” *Computer Speech and Language*, Vol. 23, No. 2, pp.176-199, 2009.
- * T. Shinozaki and M. Ostendorf, “Cross-validation and aggregated EM training for robust parameter estimation,” *Computer Speech and Language*, Vol. 22, No. 2, pp. 185-195, 2008.
- S. Otterson and M. Ostendorf, “Efficient use of overlap information in speaker diarization,” *Proc. ASRU*, pp. 683-686, December 2007.
- G. Peng, M.-Y. Hwang and M. Ostendorf, “Acoustic segmentation for speech recognition on broadcast recordings,” *Proc. Interspeech*, pp. 2977-2980, 2007
- X. Lei and M. Ostendorf, “Word-level tone modeling for Mandarin speech recognition,” *Proc. ICASSP*, pp. IV-665-668, 2007
- T. Shinozaki and M. Ostendorf, “Cross-validation EM training for robust parameter estimation,” *Proc. ICASSP*, pp. IV-437-440, 2007.
- * R. Bates, M. Ostendorf and R. Wright, “Symbolic phonetic features for modeling of pronunciation variation,” *Speech Communication*, Vol. 49, No. 2, pp. 83-97, 2007.
- A. Mandal, M. Ostendorf and A. Stolcke, “Speaker clustered regression-class trees for MLLR adaptation,” *Proc. Interspeech*, September 2006, pp. 1133-1136.
- X. Lei, M. Siu, M.-Y. Hwang, M. Ostendorf and T. Lee, “Improved tone modeling for Mandarin Broadcast News,” *Proc. Interspeech*, September 2006, pp. 1237-1240.
- * M. Siu, T. Ng, and M. Ostendorf, “A quantitative assessment of the importance of tone in Mandarin speech recognition,” *Signal Processing Letters*, Vol. 12, No. 12, pp. 867-870, 2005.
- D. Hillard and M. Ostendorf, “Compensating for word posterior estimation bias in confusion networks,” *Proc. International Conference on Acoustics, Speech and Language Processing*, Vol. I, pp. 1153-1156, 2006.
- * with N. Morgan *et al.*, “Pushing the envelope – aside: Beyond the spectral envelope as the fundamental representation for speech recognition,” *IEEE Signal Processing Magazine*, 22(5):81-88, 2005.
- X. Lei, M.-Y. Hwang and M. Ostendorf, “Incorporating tone-related MLP posteriors in the feature representation for Mandarin ASR,” *Proc. Interspeech Conference*, pp. 2981-2984, 2005.
- T. Shinozaki, M. Ostendorf and L. Atlas, “Data sampling for improved speech recognizer training,” *Proc. Interspeech Conference*, pp. 1693-1696, 2005.
- A. Mandal, M. Ostendorf, and A. Stolcke, “Leveraging speaker-dependent variation of adaptation,” *Proc. Interspeech Conference*, pp. 1793-1796, 2005.
- O. Çetin and M. Ostendorf, “Multi-rate and variable-rate modeling of speech at phone and syllable time scales,” *Proc. ICASSP*, Vol. I, pp. 665-668, 2005.
- X. Lei, G. Ji, M. Ostendorf and J. Bilmes, “DBN-Based Multi-stream Models for Mandarin Toneme Recognition,” *Proc. ICASSP*, Vol. I, pp. 349-353, 2005.
- B. Chen, Ö. Çetin, G. Doddington, N. Morgan, M. Ostendorf, T. Shinozaki, and Q. Zhu, “A CTS Task for Meaningful Fast-Turnaround Experiments,” *Proc. Rich Transcription Workshop*, November 2004.
- * I. Shafran and M. Ostendorf, “Acoustic Model Clustering Based on Syllable Structure,” *Computer Speech and Language*, vol. 17, no. 4, pp. 311-328, 2003.

