Michael I Mandel

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Current position

Associate Professor, Computer & Information Science, Brooklyn College (CUNY). Faculty in the Computer Science and Linguistics PhD Programs at the CUNY Graduate Center.

Research interests

Deep learning for speech, audio, and music
Noise robust automatic speech recognition and speech enhancement
Very high quality speech enhancement via speech synthesis
Psychoacoustics of speech perception in noise

Education

2010 Feb — PhD with distinction in Electrical Engineering, Columbia University
- Dissertation: "Binaural Model-Based Source Separation and Localization"
- Committee: Daniel Ellis (advisor), Barbara Shinn-Cunningham, Shih-Fu Chang, Richard Stern, Xiaodong Wang

2008 May — MPhil in Electrical Engineering, Columbia University

2006 Feb — MS in Electrical Engineering, Columbia University, GPA: 4.1/4.0

2004 Jun — BS in Computer Science and Engineering, MIT, GPA: 4.9/5.0

Academic positions

2018 – present — **Brooklyn College, CUNY**, Computer & Info. Science, Associate Professor

2015 – 2018 — **Brooklyn College, CUNY**, Computer & Info. Science, Assistant Professor

2016 – present — **Graduate Center, CUNY**, Linguistics PhD Program, Assistant Professor

2015 – present — **Graduate Center, CUNY**, Computer Science PhD Program, Assistant Professor

2015 Jul–Aug — **Jelinek Speech and Language Technologies Workshop**, Far-field Speech team, Senior member

2012 – 2015 — **The Ohio State University**, Computer Science & Eng., Research Scientist

2014 May–Jun — **Télécom ParisTech**, Signal & Image Processing, Visiting professor, AAO Group

2009 – 2010 — **Université de Montréal**, Département d'informatique et de recherche opérationnelle, Postdoctoral researcher, LISA Lab

2004 – 2009 — **Columbia University**, Electrical Engineering, Research Assistant, LabROSA

2008 May–Jun — **Boston University**, Cog. & Neur. Sys., Visiting scholar, Shinn-Cunningham Lab

2003 – 2004 — **MIT**, CS/AI Lab, Undergraduate RA for Prof Bill Freeman

2002 – 2004 — **MIT**, MediaLab, Undergraduate RA for Prof Barry Vercoe

Work experience

2018 Jun–Aug	**CTRL-Labs**, New York, NY, Visiting Scientist
2017 Jun–Aug	**HearUNow, Inc**, Woodside, CA, Consultant
2010 – 2012	**Audience, Inc**, Mountain View, CA, Algorithm developer
2009 – 2010	**Musically Intelligent Machines LLC**, New York, NY, Founder, CEO
2007 Jun–Aug	**Google, Inc.**, New York, NY, Software Engineering Intern, Google News
2006 Mar–Sep	**Owl Multimedia**, New York, NY, Co-founder, Dir. Technology
2004 Jun–Aug	**Bose Corporation**, Framingham, MA, Research intern, uMusic™ project

Funding

National Science Foundation Award OPP-1839185, September 2018 – August 2023. " Collaborative Research: Navigating the New Arctic (NNA): Soundscape ecology to assess environmental and anthropogenic controls on wildlife behavior." PI: Michael Mandel. $535,581.

National Science Foundation Award IIS-1750383, June 2018 – May 2023. "CAREER: Integrating perceptual models of auditory importance into deep learning-based noise-robust speech recognition." PI: Michael Mandel. $497,162.

National Science Foundation REU Supplement to Award IIS-1618061. July 2017 – December 2017. $8,000.

Alfred P Sloan Foundation CUNY Junior Faculty Research Award for Science and Engineering (JFRASE). April 2017 – March 2018. $50,000.

National Science Foundation Award IIS-1618061, June 2016 – May 2019. "RI: Small: Concatenative Resynthesis for Very High Quality Speech Enhancement." PI: Michael Mandel. $449,958.

PSC-CUNY Research Award, Trad-B Project #69638-00 47, July 2016, "A game for identifying important speech cues." PI: Michael Mandel. $5,931.

