# Bryan A. Pardo

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## EDUCATION

| | |
|---|---|
| 4/05 | Ph.D., Computer Science and Engineering<br>The University of Michigan, Ann Arbor, MI, USA |
| 12/01 | M. Mus., Jazz and Improvisation<br>The University of Michigan, Ann Arbor, MI, USA |
| 12/93 | M.S., Computer Science<br>The Ohio State University, Columbus, OH, USA |
| 6/90 | B.Mus., Jazz Composition<br>The Ohio State University, Columbus, OH, USA |

## PROFESSIONAL EMPLOYMENT

| | |
|---|---|
| 9/19 – now | Professor<br>Department of Computer Science<br>Center for Human-Computer Interaction + Design (Co-director)<br>Master's program in Sound Arts and Industries<br>Northwestern University, Evanston, IL |
| 9/10 – 8/19 | Associate Professor<br>Department of Electrical Engineering and Computer Science<br>Department of Music Theory and Cognition<br>Master's program in Sound Arts and Industries<br>Segal Design Institute<br>Northwestern University, Evanston, IL |
| 9/04 – 8/10 | Assistant Professor<br>Department of Electrical Engineering and Computer Science<br>Department of Music Theory and Cognition<br>Northwestern University, Evanston, IL |
| 1/03 – 5/04 | Adjunct Professor<br>Department of Music<br>Madonna University, Livonia, MI |
| 5/96 – 8/98 | Systems Developer<br>Department of Speech and Hearing Science<br>Ohio State University, Columbus, OH |
| 1/94 – 4/96 | Software Engineer<br>SPSS Inc., Chicago, IL |

# RESEARCH FUNDING

| Title | Funding Source | Amount | Dates | Role |
|---|---|---|---|---|
| TOTAL FUNDING | | $4,316,774 | | |
| Research Gift | **Adobe** | $18,000 | 6/25 | PI |
| Aural Enhancement Via Natural Language Control | **Toyota** | $213,722 | 6/25-5/26 | PI |
| Research Gift | **Adobe** | $57,000 | 2/24 | PI |
| Research Gift | **Dolby** | $30,000 | 8/23 | PI |
| Collaborative Research: Engaging Blind and Visually Impaired Youth in Computer Science through Music Programming | **NSF** | $440,206 | 6/23-5/26 | PI |
| Collaborative Research: FW-HTF-R: Toward an Ecosystem of Artificial-intelligence-powered Music Production (TEAMuP) | **NSF** | $542,139 | 9/22-9/26 | PI |
| Expressive and Controllable Voice Synthesis and Conversion | **Sony** | $100,000 | 9/22-1/24 | PI |
| Research Gift | **Shure** | $10,000 | 10/21 | PI |
| CHS: Medium: Next Generation Content Production Tools for People with Vision Impairments | **NSF** | $440,206 | 10/19-9/24 | Co-PI |
| III: Small: Collaborative Research: Algorithms for Query by Example of Audio Databases | **NSF** | $212,596 | 9/16-8/20 | PI |
| Research Gift | **Adobe** | $90,000 | 6/15-12/22 | PI |
| CHS: Small: Robust Interactive Audio Source Separation | **NSF** | $514,261 | 10/14-9/18 | PI |
| HCC: Small: Building Audio Interfaces with Crowdsourced Concept Maps and Active Transfer Learning | **NSF** | $499,804 | 9/11 – 8/16 | PI |
| Making Music Documents Accessible in Musical Terms | **NSF CAREER** | $506,669 | 1/07 - 12/12 | PI |
| Personalized Tools to Enhance Musical Creativity | **NSF** | $166,000 | 6/08 – 5/12 | PI |
| Bootstrapping Adaptive Personalized Music Search with Game-based Collaborative Tagging | **NSF** | $476,171 | 9/08 – 8/12 | PI |