- O. Çetin and M. Ostendorf, “Cross-stream Observation Dependencies for Multi-stream Speech Recognition,” *Proc. Eurospeech*, pp. 2517-2520, September 2003.
- * H. Nock and M. Ostendorf, “Parameter reduction schemes for loosely coupled HMMs,” *Computer Speech and Language*, vol. 17, no. 2-3, pp. 233-262, 2003.
- * C. Boulis, M. Ostendorf, E. Riskin, and S. Otterson “Graceful Degradation of Speech Recognition Performance over Packet-Erasure Networks,” *IEEE Transactions on Speech and Audio Processing*, vol. 10, no. 8, pp. 580-590, 2002.
- R. Bates and M. Ostendorf, “Modeling Pronunciation Variation in Conversational Speech Using Prosody,” *Proc. ISCA Tutorial and Research Workshop on Pronunciation Modeling and Lexicon Adaptation for Spoken Language*, Sept. 2002.
- I. Shafran, M. Ostendorf, and R. Wright, “Prosody and phonetic variability: lessons learned from acoustic model clustering,” *Proc. of the ISCA Workshop on Prosody in Speech Recognition and Understanding*, pp. 127-131, October 2001.
- R. Bates and M. Ostendorf, “Reducing the Effects of Pronunciation Variability on Spontaneous Speech Recognition using Prosody and Discourse,” *Proc. of the ISCA Workshop on Prosody in Speech Recognition and Understanding*, pp. 17-22, October 2001.
- D. Palmer and M. Ostendorf, “Improved Word Confidence Estimation using Long Range Features,” *Proc. of Eurospeech*, pp. 2117-2120, September 2001.
- E. Riskin, C. Boulis, S. Otterson and M. Ostendorf, “Graceful Degradation of Speech Recognition Performance Over Lossy Packet Networks,” *Proc. of Eurospeech*, pp. 2715-2718, September 2001.
- *+ M. Ostendorf, “Incorporating linguistic theories of phonological variation into speech recognition models,” *Phil. Trans. Royal Society*, vol. 358, no. 1769, pp. 1325-1338, 2000.
- *+ M. Bacchiani and M. Ostendorf, “Joint Lexicon, Acoustic Unit Inventory and Model Design,” *Speech Communication*, vol. 29, 2-4, pp. 99-114, 1999.
- I. Shafran and M. Ostendorf, “Use of higher level linguistic structure in acoustic modeling for speech recognition,” *Proc. of the International Conference on Acoustics, Speech and Signal Processing*, vol. III, pp. 1643-1646, 2000.
- + M. Ostendorf, “Moving beyond the ‘beads-on-a-string’ model of speech,” *Proc. IEEE ASRU Workshop*, 1999.
- * R. Bates and M. Ostendorf, “Reducing the Effects of Linear Channel Distortion on Continuous Speech Recognition,” *IEEE Transactions on Speech and Audio Processing*, vol. 7, no. 5, pp. 594-597, 1999.
- M. Bacchiani and M. Ostendorf, “Using Automatically-Derived Acoustic Subword Units in Large Vocabulary Speech Recognition,” *Proc. of the International Conference on Spoken Language Processing*, 1998, vol. 5, pp. 1843-1846.
- + M. Ostendorf, A. Kannan, and O. Ronen, “Tree-based Dependence Models for Speech Recognition,” in *Computational Models of Speech Pattern Processing*, K. Ponting (Ed.), Springer-Verlag, pp. 40-53, 1998.
- + M. Ostendorf, “Segmental Acoustic Models,” in *Computational Models of Speech Pattern Processing*, K. Ponting (Ed.), Springer-Verlag, pp. 157-172, 1998.
- M. Bacchiani and M. Ostendorf, “Joint Acoustic Unit Design and Lexicon Generation,” *Proc. of the ESCA Workshop on Modeling Pronunciation Variation for Automatic Speech Recognition*, 1998, pp. 7-12.
- * A. Kannan and M. Ostendorf, “A comparison of constrained trajectory models for large vocabulary speech recognition,” *IEEE Transactions on Speech and Audio Processing*, vol. 6, no. 3, pp. 303-306, May 1998.
- A. Kannan and M. Ostendorf, “Modeling Dependency in Adaptation of Acoustic Models using Multiscale Tree Processes,” *Proc. Eurospeech*, vol. 4, pp. 1863-1866, 1997.

- A. Kannan and M. Ostendorf, "Adaptation of Polynomial Trajectory Segment Models for Large Vocabulary Speech Recognition," *Proc. of the International Conference on Acoustics, Speech and Signal Processing*, Vol. II, pp. 1411-1414, 1997.
- * M. Ostendorf and H. Singer, "HMM Topology Design using Maximum Likelihood Successive State Splitting," *Computer Speech and Language*, 11, No. 1, pp. 17-42, 1997. (ATR Interpreting Telecommunications Laboratories paper award.)
- M. Ostendorf, B. Byrne, M. Bacchiani, M. Finke, A. Gunawardana, K. Ross, S. Roweis, E. Shriberg, D. Talkin, A. Waibel, B. Wheatley and T. Zeppenfeld, "Modeling Systematic Variations in Pronunciation in a Language-Dependent Hidden Speaking Mode," *Proc. of the International Conference on Spoken Language Processing*, 1996, supplementary paper.
- * M. Ostendorf, V. Digalakis and O. Kimball, "From HMMs to Segment Models: A Unified View of Stochastic Modeling for Speech Recognition," *IEEE Transactions on Speech and Audio Processing*, vol. 4, no. 5, September 1996, pp. 360-378. (Received 1999 IEEE Signal Processing Society Paper Award.)
- + M. Ostendorf, "From HMMs to Segment Models: Stochastic Modeling for CSR," in *Automatic Speech and Speaker Recognition - Advanced Topics*, C. H. Lee, F. K. Soong and K. K. Paliwal (Eds.), pp. 185-210, Kluwer Academic Publishers, 1996.
- M. Bacchiani, M. Ostendorf, Y. Sagisaka and K. Paliwal, "Design of a Speech Recognition System based on Acoustically Derived Segmental Units," *Proc. of the International Conference on Acoustics, Speech and Signal Processing*, Vol. I, pp. 443-446, 1996.
- O. Ronen and M. Ostendorf, "A Dependence Tree Model of Phone Correlation," *Proc. of the International Conference on Acoustics, Speech and Signal Processing*, Vol. II, pp. 873-876, 1996.
- H. Singer and M. Ostendorf, "Maximum Likelihood Successive State Splitting," *Proc. of the International Conference on Acoustics, Speech and Signal Processing*, Vol. II, pp. 601-604, 1996.
- F. Richardson, M. Ostendorf and J. R. Rohlicek, "Lattice-based Search Strategies for Large Vocabulary Speech Recognition," *Proc. of the International Conference on Acoustics, Speech and Signal Processing*, Vol. 1, pp. 576-579, 1995.
- * A. Kannan, M. Ostendorf and J. R. Rohlicek, "Maximum Likelihood Clustering of Gaussians for Speech Recognition," *IEEE Trans. Speech and Audio Processing*, Vol. 2, No. 3, July 1994, pp. 453-455.
- * V. Digalakis, J. R. Rohlicek, and M. Ostendorf, "ML Estimation of a Stochastic Linear System with the EM Algorithm and its Application to Speech Recognition," *IEEE Transactions on Speech and Audio Processing*, vol. 1, no. 4, October 1993, pp. 431-442.
- A. Kannan and M. Ostendorf, "A Comparison of Trajectory and Mixture Modeling in Segment-based Word Recognition," *Proc. of the International Conference on Acoustics, Speech and Signal Processing*, Vol. II, April 1993, pp. 327-330.
- O. Kimball and M. Ostendorf, "On the Use of Tied-Mixture Distributions," *Proc. of the DARPA Workshop on Human Language Technology*, March 1993, pp. 102-107.
- * V. Digalakis, M. Ostendorf and J. R. Rohlicek, "Fast Algorithms for Phone Classification and Recognition Using Segment-Based Models," *IEEE Transactions on Signal Processing*, vol. 40, no. 12, December 1992, pp. 2885-2896.
- * O. Kimball, M. Ostendorf, and I. Bechwati, "Context Modeling with the Stochastic Segment Model," *IEEE Transactions on Signal Processing*, vol. 40, no. 6, June 1992, pp. 1584-1587.
- M. Ostendorf, I. Bechwati and O. Kimball, "Context Modeling with the Stochastic Segment Model," the *Proc. of the International Conference on Acoustics, Speech and Signal Processing*, March 1992, Vol. I, pp. 389-392.