Google Research Award, February 2016, "Incorporating a speech model into multichannel spatial clustering." PI: Michael Mandel. $50,430.

National Endowment for the Humanities Award HD-228966-15, May 2015 – October 2016. "Automatic Music Performance Analysis and Comparison Toolkit (AMPACT): An empirical exploration of expressive musical performance." PI: Johanna Devaney. Co-PI: Michael Mandel. $59,843

National Science Foundation Award IIS-1409431, June 2014 – May 2017. "RI: Medium: Deep Neural Networks for Robust Speech Recognition through Integrated Acoustic Modeling and Separation." PI: Eric Fosler-Lussier, Co-PIs: Michael Mandel and DeLiang Wang. $798,082.

Telecom ParisTech, February 2014, "Learning to recognize sounds for the separation of musical mixtures." PI: Michael Mandel. $5,641.

Google Research Award, August 2013, "Learning to recognize sounds for separation." PI: Michael Mandel. $49,308.

Awards

Top 10% of reviewers NIPS 2018, awarded free registration

Third prize for project "Auditory Bubbles Game", New York City Media Lab Summit, Demo Expo, 2017, $500

Outstanding undergraduate research mentor, Ohio State University, 2013

Postdoctoral research fellowship, Le Fonds québécois de la recherche sur la nature et les technologies, Merit Scholarship Program for Foreign Students 2009–2010, $35,000

Dissertation with distinction, top 10% of Columbia dissertations

Presidential Fellowship, Columbia University School of Engineering and Applied Sciences, 2004–2009, $116,700 plus tuition:

- Sep 2004 – Aug 2005: $30,000 + 2 semesters' tuition
- Sep 2005 – May 2006: $22,500 + 2 semesters' tuition
- Jan 2007 – May 2007: $14,600 + 1 semester's tuition
- Sep 2007 – Aug 2008: $35,000 + 2 semesters' tuition
- Jan 2009 – May 2009: $14,600 + 1 semester's tuition

Second place, Columbia Venture Competition 2009, Columbia University School of Enchineering and Applied Sciences, $7,000

First place, Music Information Retrieval Evaluation eXchange 2008 Audio Artist and Classical Composer Identification task. Tied for first place in Audio Tag Classification task.

First place, Music Information Retrieval Evaluation eXchange 2005 Audio Artist Identification.

Honorable mention, NSF Graduate Research Fellowship Program, 2004.

Top 5% of 180 students in 6.003: Signals and Systems, May 2002.

Emerson Music Scholarship to study saxophone with Jeff Harrington at the Berklee School of Music, 2001–2002 and 2002–2003, $1,200 total.

Publications

Books, Chapters, Theses

M. I. Mandel, S. Araki, and T. Nakatani, "Multichannel clustering and classification approaches," in *Audio Source Separation and Speech Enhancement* (E. Vincent, T. Virtanen, and S. Gannot, eds.), ch. 12, Wiley, 2018. To appear.

M. I. Mandel and J. P. Barker, "Multichannel spatial clustering using model-based source separation," in *New Era for Robust Speech Recognition: Exploiting, Deep Learning* (S. Watanabe, M. Delcroix, F. Metze, and J. R. Hershey, eds.), ch. 3, Springer, 2017.

X. Xiao, S. Watanabe, H. Erdogan, M. Mandel, L. Lu, J. R. Hershey, M. L. Seltzer, G. Chen, Y. Zhang, and D. Yu, "Discriminative beamforming with phase-aware neural networks for speech enhancement and recognition," in *New Era for Robust Speech Recognition: Exploiting, Deep Learning* (S. Watanabe, M. Delcroix, F. Metze, and J. R. Hershey, eds.), ch. 4, Springer, 2017.

J. Devaney, M. I. Mandel, D. Turnbull, and G. Tzanetakis, eds., *Proceedings of the 17th International Society for Music Information Retrieval Conference (ISMIR)*. 2016.

M. I. Mandel, *Binaural Model-Based Source Separation and Localization*. PhD thesis, Columbia University, Feb. 2010.

T. Bertin-Mahieux, D. Eck, and M. I. Mandel, "Automatic tagging of audio: The state-of-the-art," in *Machine Audition: Principles, Algorithms and Systems* (W. Wang, ed.), ch. 14, pp. 334–352, IGI Publishing, 2010.