# PUBLICATIONS (total citations 6543, h-index 41, i-10 index 122)

### CONFERENCES AND WORKSHOPS REVIEWED ON FULL PAPER SUBMISSIONS

1. Orr Paradise, Pranav Muralikrishnan, Circle Chen, Hugo Flores Garcia, Bryan Pardo, David F. Gruber, Shane Gero, Shafi Goldwasser, "Towards A Translative Model of Sperm Whale Vocalization," The Thirty-Ninth Annual Conference on Neural Information Processing Systems (NeurIPS 2025), December 2-7, 2025, San Diego, California, USA
2. Jason Brent Smith, Annie Chu, Noel Alben, Shi Ding, Kevin Gautier, Stephen Garrett, Brian Magerko, Jason Freeman, Bryan Pardo, Stephanie Ludi, Taneisha Lee, Tom McKlin, "Using Co-Design to Investigate Affordances of an Expressive CS Learning Environment for Students who are BVI," The 27th International ACM SIGACCESS Conference on Computers and Accessibility, October 26-29, 2025, Denver, Colorado, USA
3. Patrick O'Reilly, Julia Barnett, Hugo Flores Garcia, Annie Chu, Nathan Bruyne, Prem Seetharaman, Bryan Pardo, "The Rhythm in Anything: Audio-prompted Drums Generation with Masked Language Modeling," International Society of Music Information Retrieval Conference (ISMIR 2025), September 21-25, 2025, Daejeon, Korea
4. Patrick O'Reilly, Zeyu Jin, Jiaqi Su, Bryan Pardo, "Deep Audio Watermarks are Shallow: Limitations of Post-Hoc Watermark Techniques for Speech," ICLR Workshop on GenAI Watermarking, Singapore, April 26, 2025
5. Annie Chu, Patrick O'Reilly, Julia Barnett, Bryan Pardo, "Text2FX: Harnessing CLAP Embeddings for Text-Guided Audio Effects," IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Hyderabad, India, April 6-11, 2025
6. Hugo Flores García, Oriol Nieto, Justin Salamon, Bryan Pardo, Prem Seetharaman, "Sketch2Sound: Controllable Audio Generation via Time-Varying Signals and Sonic Imitations," IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Hyderabad, India, April 6-11, 2025
7. Patrick O'Reilly, Prem Seetharaman, Jiaqu Su, Zebu Jin, Bryan Pardo, "Code Drift: Towards Idempotent Neural Audio Codecs," IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Hyderabad, India, April 6-11, 2025
8. Julia Barnett, Bryan Pardo, "Exploring Musical Roots: Applying Audio Embeddings to Empower Influence Attribution for a Generative Music Model," International Society of Music Information Retrieval Conference (ISMIR 2024), November 10–14, 2024, San Francisco, CA, USA
9. Max Morrison, Cameron Churchwell, Nathan Pruyne, Bryan Pardo, "Fine-Grained and Interpretable Neural Speech Editing," Interspeech 2024, Kos Island, Greece, September 1-5, 2024
10. Erika Rumbold, George Tzanetakis, Bryan Pardo, "Correlations Between Objective and Subjective Evaluations of Music Source Separation," Sound and Music Computing, Porto, Portugal, July 4-6, 2024
11. Cameron Churchwell, Max Morrison, Bryan Pardo, " High Fidelity Neural Phonetic Posteriorgrams," ICASSP 2024 Workshop on Explainable AI for Speech and Audio, Seoul, April 14-19, 2024
12. Patrick O'Reilly, Zeyu Jin, Jiaqi Su, and Bryan Pardo, "MaskMark: Robust Neural Watermarking for Real and Synthetic Speech," IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Seoul, April 14-19, 2024
13. Max Morrison, Pranav Pawar, Nathan Pruyne, Jennifer Cole, and Bryan Pardo, "Crowdsourced and Automatic Speech Prominence Estimation," IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Seoul, April 14-19, 2024
14. Hugo Flores Garcia, Patrick O'Reilly, Aldo Aguilar, Bryan Pardo, Christodoulos Benetatos, Zhiyao Duan, "HARP: Bringing Deep Learning to the DAW with Hosted, Asynchronous, Remote Processing," Machine Learning for Creativity and Design, NeurIPS 2023, New Orleans, December 16, 2023
15. Hugo Flores Garcia, Prem Seetharaman, Rithesh Kumar, and Bryan Pardo, "VampNet: Music Generation via Masked Acoustic Token Modeling," International Society of Music Information