- B. Necioglu, M. Ostendorf and J. R. Rohlicek, “A Bayesian Approach to Speaker Adaptation of the Stochastic Segment Model,” the *Proc. of the International Conference on Acoustics, Speech and Signal Processing*, March 1992, Vol. I, pp. 437-440.
- O. Kimball, M. Ostendorf and J. R. Rohlicek, “Recognition Using Classification and Segmentation Scoring,” *Proc. of the DARPA Workshop on Speech and Natural Language*, pp. 197-201, February 1992.
- A. Kannan, M. Ostendorf and J. R. Rohlicek, “Weight Estimation for N-Best Rescoring,” *Proc. of the DARPA Workshop on Speech and Natural Language*, pp. 455-456, February 1992.
- + M. Ostendorf and V. Digalakis, “The Stochastic Segment Model for Continuous Speech Recognition,” *Proc. of the 25th Asilomar Conference on Signals, Systems and Computers*, pp. 964-968, November 1991.
- V. Digalakis, J. R. Rohlicek, M. Ostendorf, “A Dynamical System Approach to Continuous Speech Recognition,” *Proc. of the International Conference on Acoustics, Speech and Signal Processing*, May 1991, pp. 289-292.
- M. Ostendorf, A. Kannan, S. Austin, O. Kimball, R. Schwartz, J. R. Rohlicek, “Integration of Diverse Recognition Methodologies Through Reevaluation of N-Best Sentence Hypotheses,” *Proc. of the DARPA Workshop on Speech and Natural Language*, February 1991, pp. 83-87.
- V. Digalakis, M. Ostendorf, J. R. Rohlicek, “Fast Search Algorithms for Connected Phone Recognition Using the Stochastic Segment Model,” *Proc. of the DARPA Speech and Natural Language Workshop*, June 1990, pp. 173-178.
- M. Ostendorf and J. R. Rohlicek, “Joint Quantizer Design and Parameter Estimation for Discrete Hidden Markov Models,” *Proc. of the International Conference on Acoustics, Speech and Signal Processing*, April 1990, pp. 705-708.
- * M. Ostendorf and S. Roukos, “A Stochastic Segment Model for Phoneme-Based Continuous Speech Recognition,” *IEEE Transactions on Acoustics, Speech and Signal Processing*, Vol. 37, No. 12, December 1989, pp. 1857-1869.
- V. Digalakis, M. Ostendorf and J. R. Rohlicek, “Improvements in the Stochastic Segment Model for Phoneme Recognition,” *Proc. of the 2nd DARPA Speech and Natural Language Workshop*, October 1989, pp. 332-338.
- S. Roukos, M. Ostendorf, H. Gish, A. Derr, “Stochastic Segment Modelling Using the Estimate-Maximize Algorithm,” *Proc. of the International Conference on Acoustics, Speech and Signal Processing*, New York, NY, April 1988, pp. 127-130.
- S. Roukos and M. Ostendorf Dunham, “A Stochastic Segment Model for Phoneme-Based Continuous Speech Recognition,” *Proc. of the International Conference on Acoustics, Speech and Signal Processing*, Dallas, Texas, April 1987, pp. 73-76. (A reprint appears in *Readings in Speech Recognition*, ed. A. Waibel and K.-F. Lee, Morgan Kaufmann Publishers Inc., 1990.)
- with Y. Chow *et al.*, “The Role of Word-Dependent Coarticulatory Effects in a Phoneme-Based Speech Recognition System,” *Proc. of the International Conference on Acoustics, Speech and Signal Processing*, Tokyo, Japan, April 1986.

Language Models and Processing

- * J. G. Kahn and M. Ostendorf, “Joint Reranking of Parsing and Word Recognition with Automatic Segmentation,” *Computer, Speech and Language*, Vol. 26, No. 1, pp. 1-19, 2012.
- * B. Hutchinson, M. Ostendorf and M. Fazel, “Low Rank Language Models for Small Training Sets,” *Signal Processing Letters*, Vol. 8, No. 9, pp. 489-492, 2011.
- J. Medero and M. Ostendorf, “Identifying Targets for Syntactic Simplification,” *Proc. SLaTE Workshop*, to appear, 2011.