Journal

M. I. Mandel, S. E. Yoho, and E. W. Healy, "Measuring time-frequency importance functions of speech with bubble noise," *Journal of the Acoustical Society of America*, vol. 140, pp. 2542–2553, 2016.

H. Larochelle, M. I. Mandel, R. Pascanu, and Y. Bengio, "Learning algorithms for the classification restricted boltzmann machine," *Journal of Machine Learning Research*, vol. 13, pp. 643–669, Mar. 2012.

J. Devaney, M. I. Mandel, D. P. W. Ellis, and I. Fujinaga, "Automatically extracting performance data from recordings of trained singers," *Psychomusicology: Music, Mind & Brain*, vol. 21, no. 1-2, pp. 108–136, 2012.

M. I. Mandel, R. Pascanu, D. Eck, Y. Bengio, L. M. Aiello, R. Schifanella, and F. Menczer, "Contextual tag inference," *ACM Transactions on Multimedia Computing, Communications and Applications*, vol. 7S, pp. 32:1–32:18, Oct. 2011.

R. Weiss, M. I. Mandel, and D. P. W. Ellis, "Combining localization cues and source model constraints for binaural source separation," *Speech Communication*, vol. 53, pp. 606–621, May 2011.

M. I. Mandel, S. Bressler, B. Shinn-Cunningham, and D. P. W. Ellis, "Evaluating source separation algorithms with reverberant speech," *IEEE Transactions on Audio, Speech, and Language Processing*, vol. 18, no. 7, pp. 1872–1883, 2010.

M. I. Mandel, R. J. Weiss, and D. P. W. Ellis, "Model-based expectation maximization source separation and localization," *IEEE Transactions on Audio, Speech, and Language Processing*, vol. 18, pp. 382–394, Feb. 2010.

M. I. Mandel and D. P. W. Ellis, "A web-based game for collecting music metadata," *Journal of New Music Research*, vol. 37, no. 2, pp. 151–165, 2008.

T. S. Huang, C. K. Dagli, S. Rajaram, E. Y. Chang, M. I. Mandel, G. E. Poliner, and D. P. W. Ellis, "Active learning for interactive multimedia retrieval," *Proceedings of the IEEE*, vol. 96, no. 4, pp. 648–667, 2008.

M. I. Mandel, G. E. Poliner, and D. P. W. Ellis, "Support vector machine active learning for music retrieval," *Multimedia systems*, vol. 12, pp. 1–11, Aug. 2006.

Conference

S. Maiti and M. I. Mandel, "Speech denoising by parametric resynthesis," in *Proceedings of the IEEE International Conference on Acoustics, Speech, and Signal Processing*, 2019. To appear.

S. Maiti, J. Ching, and M. I. Mandel, "Large vocabulary concatenative resynthesis," in *Proceedings of Interspeech*, pp. 1190–1194, 2018.

V. A. Trinh, B. McFee, and M. I. Mandel, "Bubble cooperative networks for identifying important speech cues," in *Proceedings of Interspeech*, pp. 1616–1620, 2018.

A. R. Syed, V. A. Trinh, and M. I. Mandel, "Concatenative resynthesis with improved training signals for speech enhancement," in *Proceedings of Interspeech*, pp. 1195–1199, 2018.

S. Maiti and M. I. Mandel, "Concatenative resynthesis using twin networks," in *Proceedings of Interspeech*, pp. 3647–3651, 2017.

A. Syed, A. Rosenberg, and M. I. Mandel, "Active learning for low-resource speech recognition: Impact of selection size and language modeling data," in *Proceedings of the IEEE International Conference on Acoustics, Speech, and Signal Processing*, 2017.

J. Devaney and M. I. Mandel, "An evaluation of score-informed methods for estimating fundamental frequency and power from polyphonic audio," in *Proceedings of the IEEE International Conference on Acoustics, Speech, and Signal Processing*, 2017.