Retrieval Conference (ISMIR 2023), Milan, November 5-9, 2023

16. Noah Schaffer, Boaz Cogan, Ethan Manilow, Max Morrison, Prem Seetharaman, and Bryan Pardo, "Music Separation Enhancement with Generative Modeling," International Society of Music Information Retrieval Conference (ISMIR 2022), December 4-8, 2022
17. Patrick O'Reilly, Andreas Bugler, Keshav Bhandari, Max Morrison, and Bryan Pardo, "VoiceBlock: Privacy through Real-Time Adversarial Attacks with Audio-to-Audio Models," Thirty-sixth Conference on Neural Information Processing Systems (NeurIPS 2022), New Orleans, November 28 - December 9, 2022
18. Ethan Manilow, Patrick O'Reilly, Prem Seetharaman, Bryan Pardo, "Source Separation by Steering Pretrained Music Models," IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Singapore, May 22-27, 2022
19. Ethan Manilow, Curtis Hawthorne, Anna Huang, Bryan Pardo, Jesse Engel, "Improving Source Separation by Explicitly Modeling Dependencies Between Sources," IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Singapore, May 22-27, 2022
20. Patrick O'Reilly, Pranjal Awasthi, Aravindan Vijayaraghavan, Bryan Pardo "Effective and Inconspicuous Over-the-air Adversarial Examples with Adaptive Filtering," IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Singapore, May 22-27, 2022
21. M. Morrison, B. Tang, G. Tan, and B. Pardo, "Reproducible Subjective Evaluation," ICLR Workshop on Machine Learning Evaluation Standards, April 25-29, 2022.
22. Hugo Flores Garcia, Aldo Aguilar, Ethan Manilow, Bryan Pardo, "Leveraging Hierarchical Structures for Few-Shot Musical Instrument Recognition," International Society of Music Information Retrieval Conference (ISMIR 2021), November 8-11, 2021 **(Best Paper)**
23. Max Morrison, Lucas Rencker, Zeyu Jin, Nicholas Bryan, Juan-Pablo Caceres, Bryan Pardo, "Context-Aware Prosody Correction for Text-Based Speech Editing," IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Toronto, Canada, June 6-11, 2021
24. Alisa Liu, Prem Seetharaman, Bryan Pardo, "Model Selection for Deep Audio Source Separation via Clustering Analysis," Workshop on Detection and Classification of Acoustic Scenes and Events (DCASE 2020), Tokyo, Japan, Nov 2-3, 2020 **(Best Student Paper)**
25. Prem Seetharaman, Gordan Wichern, Bryan Pardo, Jonathan Le Roux, "Autoclip: Adaptive Gradient Clipping for Source Separation Networks," IEEE International Workshop on Machine Learning for Signal Processing (MLSP), September 21–24, 2020 Aalto University, Espoo, Finland
26. Prem Seetharaman, Gordon Wichern, Jonathan Le Roux, and Bryan Pardo, "Bootstrapping Unsupervised Deep Music Separation from Primitive Auditory Grouping Principles," Workshop on Self-supervision in Audio and Speech at the 37th International Conference on Machine Learning, Vienna, Austria, July 13-18, 2020
27. Alisa Liu, Alexander Fang, Gaetan Hadjeres, Prem Seetharaman, and Bryan Pardo, "Incorporating Music Knowledge in Continual Dataset Augmentation for Music Generation," Workshop on Machine Learning for Media Discovery at the 37th International Conference on Machine Learning, Vienna, Austria, July 13-18, 2020
28. Alexander Fang, Alisa Liu, Prem Seetharaman, and Bryan Pardo, "Bach or Mock? A Grading Function for Chorales in the Style of J.S. Bach," Workshop on Machine Learning for Media Discovery at the 37th International Conference on Machine Learning, Vienna, Austria, July 13-18, 2020
29. Ethan Manilow, Prem Seetharaman, and Bryan Pardo, "Simultaneous Separation and Transcription of Mixtures with Multiple Polyphonic and Percussive Instruments," IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Barcelona, Spain, May 4-8, 2020
30. Yichi Zhang, Junbo Hu, Yiting Zhang, Bryan Pardo and Zhiyao Duan, "Vroom!: A Search Engine for Sounds by Vocal Imitation Queries," ACM SIGIR Conference on Human Information Interaction and Retrieval (CHIIR), Vancouver, BC, Canada, March 14-18, 2020
31. Max Morrison, Bryan Pardo, "OtoMechanic: Auditory Automobile Diagnostics via Query-by-