- A. Marin, B. Zhang and M. Ostendorf, “Detecting Forum Authority Claims in Online Discussions,” *Proc. Workshop on Language in Social Media*, pp. 39-47, 2011.
- with E. Bender et al., “Annotating Social Acts: Authority Claims and Alignment Moves in Wikipedia Talk Pages,” *Proc. Workshop on Language in Social Media*, pp. 48-57, 2011.
- A. Marin, M. Ostendorf, B. Zhang, J. Morgan, M. Oxley, M. Zachry and E. Bender, “Detecting authority bids in online discussions,” *Proc. IEEE Workshop on Spoken Language Technology*, pp. 49-54, 2010.
- A. Margolis, K. Livescu and M. Ostendorf, “Domain adaptation with unlabeled data for dialog act tagging,” *Proc. ACL Workshop on Domain Adaptation for Natural Language Processing*, pp. 45-52, 2010.
- W. Wu, B. Zhang and M. Ostendorf, “Automatic generation of personalized annotation tags for Twitter users,” *Proc. NAACL HLT*, pp. 689-692, 2010.
- B. Zhang, B. Hutchinson, W. Wu, and M. Ostendorf “Extracting phrase patterns with minimum redundancy for unsupervised speaker role classification,” *Proc. NAACL HLT*, pp. 717-720, 2010.
- B. Hutchinson, B. Zhang, and M. Ostendorf, “Unsupervised broadcast conversation speaker role labeling,” *Proc. ICASSP*, pp. 5322-5325, 2010.
- B. Zhang, W. Wu, J. G. Kahn and M. Ostendorf, “Improving the recognition of names by document-level clustering,” *Proc. Interspeech*, pp. 1035-1038, 2009.
- S. Feldman, M. Marin, J. Medero, and M. Ostendorf, “Classifying factored genres with part-of-speech histograms,” *Proc. NAACL HLT*, pp. 173-176, 2009.
- S. Feldman, M. Marin, M. Ostendorf and M. Gupta, “Part-of-Speech Histogram Features for Genre Classification of Text,” *Proc. ICASSP*, pp. 4781-4784, 2009.
- + M. Marin, S. Feldman, M. Ostendorf, and M. Gupta, “Filtering web text to match target genres,” *Proc. ICASSP*, pp. 3705-3708, 2009.
- * S. Petersen and M. Ostendorf, “A machine learning approach to reading level assessment,” *Computer, Speech and Language*, vol. 23, no. 1, pp. 89-106, 2009.
- S. Hahn and M. Ostendorf, “A Comparison of Discriminative EM-Based Semi-supervised Learning Algorithms on Agreement/Disagreement Classification,” *Proc. NIPS Workshop on Speech and Language: Learning-based Methods and Systems*, 2008.
- K. Laskowski, M. Ostendorf and T. Schultz, “Modeling vocal interaction for text-independent participant characterization in multi-party conversation,” *Proc. SIGDial Workshop on Discourse and Dialogue*, June 2008.
- * I. Bulyko, M. Ostendorf, M. Siu, T. Ng, A. Stolcke and Ö. Cetin, “Web resources for language modeling in conversational speech recognition,” *ACM Trans. on Speech and Language Processing*, vol. 5, no. 1, December 2007.
- S. Petersen and M. Ostendorf, “Text simplification for language learners: A corpus analysis,” *Proc. SLaTE Workshop*, pp. 69-72, October 2007.
- K. Laskowski, M. Ostendorf, and T. Schultz, “Modeling vocal interaction for text-independent classification of conversation type,” *Proc. SIGDial Workshop on Discourse and Dialogue*, September 2007, pp. 194-201.
- P. Giesemann and M. Ostendorf, “Problem-sensitive response generation in human-robot dialogs,” *Proc. SIGDial Workshop on Discourse and Dialogue*, September 2007.
- S. Petersen and M. Ostendorf, “Assessing the reading level of web pages,” *Proc. Interspeech*, September 2006, pp. 833-836.