M. I. Mandel and J. P. Barker, "Multichannel spatial clustering for robust far-field automatic speech recognition in mismatched conditions," in *Proceedings of Interspeech*, pp. 1991–1995, 2016.

M. I. Mandel, "Directly comparing the listening strategies of humans and machines," in *Proceedings of Interspeech*, pp. 660–664, 2016.

H. Erdogan, J. Hershey, S. Watanabe, M. I. Mandel, and J. L. Roux, "Improved MVDR beamforming using single-channel mask prediction networks," in *Proceedings of Interspeech*, pp. 1981–1985, 2016.

X. Xiao, S. Watanabe, H. Erdogan, L. Lu, J. Hershey, M. L. Seltzer, G. Chen, Y. Zhang, M. Mandel, and D. Yu, "Deep beamforming networks for multi-channel speech recognition," in *Proceedings of the IEEE International Conference on Acoustics, Speech, and Signal Processing*, pp. 5745–5749, IEEE, mar 2016.

D. Bagchi, M. I. Mandel, Z. Wang, Y. He, A. Plummer, and E. Fosler-Lussier, "Combining spectral feature mapping and multi-channel model-based source separation for noise-robust automatic speech recognition," in *Proceedings of the IEEE Workshop on Automatic Speech Recognition and Understanding*, pp. 496–503, 2015.

M. I. Mandel and Y. S. Cho, "Audio super-resolution using concatenative resynthesis," in *IEEE Workshop on Applications of Signal Processing to Audio and Acoustics*, 2015.

S. S. Tirumala and M. I. Mandel, "Exciting estimated clean spectra for speech resynthesis," in *IEEE Workshop on Applications of Signal Processing to Audio and Acoustics*, 2015.

M. I. Mandel and N. Roman, "Enforcing consistency in spectral masks using markov random fields," in *Proceedings of EUSIPCO*, pp. 2028–2032, 2015.

M. I. Mandel, Y.-S. Cho, and Y. Wang, "Learning a concatenative resynthesis system for noise suppression," in *Proceedings of the IEEE GlobalSIP conference*, 2014.

M. I. Mandel, S. E. Yoho, and E. W. Healy, "Generalizing time-frequency importance functions across noises, talkers, and phonemes," in *Proceedings of Interspeech*, 2014.

M. I. Mandel and A. Narayanan, "Analysis-by-synthesis feature estimation for robust automatic speech recognition using spectral masks," in *Proceedings of the IEEE International Conference on Acoustics, Speech, and Signal Processing*, 2014.

A. Nandi, L. Jiang, and M. I. Mandel, "Gestural query specification," in *Proceedings of the International Conference on Very Large Data Bases*, vol. 7, 2014.

M. I. Mandel, "Learning an intelligibility map of individual utterances," in *IEEE Workshop on Applications of Signal Processing to Audio and Acoustics*, 2013.

N. Roman and M. Mandel, "Classification based binaural dereverberation," in *Proceedings of Interspeech*, 2013.

J. Devaney, M. I. Mandel, and I. Fujinaga, "A study of intonation in three-part singing using the automatic music performance analysis and comparison toolkit (AMPACT)," in *Proceedings of the International Society for Music Information Retrieval conference*, 2012.

J. Devaney, M. I. Mandel, and I. Fujinaga, "Characterizing singing voice fundamental frequency trajectories," in *IEEE Workshop on Applications of Signal Processing to Audio and Acoustics*, pp. 73–76, Oct. 2011.

M. I. Mandel, D. Eck, and Y. Bengio, "Learning tags that vary within a song," in *Proceedings of the International Society for Music Information Retrieval conference*, pp. 399–404, Aug. 2010.

J. Bergstra, M. I. Mandel, and D. Eck, "Scalable genre and tag prediction with spectral covariance," in *Proceedings of the International Society for Music Information Retrieval conference*, pp. 507–512, Aug. 2010.

E. Law, K. West, M. I. Mandel, M. Bay, and J. S. Downie, "Evaluation of algorithms using games: the case of music annotation," in *Proceedings of the International Society for Music Information Retrieval conference*, pp. 387–392, Oct. 2009.