Example," Workshop on Detection and Classification of Acoustic Scenes and Events (DCASE 2019), New York, NY, USA, Oct 25-26, 2019

32. Fatemeh Pishdadian, Bongjun Kim, Prem Seetharaman, Bryan Pardo, "Classifying non-speech vocals: Deep vs Signal Processing Representations," Workshop on Detection and Classification of Acoustic Scenes and Events (DCASE 2019), New York, NY, USA, Oct 25-26, 2019
33. Bongjun Kim and Bryan Pardo, "Sound Event Detection Using Point-labeled Data," IEEE Workshop on Applications of Signal Processing to Audio and Acoustics (WASPAA 2019), New Paltz, NY, USA, October 20-23, 2019
34. Bongjun Kim and Bryan Pardo, "Improving content-based audio retrieval by vocal imitation feedback," IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Brighton, UK, May 12-17, 2019
35. Prem Seetharaman, Gordon Wichern, Jonathan Le Roux, Bryan Pardo, "Bootstrapping single-channel source separation via unsupervised spatial clustering on stereo mixtures," IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Brighton, UK, May 12-17, 2019
36. Prem Seetharaman, Gautham Mysore, Bryan Pardo, P. Smaragdis, C. Gomes, "VoiceAssist: Guiding Users to High-Quality Voice Recordings," ACM CHI Conference on Human Factors in Computing Systems (CHI 2019), 4-9 May 2019, Glasgow, UK
37. Brian Margolis, Madhev Ghei, Bryan Pardo, "Applying Triplet Loss to Siamese-style Networks for Audio Similarity Rankings," Workshop on Detection and Classification of Acoustic Scenes and Events (DCASE 2018), 19-20 November 2018, Surrey, UK
38. Bongjun Kim, Madhav Ghei, Bryan Pardo, "Vocal Imitation Set: a dataset of vocally imitated sound events using the AudioSet ontology," Workshop on Detection and Classification of Acoustic Scenes and Events (DCASE 2018), 19-20 November 2018, Surrey, UK
39. Julia Wilkins, Prem Seetharaman, Alison Wahl, and Bryan Pardo, "VocalSet: A Singing Voice Dataset," International Society of Music Information Retrieval Conference (ISMIR 2018), Paris, France, September 23-27, 2018
40. Ethan Manilow, Prem Seetharaman, and Bryan Pardo, "The Northwestern University Source Separation Library," International Society of Music Information Retrieval Conference (ISMIR 2018), Paris, France, September 23-27, 2018
41. Mark Cartwright, Bryan Pardo, and Gautham Mysore, "Crowdsourced Pairwise Comparison for Source Separation Evaluation," IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Calgary, Alberta, Canada, April 15-20, 2018
42. Prem Seetharaman, Gautham Mysore, Paris Smaragdis, and Bryan Pardo, "Blind Estimation of the Speech Transmission Index for Speech Quality Prediction," IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Calgary, Alberta, Canada, April 15-20, 2018
43. Prem Seetharaman, Fatemeh Pishdadian, and Bryan Pardo, "Music/Voice Separation using the 2D Fourier Transform," IEEE Workshop on Applications of Signal Processing to Audio and Acoustics (WASPAA 2017), New Paltz, NY, USA, October 15-18, 2017
44. Ethan Manilow and Bryan Pardo, "Leveraging Repetition to Do Audio Imputation," IEEE Workshop on Applications of Signal Processing to Audio and Acoustics (WASPAA 2017), New Paltz, NY, USA, October 15-18, 2017
45. Ethan Manilow, Prem Seetharaman, Fatemeh Pishdadian, and Bryan Pardo, "Predicting Algorithm Efficacy for Adaptive Multi-Cue Source Separation," IEEE Workshop on Applications of Signal Processing to Audio and Acoustics (WASPAA 2017), New Paltz, NY, USA, October 15-18, 2017
46. Andrew Karp and Bryan Pardo, "HaptEQ: A Collaborative Tool for Visually Impaired Audio Producers," Audio Mostly Conference, London, UK, August 23-26, 2017
47. Michael Donovan, Prem Seetharaman, and Bryan Pardo, "A Web Audio Node for the Fast Creation of Natural Language Interfaces for Audio Production," Proceedings of the 3rd Web Audio Conference, London, UK, August 21-23, 2017