- S. Hahn, R. Ladner and M. Ostendorf, “Agreement/disagreement classification: exploiting unlabeled data using contrast classifiers,” *Proc. HLT-NAACL*, Comp. Vol., pp. 53-56, 2006.
- C. Boulis and M. Ostendorf, “Text classification by augmenting the bag-of-words representation with redundancy-compensated bigrams,” *Proc. International Workshop on Feature Selection in Data Mining*, in conjunction with SIAM SDM-05, 2005, pp. 9-16, 2005.
- C. Boulis and M. Ostendorf, “A quantitative analysis of lexical differences between genders in telephone conversations,” *Proc. of the Annual Meeting of the Association for Computational Linguistics*, June 2005.
- S. Schwarm and M. Ostendorf, “Reading Level Assessment Using Support Vector Machines and Statistical Language Models,” *Proc. of the Annual Meeting of the Association for Computational Linguistics*, June 2005.
- T. Ng, M. Ostendorf, M.-Y. Hwang, M. Siu, I. Bulyko and X. Lei, “Web-data augmented language models for Mandarin conversational speech recognition,” *Proc. ICASSP*, Vol. I, pp. 589-593, 2005.
- * D. Palmer and M. Ostendorf, “Improving Out-of-Vocabulary Name Resolution,” *Computer Speech and Language*, vol. 19, no. 1, pp. 107-128, 2005.
- C. Boulis and M. Ostendorf, “Combining multiple clustering systems,” *Proc. European Conference on Principles of Knowledge Discovery in Databases*, pp. 63-74, 2004.
- * S. Schwarm, I. Bulyko and M. Ostendorf, “Adaptive language modeling with varied sources to cover new vocabulary items,” *IEEE Trans. Speech and Audio Processing*, vol. 12, no. 3, pp. 334-342, 2004.
- I. Bulyko, M. Ostendorf and A. Stolcke, “Getting more mileage from web text sources for conversational speech language modeling using class-dependent mixtures,” *Proc. HLT-NAACL*, Comp. Vol., pp. 7-9, May 2003.
- S. Schwarm and M. Ostendorf, “Text normalization with varied data sources for conversational speech language modeling,” *Proc. of the International Conference on Acoustics, Speech and Signal Processing*, vol. I, pp. 789-792, May 2002.
- * R. Sproat, A. Black, S. Chen, S. Kumar, M. Ostendorf and C. Richards, “Normalization of Non-Standard Words,” *Computer Speech and Language*, vol. 15, no. 3, pp. 287-333, 2001.
- D. Palmer and M. Ostendorf, “Improving Information Extraction by Modeling Errors in ASR Output,” *Proc. of the Human Language Technology Workshop*, pp. 156-160, March 2001.
- * D. Palmer and M. Ostendorf, “Robust Information Extraction from Automatically Generated Speech Transcriptions,” *Speech Communication*, vol. 32, pp. 95-109, 2000.
- M. Siu and M. Ostendorf, “Integrating a Context-Dependent Phrase Grammar in the variable n-gram framework,” *Proc. of the International Conference on Acoustics, Speech and Signal Processing*, vol. II, pp. 1021-1024, 2000.
- * M. H. Siu and M. Ostendorf, “Variable N-grams and Extensions for Conversational Speech Language Modeling,” *IEEE Transactions on Speech and Audio Processing*, vol. 8, no. 1, pp. 63-75, 2000.
- D. Palmer, M. Ostendorf and J. Burger, “Robust information extraction from spoken language data,” *Proc. Eurospeech*, 1999, pp. 1035-1038.
- * R. Iyer and M. Ostendorf, “Relevance Weighting for Combining Multi-Domain Data for N-Gram Language Modeling,” *Computer Speech and Language*, vol. 13, no. 3, pp. 267-282, 1999.
- D. Palmer, J. Burger, and M. Ostendorf, “Information Extraction from Broadcast News Speech Data,” *Proc. of the DARPA Broadcast News and Understanding Workshop*, 1999, pp. 41-46.
- * R. Iyer and M. Ostendorf, “Modeling Long Distance Dependence in Language: Topic Mixtures vs. Dynamic Cache Models,” *IEEE Transactions on Speech and Audio Processing*, vol. 7, no. 1, pp. 30-39, January 1999.

- R. Iyer, M. Ostendorf, and M. Meteer, “Analyzing and Predicting Language Model Improvements,” *IEEE Workshop on Speech Recognition and Understanding Proc.*, (S. Furui, B.-H. Juang, & W. Chou, eds.) pp. 254-261, 1997.
- R. Iyer and M. Ostendorf, “Transforming Out-of-Domain Estimates to Improve In-Domain Language Models,” *Proc. Eurospeech*, vol. 4, pp. 1975-1978, 1997.
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Surveys and Columns

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Mentoring for Academic Careers in Engineering: Proceedings of the PAESMEM/Stanford School of Engineering Workshop, ed. E. Riskin, M. Ostendorf, P. Cosman, M. Effros, J. Li, S. Hemami, R. M. Gray, Grayphics Publishing, 2005.

SELECTED INVITED TALKS:

“Translatable Language Technology – Beyond HMMs and N-grams,” *International Symposium on Chinese Spoken Language Processing*, plenary, December 2010.

“Representations of prosody in computational models for language processing,” *Speech Prosody Conference*, plenary, May 2010.

“Transcribing speech for spoken language processing,” *Interspeech Conference*, plenary, September 2009.

“On the role of local learning for language modeling,” *NIPS Workshop on Speech and Language: Learning-based Methods and Systems*, December 2008.

“Managing spoken documents,” *International Workshop on Multimedia Signal Processing*, plenary, October 2006.

“Understanding prosody for understanding speech,” *Complexity Conference of the Northwestern Institute on Complex Systems*, April 2006.

“Spontaneous speech: challenges and opportunities for parsing,” *International Workshop on Parsing Technologies*, plenary, October 2005.

“Modeling Spoken Language,” USC EE Department Distinguished Lecture Series, September 2004.

“An overview of speech recognition,” *American Association for the Advancement of Science*, February 2004.

“Prosody models for conversational speech recognition,” *2nd Plenary Meeting and Symposium on Prosody and Speech Processing*, University of Tokyo, February 2003.

“The impact of speech recognition on speech synthesis,” *IEEE 2002 Workshop on Speech Synthesis*, September 2002.

“Integrating speech synthesis with language generation,” *International Natural Language Generation Conference*, July 2002.

“Humanizing the voice of the machine,” M. Ostendorf and Jim Fruchterman, *American Association for the Advancement of Science*, February 2000.

“Moving beyond the ‘beads-on-a-string’ model of speech,” *IEEE ASRU Workshop*, December 1999.

“Incorporating linguistic theories of phonological variation into speech recognition models,” *Royal Society/British Academy joint discussion meeting*, London, UK, September 1999.