M. I. Mandel and D. P. W. Ellis, "The ideal interaural parameter mask: a bound on binaural separation systems," in *IEEE Workshop on Applications of Signal Processing to Audio and Acoustics*, pp. 85–88, Oct. 2009.

J. Devaney, M. I. Mandel, and D. P. W. Ellis, "Improving MIDI-audio alignment with acoustic features," in *IEEE Workshop on Applications of Signal Processing to Audio and Acoustics*, pp. 45–48, Oct. 2009.

R. J. Weiss, M. I. Mandel, and D. P. W. Ellis, "Source separation based on binaural cues and source model constraints," in *Proceedings of Interspeech*, pp. 419–422, Sept. 2008.

M. I. Mandel and D. P. W. Ellis, "Multiple-instance learning for music information retrieval," in *Proceedings of the International Society for Music Information Retrieval conference*, pp. 577–582, Sept. 2008.

D. P. W. Ellis, C. V. Cotton, and M. I. Mandel, "Cross-correlation of beat-synchronous representations for music similarity," in *Proceedings of the IEEE International Conference on Acoustics, Speech, and Signal Processing*, pp. 57–60, Apr. 2008.

M. I. Mandel and D. P. W. Ellis, "EM localization and separation using interaural level and phase cues," in *IEEE Workshop on Applications of Signal Processing to Audio and Acoustics*, pp. 275–278, Oct. 2007.

M. I. Mandel and D. P. W. Ellis, "A web-based game for collecting music metadata," in *Proceedings of the International Society for Music Information Retrieval conference* (S. Dixon, D. Bainbridge, and R. Typke, eds.), pp. 365–366, Sept. 2007.

M. I. Mandel, D. P. W. Ellis, and T. Jebara, "An EM algorithm for localizing multiple sound sources in reverberant environments," in *Advances in Neural*

Information Processing Systems (B. Schölkopf, J. Platt, and T. Hoffman, eds.), pp. 953–960, Cambridge, MA: MIT Press, 2007.

M. I. Mandel and D. P. W. Ellis, "Song-level features and support vector machines for music classification," in *Proceedings of the International Society for Music Information Retrieval conference* (J. D. Reiss and G. A. Wiggins, eds.), pp. 594–599, Sept. 2005.

E. B. Sudderth, M. I. Mandel, W. T. Freeman, and A. S. Willsky, "Distributed occlusion reasoning for tracking with nonparametric belief propagation," in *Advances in Neural Information Processing Systems* (L. K. Saul, Y. Weiss, and L. Bottou, eds.), pp. 1369–1376, Cambridge, MA: MIT Press, 2005.

Other

H. Ghaly and M. I. Mandel, "Analyzing human and machine performance in resolving ambiguous spoken sentences," in *1st Workshop on Speech-Centric Natural Language Processing (SCNLP)*, pp. 18–26, 2017.

J. Choi and M. I. Mandel, "Perception of korean fricatives and affricates in 'bubble' noise by native and nonnative speakers," in *International Circle of Korean Linguistics*, 2017.

M. I. Mandel and N. Roman, "Integrating markov random fields and model-based expectation maximization source separation and localization," in *Acoustical Society of America Spring Meeting*, 2015.

M. I. Mandel, S. E. Yoho, and E. W. Healy, "Listener consistency in identifying speech mixed with particular bubble noise instances," in *Acoustical Society of America Spring Meeting*, 2015.

M. I. Mandel and S. H. Chon, "Using auditory bubbles to determine spectro-temporal cues of timbre," in *Cognitively Based Music Informatics Research (CogMIR)*, 2014.

A. Nandi and M. I. Mandel, "The interactive join: Recognizing gestures for database queries," in *CHI Works-In-Progress*, 2013.

M. Mandel, R. Pascanu, H. Larochelle, and Y. Bengio, "Autotagging music with conditional restricted boltzmann machines," Mar. 2011. Online: http://arxiv.org/abs/1103.2832.

M. I. Mandel and D. P. W. Ellis, "A probability model for interaural phase difference," in *ISCA Workshop on Statistical and Perceptual Audio Processing SAPA*, pp. 1–6, 2006.