48. Bongjun Kim and Bryan Pardo, “I-Sed: An Interactive Sound Event Detector,” International Conference on Intelligent User Interfaces (IUI 2017), Limassol, Cyprus, March 13 - 16, 2017, pp. 553-557, DOI 10.1145/3025171.3025231
49. Fatemeh Pishdadian and Bryan Pardo, “A multi-resolution approach to common fate-based audio separation,” IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), New Orleans, LA, USA, March 5-9, 2017, DOI 10.1109/ICASSP.2017.7952219
50. Robin Brewer, Mark Cartwright, Andrew Karp, Bryan Pardo, A.M. Piper, “An Approach to Audio-Only Editing for Visually Impaired Seniors,” ACM SIGACCESS Conference on Computers and Accessibility (ASSETS), Reno, Nevada, USA, October 24-26, 2016
51. Taylor Zheng, Prem Seetharaman and Bryan Pardo, "SocialFX: Studying a Crowdsourced Folksonomy of Audio Effects Terms," ACM Multimedia 2016, October 15-19, 2016, Amsterdam, Netherlands
52. Prem Seetharaman and Bryan Pardo, “Simultaneous Separation and Segmentation in Layered Music,” International Society of Music Information Retrieval Conference (ISMIR 2016), New York, NY, USA, August 7-11, 2016
53. Mark Cartwright and Bryan Pardo, “The Moving Target in Creative Interactive Machine Learning,” Workshop on Human Centered Machine Learning (HCML) at the ACM Conference on Human Factors in Computing Systems (CHI 2016), San Jose, California, USA, May 7, 2016
54. Mark Cartwright, Bryan Pardo, Gautham Mysore and Matt Hoffman, “Fast and Easy Crowdsourced Perceptual Audio Evaluation,” IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Shanghai, China, March 20-25, 2016, DOI: 10.1109/ICASSP.2016.7471749
55. Jon Ford, Mark Cartwright and Bryan Pardo, “MixViz: A Tool to Visualize Masking in Audio Mixes,” The 139th International Audio Engineering Society Convention (AES). New York, NY, USA, Oct 29 – Nov 1, 2015
56. Zafar Rafii and Bryan Pardo, “A simple user interface system for recovering patterns repeating in time and frequency in mixtures of sounds,” IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Brisbane, Australia, April 19-24, 2015
57. Mark Cartwright and Bryan Pardo,”Vocal Sketch: Vocally Imitating Audio Concepts,” ACM Computer Human Interaction Conference (CHI 2015), Seoul, Korea, April 18-23, 2015 BEST PAPER HONORARY MENTION
58. Bongjun Kim and Bryan Pardo, “Speeding Learning of Personalized Audio Equalization,” International Conference on Machine Learning and Applications (ICMLA), Detroit, Michigan, December 3-5, 2014
59. Bongjun Kim and Bryan Pardo, “Adapting Collaborative Filtering to Personalized Audio Production,” AAAI Conference on Human Computation and Crowdsourcing (HCOMP), Pittsburgh, Pennsylvania, November 2-4, 2014
60. Prem Seetharaman and Bryan Pardo, “Crowdsourcing a Reverberation Descriptor Map”, ACM Multimedia 2014, Orlando, Florida, November 3-7, 2014
61. Mark Cartwright and Bryan Pardo, “SynthAssist: Querying an Audio Synthesizer by Vocal Imitation,” 14th International Conference on New Interfaces for Musical Expression (NIME), London, UK, June 30- July 4, 2014
62. Mark Cartwright and Bryan Pardo, “Translating Sound Adjectives by Collectively Teaching Abstract Representations,” Collective Intelligence 2014 Conference, Boston MA, June 10-12, 2014
63. Antoine Liutkus, Zafar Rafii, Bryan Pardo, Derry Fitzgerald, Laurent Daudet, “Kernel spectrogram models for source separation,” 4th Joint Workshop on Hands-free Speech Communication and Microphone Arrays (HSCMA), Nancy, France, May 12-14, 2014
64. Zhiyao Duan, Bryan Pardo, Laurent Daudet, “A Novel Cepstral Representation for Timbre Modeling of Sound Sources in Polyphonic Mixtures,” IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Florence, Italy, May 4-9, 2014
65. Mark Cartwright, Bryan Pardo, Josh Reiss, “MIXPLORATION: Rethinking the Audio Mixer