“A Dynamical System Model for Recognition of Intonation Labels,” *ATR International Workshop on Computational Modeling of Prosody for Spontaneous Speech Processing*, Kyoto, Japan, April 1995.

“Lectures on segment modeling and hierarchical acoustic modeling,” *NATO ASI Workshop on Computational Models of Speech Pattern Processing*, Jersey, UK, July 1997.

“Prosody and Speech Recognition – the ASR View,” *Workshop on Methods and Models of Spoken Word Recognition, at the Max Planck Institute for Psycholinguistics*, Nijmegen, Netherlands, January 1995.

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“Prosody, Generation and Spoken Language Systems,” *International Workshop on Text Generation*, Kennebunkport, Maine, June 1994.

“Computational Models of Prosody for Spoken Language Processing,” Case Western Reserve University, NSF-sponsored Invited Speaker Series, April 1992.

“The Stochastic Segment Model for Continuous Speech Recognition,” *25th Asilomar Conference on Signals, Systems and Computers*, November 1991.

“Research in speech understanding”, NSF CISE Directorate review, September 1989.

Invited lectures in academic and industrial research labs: MIT-LCS (1989, 1991, 1997), BBN (1989), Xerox PARC (1990, 1992), AT&T (1991), SRI (1991, 1995, 1996), IBM (1991), Brown University (1991), NTT Tokyo (1993), ATR (1993, 1995, 1997), Cambridge University (1994), Johns Hopkins University (1994, 1996, 1997), ICSI (1994), Dragon Systems (1994), DRA (1994), Microsoft (1996), MIT-RLE (1998), Ohio State University (1998), University of Edinburgh (1999), Oregon Graduate Institute (2001), ISI/USC (2001), UCLA (2001), Tokyo Institute of Technology (2003), UW/Microsoft Linguistics Symposium (2004), Cambridge University (2005), University of Karlsruhe (2006), IDIAP (2006), Technical University of Munich (2006), Northwestern University (2006), University of Erlangen (2006), Saarland University and DFKI (2006), Bosch (2007), JHU CLSP (2007), Microsoft (2008), UCLA (2008), National University of Singapore (2011)

RESEARCH AWARDS:

(\$16.5M total, \$12.7M excluding subcontracts; as PI except where noted)

- “Prosody Analysis/Synthesis Using Probabilistic Models and Linguistic Theory,” NSF, 12/88-12/91 (with MIT and SRI).
- “Evaluating the Use of Prosodic Information in Speech Recognition and Understanding,” NSF-DARPA, 8/89-8/92; NSF creativity award follow-on “Use of Prosody in Speech Understanding,” 7/92-7/96 (with MIT and SRI).
- “Segment-based Acoustic Models with Multi-Level Search Algorithms for Continuous Speech Recognition,” NSF-DARPA, 8/89-8/92 (with BBN).
- “Segment-Based Acoustic Models for Continuous Speech Recognition,” DARPA-ONR, 6/92-5/95 (with BBN).
- “Duration Prediction for Text-to-Speech Synthesis,” Apple Computer, Inc., 6/92-8/92.
- “Annotating a Radio News Corpus,” Linguistics Data Consortium, 5/93-4/94.
- “Computational Modeling of Intonation,” NYNEX, 6/93 - 3/95.
- “High-order Modeling Techniques for Continuous Speech Recognition,” ONR, 1/95 – 3/97.
- “Structural Assumptions and Training Techniques for Improving the Portability of Statistical Language Models,” subcontract to BBN Inc., 9/95 – 9/98.
- “Development of Automatic Training Algorithms for Speaker-Specific F0 Generation,” subcontract to Entropic Research Lab, 1/96 – 12/96.
- “Speech Generation for Human-Computer Interaction,” NSF, 5/96 – 4/99.
- “Acoustic Modeling for Spontaneous Speech Recognition,” ATR Interpreting Telecommunications Research Laboratories, 8/96 – 7/98.

- “Speech Generation for Human-Computer Language Interfaces,” ARPA-ONR, 9/96 – 8/97.
- “Modeling Structure in Speech above the Segment for Spontaneous Speech Recognition,” NSF 3/97 – 2/00.
- “Center for Auditory and Acoustics Research,” (co-PI with L. Atlas), ONR subcontract via the University of Maryland, total grant is 1997 - 2002.
- “Workshop for Discussing Research Priorities and Evaluation Strategies in Speech Synthesis,” NSF, 7/98 – 6/99.
- “Acquisition of Computer Facilities to Support and Interdisciplinary Multidata Signal and Image Processing Laboratory,” Co-PI with H. Nawab, W. C. Karl, and D. Castañon, NSF, 9/98 – 8/01.
- “Robust recognition and dialog tracking for interactive information access,” DARPA, 1/00 – 12/03 (with ICSI).
- “Feature-Based Automatic Language Identification,” Department of Defense, 7/00 – 9/02.
- “Adaptive language modeling for automatic speech recognition of meetings,” IBM, 6/00 – 6/02.
- “Information Access to Spoken Documents,” NSF (subcontract via Mississippi State), 9/00 – 12/04.
- “Mapping Meetings: Language Technology to Make Sense of Human Interaction,” NSF (subcontract via ICSI), 9/01 – 9/05.
- “Correlation of Prosodic Structure and Phonetic Prototypes: Implications for Human and Automatic Speech Recognition,” UW Center for Mind, Brain and Learning, 7/01 – 3/02.
- “Effective Affordable Reusable Speech-to-Text,” DARPA (subcontract via SRI), 5/02 – 12/04.
- “EARS Novel Approaches: Rethinking Acoustic Processing,” DARPA (subcontract via ICSI), 6/02 – 12/04.
- “Effective Affordable Reusable Speech-to-Text: Semantic Annotation for Rich Transcription of Speech,” DARPA (subcontract via BBN), 6/02 – 12/04.
- “ITR: Translation Technology for Language Modeling,” NSF, (includes subcontract to ISI), 9/03 – 8/08, with supplement to support a summer workshop on semi-supervised learning.
- “A Collaborative Program for EE Systems Education,” NSF, 9/05 – 2/08.
- “GALE: Rich Transcription for Machine Translation,” DARPA (subcontract to SRI), 9/05 – 6/09.
- “Linguistic Cues to Social Goals in Spoken and Virtual, Private and Broadcast Interactions,” IARPA, 8/2009 – 10/2011.
- “Simplifying Text for Individualized Reading Needs,” NSF, 9/2009 – 8/2012.
- “Northwest Alliance for Access to Science, Technology, Engineering and Mathematics (AccessStemII),” Co-PI with Sheryl Burgstahler, NSF, 11/09 – 10/13.
- Industrial gifts for collaborative research from Microsoft, Bosch, and AT&T, and from Intel for educational activities.