E. B. Sudderth, M. I. Mandel, W. T. Freeman, and A. S. Willsky, "Visual hand tracking using nonparametric belief propagation," in *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition Workshops*, pp. 189–197, 2004.

Teaching

CUNY Graduate Center, Linguistics Program

2017 Fall 78100: Methods in Computational Linguistics I, Instructor, 12 masters students

CUNY Graduate Center, Computer Science Program

2016 Fall 83060: Speech and Audio Understanding, Instructor, 9 PhD students

Brooklyn College, Department of Computer and Information Science

2018 Fall 7610X: Multimedia databases, Instructor, 13 masters students

2018 Spring 1600: Intro. to Multimedia Computing, Instructor, 40 undergraduate students

2017 Fall 7610X: Multimedia databases, Instructor, 20 masters students

2017 Spring 1600: Intro. to Multimedia Computing, Instructor, 35 undergraduate students

2016 Spring 7610X: Multimedia databases, Instructor, 12 masters students

2016 Spring 1600: Intro. to Multimedia Computing, Instructor, 35 undergraduate students

2015 Fall 1600: Intro. to Multimedia Computing, Instructor, 32 undergraduate students

The Ohio State University, Department of Computer Science and Engineering

2014 Fall 5226: Neural networks, Instructor, 25 masters students

6539: Speech & language reading group, Co-instructor, 16 students

2014 Spring 6539: Speech & language reading group, Co-instructor, 10 students

2013 Fall 6539: Speech & language reading group, Co-instructor, 11 students

2013 July Machine learning, Sennheiser Technology & Innovation Center, Instructor

- 5-day course for 8 Sennheiser employees
- Designed course, created materials, presented lectures and labs

Columbia University, Department of Electrical Engineering

2009 Spring 6820: Speech & audio processing & recognition, Co-lecturer, 7 students

2008 Fall 4810: Digital Signal Processing, Teaching Assistant, 60 masters students

2008 Summer 6820: Speech & audio processing & recognition, Manager, 5 PhD students

2008 Spring 6820: Speech & audio processing & recognition, Co-lecturer, 9 PhD students

Theses supervised

PhD	2018 Feb	Min Ma, "Adaptation and augmentation: Towards better rescoring strategies for automatic speech recognition and spoken term detection." CUNY Graduate Center, Computer Science
Masters	2018 Jun	Daniel Chait, "Extract and synthesize: Percussive instruments." Brooklyn College, MA in Computer Science
	2018 Apr	Jiyoung Choi, "Speech perception in 'bubble' noise: Korean fricatives and affricates by native and non-native Korean listeners." CUNY Graduate Center, MA in Computational Linguistics
Bachelors	2018 May	Oleksandr Loyko, "deep beamforming network for multi-channel speech recognition." Brooklyn College, Computer and Information Science Honors Thesis
	2013 May	Jordan Hawkins, "Automating Music Production with Music Information Retrieval." Ohio State University, Electrical and Computer Engineering, Honors Research Thesis

Students supervised

PhD	2018–2019	Hussein Ghaly, Felix Grezes, Zhaoheng Ni, Soumi Maiti, Hassan Salami, Ali Raza Syed, Trinh Viet Anh
	2017–2018	Hussein Ghaly, Felix Grezes, Min Ma, Zhaoheng Ni, Soumi Maiti, Ali Raza Syed, Trinh Viet Anh

	2016–2017	Felix Grezes, Min Ma, Zhaoheng Ni, Soumi Maiti, Ali Raza Syed, Trinh Viet Anh
	2014–2015	Young Suk Cho
	2013–2014	Young Suk Cho
MA	2018–2019	Mengxuan Zhao
	2017–2018	Daniel Chait, Jiyoung Choi, Mengxuan Zhao
	2016–2017	Daniel Chait, Jiyoung Choi
	2015–2016	Sreyas Srimath Tirumala
BS	2018–2019	Shelby Ahmed, Joey Ching, Christian Sarcona
	2017–2018	Shelby Ahmed, Eugene Chen, Joey Ching, Xiaowen Huang, Dzmitry Kasinets, Oleksandr Loyko, Max Ohsawa, Christian Sarcona Max Shteyman, Muhammad Tahir Vali
	2016–2017	Alex Aquino, Eugene Chen, Heriberto Cortes, Renee Esses, Klanti Islam
	2014–2015	Thomas Lyons Benjamin Oberhaus Rachel Nelson
	2013–2014	Santosh Kantharaj, Kyle MacNicholas, Austin Mackey, Erik Ringman
	2012–2013	Jordan Hawkins