Interface," International Conference on Intelligent User Interfaces (IUI 2014), Haifa, Israel, 24-27 February, 2014

66. Mark Cartwright and Bryan Pardo, "SocialEQ: Crowdsourcing an Equalization Descriptor Map," International Society of Music Information Retrieval Conference (ISMIR 2013), Curitiba, PR, Brazil, 4-8 November, 2013
67. Zafar Rafii and Bryan Pardo, "Online RPET-SIM for Real-time Speech Enhancement," IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Vancouver, B.C. Canada, May 26-31, 2013
68. Bryan Pardo, David Little and Darren Gergle, "Building a Personalized Audio Equalizer Interface with Transfer Learning and Active Learning," 2nd International ACM Workshop on Music Information Retrieval with User-Centered and Multimodal Strategies (MIRUM), Nara, Japan November 2, 2012
69. Mark Cartwright and Bryan Pardo, "Novelty Measures as Cues for Temporal Salience in Audio Similarity," 2nd International ACM Workshop on Music Information Retrieval with User-Centered and Multimodal Strategies (MIRUM), Nara, Japan November 2, 2012
70. Zafar Rafii and Bryan Pardo, "Music/Voice Separation Using the Similarity Matrix," International Society of Music Information Retrieval Conference (ISMIR 2012), Porto, Portugal, October 8-12, 2012
71. Jinyu Han, Gautham Mysore and Bryan Pardo, "Language Informed Bandwidth Expansion," IEEE International Workshop on Machine Learning for Signal Processing (MLSP 2012), Santander, Spain, September 23-26, 2012
72. Mark Cartwright and Bryan Pardo, "Building a Music Search Database Using Human Computation," Sound and Music Computing Conference (SMC 2012), Copenhagen, Denmark, July 12-14, 2012
73. Bryan Pardo, David Little and Darren Gergle, "Towards Speeding Audio EQ Interface Building with Transfer Learning," Proceedings of New Interfaces for Musical Expression (NIME) 2012, Ann Arbor, MI, USA, May 21-23, 2012
74. Antoine Liutkus, Zafar Rafii, R. Badeau, Bryan Pardo and Gael Richard, "Adaptive Filtering for Music/Voice Separation Exploiting the Repeating Musical Structure," IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Kyoto, Japan, March 25-30, 2012
75. Jinyu Han, Gautham Mysore and Bryan Pardo, "Audio Imputation using the Non-negative Hidden Markov Model," LVA ICA 2012, The 10th International Conference on Latent Variable Analysis and Signal Separation, Tel-Aviv Israel, March 12-15, 2012
76. Mark Cartwright and Bryan Pardo, "Interactive Learning for Creativity Support in Music Production," Semi-Automated Creativity Workshop at ACM Creativity and Cognition, Atlanta, GA, USA, November 3-6, 2011
77. Zhiyao Duan and Bryan Pardo, "Aligning Semi-improvised Music Audio with its Lead Sheet," International Society of Music Information Retrieval Conference (ISMIR 2011), Miami, FL, USA, October 24-28, 2011
78. Mark Cartwright, Zafar Rafii, Jinyu Han, and Bryan Pardo. "Making Searchable Melodies: Human vs. Machine," 2011 AAAI Workshop on Human Computation, San Francisco, USA. August 8, 2011
79. David Little, Bryan Pardo, Beverly Wright, "A Computational Model of Auditory Perceptual Learning: Predicting Learning Interference Across Multiple Tasks," Proceedings of CogSci 2011, Boston, MA, USA, July 20 - 23, 2011
80. Zhiyao Duan and Bryan Pardo, "A State Space Model for Online Polyphonic Audio-Score Alignment," IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Prague, Czech Republic, May 22-27, 2011
81. Jinyu Han and Bryan Pardo, "Reconstructing Completely Overlapped Notes from Musical Mixtures," IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Prague, Czech Republic, May 22-27, 2011
82. Zafar Rafii and Bryan Pardo, "A Simple Music/Voice Separation Method Based on the Extraction of

the Repeating Musical Structure," IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Prague, Czech Republic, May 22-27, 2011