RESEARCH AND PROJECT SUPERVISION:

- Post-doctoral researcher supervision:
 - Harriet Nock (2001-2002)
 - Ivan Bulyko (2002-2004)
 - Takahiro Shinozaki (2004-2006)

- Gang Peng (2006-2007)
- Ph.D. Thesis supervision: (23 graduated, 8 in progress)
 - Colin Wightman, EE Ph.D. 1991, Boston University
Automatic detection of prosodic constituents for parsing
(Formerly co-founder of Linguistech, Professor and Chair at Minnesota State University, Professor at Acadia University; currently at Walden University.)
 - Vassilios Digalakis, SE Ph.D. 1992, Boston University
Segment-based stochastic models of spectral dynamics for continuous speech recognition
(Formerly at SRI International, now a Professor of EE at the Technical Institute of Crete in Greece.)
 - Nanette Veilleux, SE Ph.D. 1994, Boston University
Computational models of the prosody/syntax mapping for spoken language systems
(Now an Assoc. Professor of Computer Science, Simmons College.)
 - Owen Kimball, EE Ph.D. 1994, Boston University
Segment modeling alternatives for continuous speech recognition
(Now in the Speech Signal Processing Group, Raytheon BBN Technologies.)
 - Ken Ross, EE Ph.D. 1995, Boston University
Modeling of intonation for speech synthesis
(Formerly at BBN, Alphatech, Whitehead Institute; current affiliation unknown.)
 - Orith Ronen, BME Ph.D. 1996, Boston University
Dependence tree models of intra-utterance phone dependence
(Formerly at SRI International; now at Nuance.)
 - Ashvin Kannan, EE Ph.D. 1997, Boston University
Adaptation of spectral trajectory models for large vocabulary continuous speech recognition
(Formerly at Nuance Communications, now at Yahoo.)
 - Man-Hung Siu, EE Ph.D. 1998, Boston University
Learning local lexical structure in spontaneous speech language modeling
(Now in the Speech Signal Processing Group, Raytheon BBN Technologies.)
 - Rukmini Iyer, EE Ph.D. 1998, Boston University
Improving and predicting performance of statistical language models in sparse domains
(Formerly at BBN, Nuance and Yahoo; now at Microsoft.)
 - Michiel Bacchiani, EE Ph.D. 1999, Boston University
Speech recognition system design based on automatically derived units
(Formerly at AT&T Research, IBM Research; now at Google.)
 - David Palmer, EE Ph.D. 2001, University of Washington
Modeling Uncertainty for Information Extraction from Speech Data
(Formerly at MITRE; now at Virage.)
 - Izhak Shafran, EE Ph.D. 2001, University of Washington
Clustering wide-contexts and HMM topologies for spontaneous speech recognition
(Now an Asst. Professor at Oregon Health Sciences Institute/OGI.)
 - Randall Fish, EE Ph.D. 2001, University of Washington
Dynamic models of machining vibrations, designed for classification of tool wear
(Formerly a Professor at Eastern Nazarene College; now a Professor at Messiah College.)
 - Ivan Bulyko, EE Ph.D. 2002, University of Washington
Joint prosody prediction and unit selection for speech synthesis
(Now in the Speech Signal Processing Group, Raytheon BBN Technologies.)
 - Rebecca Bates, EE Ph.D. 2004, University of Washington
Dynamic pronunciation modeling in spontaneous speech recognition
(Now an Assoc. Professor at Minnesota State University, Mankato, MN.)