Invited talks

2017 Sep 7	JP Morgan Chase, "Noise robust speech processing using strong and weak models"
2016 Dec 16	Spotify, "Auditory bubbles: Estimating time frequency importance functions of speech and music"
2016 Nov 11	New York University, "Auditory bubbles: Estimating time frequency importance functions of speech and music"
2015 Oct 22	Speech and Audio in the Northeast (SANE) Workshop, "Multichannel spatial clustering at the 2015 Jelinek Workshop on Speech and Language Technologies"
2015 Sep 9	Columbia University, "Analysis-by-synthesis for source separation and speech recognition"
2015 Jun 29	Jelinek Speech and Language Technologies Summer School, "Noise robustness in Automatic Speech Recognition"
2015 Apr 1	Telecom ParisTech, "Machine learning and optimization in speech analysis-by-synthesis systems"
2015 Mar 20	CCRMA Hearing Seminar, "Auditory bubbles: Estimating time frequency importance functions"
2015 Mar 18	Google, "Analysis-by-synthesis for speech recognition and source separation"
2015 Mar 16	York University, "Rich models of digital media: Driving analysis from human perception"
2015 Jan 28	University of Illinois, Urbana-Champaign, "Detailed models for understanding speech in noise"
2014 Jul 11	McMaster University, "Auditory bubbles: Estimating time frequency importance functions"
2014 Jun 25	École Normal Supérieure, "Auditory bubbles: Estimating time frequency importance functions"
2014 Jun 13	Sheffield University, "Detailed models for understanding speech in noise"

2014 May 2	Queen Mary University London, “Strong models for understanding sounds in mixtures”
2014 Feb 12	Toyota Technological Institute, Chicago, “Detailed models for understanding speech in noise”
2014 Feb 7	Mitsubishi Electric Research Labs, “Detailed models for understanding speech in noise”
2014 Jan 15	Dartmouth Computer Science Colloquium, “Context-dependent models for understanding speech in noise”
2013 Nov 15	CIRMMT Workshop on symbolic music processing, semantic audio, and music information retrieval, “Extracting descriptive tags from audio using restricted Boltzmann machines”
2013 Apr 30	Telecom ParisTech, “Model-based source separation in reverberant mixtures”
2012 Oct 6	First Samsung Intenational Symposium on Hearing Aids, “Model based source separation”
2012 June 29	CCRMA Music Information Retrieval Workshop 2012, “Training automatic music taggers”
2012 May 11	CCRMA Hearing Seminar, “Evaluating reverberant source separation”
2010 Apr 19	Google, “Training automatic music taggers”
2009 Nov 25	New York University, “Automatically describing music”
2009 Oct 16	Drexel University, “Binaural Model-based Source Separation and Localization”
2008 Dec 15	Last.fm, “MajorMiner: Automatically describing music”
2008 Dec 15	Cambridge University, “Model-based EM source separation and localization in reverberant mixtures.”
2008 Dec 10	Sheffield University, “Model-based EM source separation and localization in reverberant mixtures.”
2008 Nov 5	Dorkbot NYC, “MajorMiner: Automatically describing music”
2008 Nov 4	McGill University, Music Technology Student Colloquium, “MajorMiner: Automatically describing music”
2008 Jun 13	Boston University Hearing Research Seminar, “Model-based EM source separation and localization in reverberant mixtures.”
2008 Feb 18	Université de Montréal, “Model-based EM source separation and localization.”
2007 Nov 16	New York University, “EM localization and separation using interaural level and phase cues.”
2007 Oct 9	Université de Montréal, “EM localization and separation using interaural level and phase cues.”