83. Zafar Rafii and Bryan Pardo, "Degenerate Unmixing Estimation Technique Using the Constant Q Transform," IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Prague, Czech Republic, May 22-27, 2011
84. Eduard Scott, Pubudu M. Silva, Bryan Pardo, and Thrasyvoulos N. Pappas, "Adaptive user interfaces for relating high-level concepts to low-level photographic parameters," in Human Vision and Electronic Imaging XVI Proc. SPIE vol. 7865, San Francisco, CA, pp. 786510-1-12, January, 2011.
85. David Little and Bryan Pardo, "Computational Models of Perceptual Learning Across Multiple Auditory Tasks: Modeling Daily Learning Limits as Memory Decay," Proceedings of the 10th International Conference on Cognitive Modeling (ICCM), Philadelphia, PA, Aug 5, 2010
86. Arefin Huq, Mark Cartwright and Bryan Pardo, "Crowdsourcing a Real-world On-line Query by Humming System," Sound and Music Computing Conference (SMC 2010), Barcelona, Spain, July 21-24, 2010
87. Zhiyao Duan, Jinyu Han and Bryan Pardo, "Song Level Multi-pitch Tracking by Heavily Constrained Clustering," IEEE International Conference on Acoustics, Speech and Signal Processing, Dallas, TX, March 14-19, 2010
88. Zafar Rafii and Bryan Pardo, " Learning to Control A Reverberator Using Subjective Perceptual Descriptors," International Society of Music Information Retrieval Conference (ISMIR 2009), Kobe, Japan, October 26-30, 2009
89. Zhiyao Duan, Jinyu Han and Bryan Pardo, "Harmonically Informed Multi-pitch Tracking," International Society of Music Information Retrieval Conference (ISMIR 2009), Kobe, Japan October 26-30, 2009
90. Andrew Sabin and Bryan Pardo, "2DEQ: An Intuitive Audio Equalizer," Proceedings of ACM Creativity and Cognition 2009, Berkeley, CA, October 27-29, 2009
91. Andrew Sabin and Bryan Pardo, "'A method for rapid personalization of audio equalization parameters," ACM Multimedia 2009, Beijing, China, October 19 - 24, 2009
92. Jinyu Han and Bryan Pardo, "Improving Separation of Harmonic Sources with Iterative Estimation of Spatial Cues," 2009 IEEE Workshop on Applications of Signal Processing to Audio and Acoustics, New Paltz, NY, USA, October 18-21, 2009
93. Jana Zujovic, Lisa Gandy, Scott Friedman, Bryan Pardo, and Thrasyvoulos Pappas, "Classifying Paintings by Artistic Genre: An Analysis of Features & Classifiers," International Workshop on Multimedia Signal Processing - MMSP'09, Rio de Janeiro, Brazil, October 5-7, 2009
94. Benjamin Duane and Bryan Pardo, "Streaming from MIDI using constraint satisfaction optimization and sequence alignment," International Computer Music Conference (ICMC 2009), Montreal, CA, August 16-21, 2009
95. Jiahui Liu, Larry Birnbaum and Bryan Pardo, "Spectrum: Retrieving Different Points of View from the Blogosphere ," International AAAI Conference on Weblogs and Social Media(ICWSM 2009), San Jose, California, May 17 - 20, 2009
96. Jiahui Liu, Larry Birnbaum and Bryan Pardo, "Categorizing Bloggers' Interests: Methods and Applications," ACM 17th Conference on Information and Knowledge Management (CIKM 2008), Napa Valley, CA, USA, October 26-30, 2008
97. Michael Skalak, Jinyu Han, Bryan Pardo, "Speeding Melody Search with Vantage Point Trees," International Society of Music Information Retrieval Conference(ISMIR 2008), Philadelphia, PA, USA, September 14-18, 2008
98. David Little and Bryan Pardo, "Learning Musical Instruments from Polyphonic Audio with Weak Labels," International Society of Music Information Retrieval Conference (ISMIR 2008), Philadelphia, USA, September 14-18, 2008
99. Yan Gao, Ming Yang, Xiaonan Zhao, Bryan Pardo, Ying Wu, Thrasyvoulos Pappas, Alok Choudhary,