- Ozgur Cetin, EE Ph.D. 2004, University of Washington
Multi-rate modeling, model inference and estimation for statistical classifiers
(Formerly at ICSI and Yahoo; now at Morgan Stanley.)
- Constantinos Boulis, EE Ph.D. 2005, University of Washington
Topic Learning in Text and Conversational Speech
(Formerly a Research Associate at Stanford University; now at Medio Systems, Inc.)
- Xin Lei, EE Ph.D. 2006, University of Washington
Modeling lexical tones for Mandarin large vocabulary continuous speech recognition
(Formerly at Microsoft, then SRI International; now at Google.)
- Arindam Mandal, EE Ph.D. 2007, University of Washington
Transformation Sharing Strategies for MLLR Speaker Adaptation
(Now at SRI International.)
- Sarah Petersen, CSE Ph.D. 2007, University of Washington
Natural Language Processing Tools for Reading Level Assessment and Text Simplification for Bilingual Education
(Now at MITACS, Inc.)
- Dustin Hillard, EE Ph.D. 2008, University of Washington
Automatic Sentence Structure Annotation for Spoken Language Processing
(Formerly at Yahoo; now at Microsoft.)
- Scott Otterson, EE Ph.D. 2008, University of Washington
Use of Speaker Location Features in Meeting Diarization
(Formerly at 3Tier group; now at the Technical University of Denmark.)
- Jeremy Kahn, Linguistics Ph.D. 2010, University of Washington
Parse decoration of the word sequence in the speech-to-text machine-translation pipeline
(Formerly at Wordnik; now job hunting in Seattle)
- Sangyun Hahn, CSE Ph.D. candidate, University of Washington (w/ R. Ladner)
Semi-supervised learning techniques for annotating activities in meetings
(ABD, now at Google)
- Alex Marin, EE Ph.D. candidate, University of Washington (w/ M. Gupta)
Leveraging text from multiple genres in language processing
- Anna Margolis, EE Ph.D. candidate, University of Washington
Domain adaptation for annotation of structure in spoken language
- Brian Hutchinson, EE Ph.D. candidate, University of Washington
Low rank models for speech and language processing tasks
- Bin Zhang, EE Ph.D. candidate, University of Washington
Learning linguistic features for text classification
- Wei Wu, EE Ph.D. candidate, University of Washington
Combining active and semisupervised learning in language processing
- Julie Medero, EE Ph.D. candidate, University of Washington
Text simplification for multiple domains
- Nicole Nichols, EE Ph.D. candidate, University of Washington
Automatic identification of individual marine mammals
- M.S. Thesis Supervision: (15 graduated)
 - John Butzberger, Jr., M.S. EE 1989, Boston University
Statistical methods for intonation pattern recognition
 - Ibrahim Bechwati, M.S. EE 1990, Boston University
Structural alternatives in stochastic segment modeling for speech recognition

- Burhan Necioglu, M.S. EE 1992, Boston University
Bayesian adaptation of the stochastic segment model for speech recognition
- Ashvin Kannan, M.S. EE 1992, Boston University
Robust estimation of stochastic segment models for word recognition
- Cynthia Fong, M.S. EE 1993, Boston University
Statistical models of duration for synthesis and recognition
- Rukmini Iyer, M.S. EE 1994, Boston University
Language modeling with sentence-level mixtures
- Fred Richardson, M.S. EE 1995, Boston University
Search algorithms for speech recognition
- Rebecca Bates, M.S. EE 1996, Boston University
Linear channel estimation and compensation for recognition of telephone speech
- Cameron Fordyce, M.S. EE 1998, Boston University
Control of prosodic patterns for speech generation in human-computer dialogs
- Yuliya Lobacheva, M.S. EE 2000, Boston University
Discourse mixture language models
- Hariharan Shivakumar, M.S. 2000, Boston University (w/ D. Castañón)
Estimating confidence of milling tool wear classification
- Jay Joungbum Kim, M.S. 2004, University of Washington
Automatic detection of disfluencies in speech
- Jeremy Kahn, Linguistics M.A. 2005, University of Washington
Moving beyond the lexical layer in parsing conversational speech
- William McNeill, Linguistics M.A. 2006, University of Washington
Segmentation and Feature Selection for Conversational Speech Syntactic Language Models
- Amy Dashiell, M.S. EE 2009, University of Washington
Automatic detection of frustration in spoken dialog systems using non-segmental features and context

UNIVERSITY SERVICE: (at the University of Washington)

- EE Department
 - Promotion and Tenure Committee (2011)
 - Undergraduate admissions (2009)
 - Executive Committee (2007-2008)
 - Awards Committee (2007-2008)
 - HallowEEen Design Challenge Committee (2007, 2008)
 - Faculty Search Committee (2000, 2007)
 - Merit Review Committee (2007, 2008)
 - Development Committee (2004-2005)
 - EE Chair Search Committee (2003-2004)
 - Associate Chair for Research (2001-2003)
 - Faculty Advisory Board (2001-2003)
 - Research Committee (2000-2004)
 - Signal processing curriculum group chair (2000-2001, 2003-2004)
 - Curriculum Committee (2000-2001, 2003-3004)

- Core Curriculum Revision Committee (2000)
- Strategic Planning Committee (1999-2000)
- Ad hoc Committee on Research Computer Support Restructuring (2001)
- College of Engineering
 - Boeing-Egtvedt Chair Review Committee (2010)
 - Advisor to the student chapter of the Society of Women Engineers (2006-2009)
 - Aeronautics and Astronautics Department Faculty Search (2008)
 - Mechanical Engineering Department 10-year Review Committee (2007)
 - Chemical Engineering Chair Review Committee (2005)
 - CSE Chair Search Committee (2001)
 - College of Engineering Associate Dean Search Committee (2000)
- University
 - APL Director Review Committee, Chair (2011)
 - Activity-based Budgeting ICR subteam (2010)
 - Industrial Relations Task Force (2009-2011)
 - Committee on Risk Assessment of Faculty Recruiting and Retention (2009)
 - Task Force on Graduate Student Support (2009)
 - Research Advisory Board (2009-2011)
 - Academic Advisory Group (2009-2011)