Service

Dept.	2018–2021	BC CIS Appointments Committee
	2017–Pres.	BC CIS Undergraduate Outcomes Assessment Committee (Chair)
	2012–2015	Organizer for the OSU CSE AI Seminar
	2008	Co-founder of the Columbia Electrical Engineering Signal and Information Processing Seminar Series (EESIP SS), 2008 organizer

College	2018–2021	Faculty Council representative, School of Natural & Behavioral Sciences
	2017–Pres.	Undergraduate Admissions Committee
Univ.	2016–Pres.	CUNY Interdisciplinary Research Grant review committee
Field	2017–2020	Associate Editor, Journal of the Acoustical Society of America, Speech Communication area
	2017	Co-organizer, Speech and Audio in the NorthEast (SANE) Workshop
	2017	Invited participant, IRCAM Workshop on reverse correlation for high-level audio cognition, Paris
	2016–2019	Member, IEEE Technical Committee on Audio and Acoustic Signal Processing
	2016	Publications chair, International Society of Music Information Retrieval Conference
	2014	Lead Organizer and moderator for the panel "The Future of Audio Multimedia" with Gerald Friedland at ACM Multimedia, panelists Dan Ellis, Gerald Friedland, Youngmoo Kim, Josh McDermott, and Paris Smaragdis.
	2011	Publicity chair for the IEEE Workshop on Applications of Signal Processing to Audio and Acoustics
	2008	Co-organizer of the Montreal Music and Machine Learning workshop at the Université de Montréal
	2008	Tutorial and panel chair, ISMIR
	2008	Co-organizer of the Audio Tag Classification task, Music Information Retrieval Evaluation eXchange (MIREX)
	2007	Co-founder of the North Eastern Music Information Special Interest Group (NEMISIG), 2007 co-organizer

Other contributions

Program Committees	2018	Machine Learning in Speech and Language Processing Workshop (MLSLP)
	2018	International Conference on Machine Learning (ICML)
	2018	Association for the Advancement of Artificial Intelligence (AAAI)
	2017	International Society for Music Information Retrieval Conference (ISMIR)
	2017	International Conference on Machine Learning (ICML)
	2016	Annual Conference of the International Speech Communication Association (Interspeech)
	2016	Speech Processing in Everyday Environments Workshop at Interspeech
	2016	International Society for Music Information Retrieval Conference (ISMIR)
	2016	International Conference on Machine Learning (ICML)
	2015	IEEE Workshop on Applications of Signal Processing to Audio & Acoustics (WASPAA)

Journal Reviews

- IEEE Transactions in Audio Speech and Language Processing, 2007–18
- IEEE Transactions on Multimedia, 2010–18
- IEEE Transactions on Signal Processing, 2013–18
- ACM Transactions on Knowledge and Data Engineering, 2013
- Computer Speech & Language, 2016–18
- Journal of the Acoustical Society of America Express Letters, 2013–2016
- Journal of the Acoustical Society of America, 2012–13
- Speech Communication, 2012–15
- EURASIP Journal on Audio, Speech, and Music Processing, 2012–13, 2017
- IEEE Signal Processing Letters, 2010–15

Conference Reviews

- Intl. Conference on Learning Representations (ICLR), 2013–18

- IEEE Intl. Conference on Audio Speech and Signal Processing (ICASSP), 2006–18
- Joint Workshop on Hands-free Speech Communication and Microphone Arrays (HSCMA), 2017
- International Conference on Artificial Intelligence and Statistics (AISTATS), 2017–18
- Neural Information Processing Systems (NIPS), 2017–18
- Intl. Society of Music Information Retrieval Conference, 2006–15
- Annual Conference of the Intl. Speech Communication Association (INTERSPEECH), 2014–2015
- Intl. Conference on Machine Learning (ICML), 2013–14
- Intl. Conference on Very Large Data Bases (VLDB) 2013
- IEEE Intl. Conference on Emerging Signal Processing Applications, 2011

Associations

- IEEE Student member 2007–2009, Member 2010–present
- ACM Member 2013–present
- Acoustical Society of America, associate member 2015–present
- Society for Music Theory, joint member, 2015–present

Brooklyn, February 3, 2019