"Image Spam Hunter," IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP 2008), Las Vegas, Nevada, USA, March 30 – April 4, 2008

100. Nathan Nichols, Jiahui Liu, Bryan Pardo, Kris Hammond and Larry Birnbaum, "Learning to Gesture: Applying Appropriate Animations to Spoken Text," ACM Multimedia 2007, Augsburg, Germany, September 24 – 29, 2007

101. David Little, David Raffensperger, Bryan Pardo, "A Query by Humming System that Learns from Experience," International Society of Music Information Retrieval Conference (ISMIR 2007), Vienna, Austria, September 23-27, 2007

102. Brendan Fox, Andrew Sabin, Bryan Pardo, Alec Zopf, "Modeling Perceptual Similarity of Audio Signals for Blind Source Separation Evaluation," International Conference on Independent Component Analysis and Signal Separation, London, England, September 9-12, 2007

103. Brendan Fox and Bryan Pardo, "Towards a Model of Perceived Quality of Blind Audio Source Separation," IEEE International Conference on Multimedia and Expo (ICME 2007), Beijing, China, July 2-5, 2007

104. David Little, David Raffensperger, and Bryan Pardo. "User specific training of a music search engine," Machine Learning and Multimodal Interaction: Fourth International Workshop, MLMI 2007, Brno, CZ, June 28-30, 2007, Lecture Notes in Computer Science. Springer, 2007

105. Bryan Pardo, "Design considerations for technology to support music improvisation ," Creativity and Cognition Conference Workshop on Supporting Creative Acts Beyond Dissemination, Washington DC, USA, June 13-15, 2007

106. Bryan Pardo and David Shamma, "Teaching a Music Search Engine Through Play," CHI 2007 Workshop on Vocal Interaction in Assistive Technologies and Games (CHI 2007), San Jose, CA, USA, April 29 – May 3, 2007

107. David Shamma and Bryan Pardo, " Karaoke Callout: using social and collaborative cell phone networking for new entertainment modalities and data collection," ACM Multimedia Workshop on Audio and Music Computing for Multimedia (AMCMM 2006), Santa Barbara, CA, USA, October 23-27, 2006

108. John Woodruff, Bryan Pardo and Roger Dannenberg, "Remixing Stereo Music with Score-informed Source Separation," International Society of Music Information Retrieval Conference (ISMIR 2006), Victoria, Canada, October 8-12, 2006

109. David Shamma, Bryan Pardo, and K. Hammond, "MusicStory: a Personalized Music Video Creator," ACM Multimedia 2005, Singapore, November 6-11, 2005

110. Bryan Pardo and Manan Sanghi, "Polyphonic Musical Sequence Alignment for Database Search," in International Conference on Music Information Retrieval, London, England, September 11-15, 2005

111. Bryan Pardo and William Birmingham, "Modeling Form for On-line Following of Musical Performances," Twentieth National Conference on Artificial Intelligence (AAAI), Pittsburgh, Pennsylvania, July 9-13, 2005

112. Bryan Pardo, "Tempo Tracking with a Single Oscillator," International Society of Music Information Retrieval Conference (ISMIR 2004), Barcelona, October 10-14, 2004

113. Roger Dannenberg, William Birmingham, George Tzanetakis, Colin Meek, Ning Hu, and Bryan Pardo, "The MUSART testbed for query-by-humming evaluation," International Society of Music Information Retrieval Conference (ISMIR 2003), Baltimore, Maryland, October 26-30, 2003

114. Bryan Pardo and William Birmingham, "Query by Humming: How good can it get?," Workshop on Music Information Retrieval, SIGIR 2003, Toronto, Canada, July 28 - August 1, 2003

115. Bryan Pardo and William Birmingham, "Encoding Timing Information for Musical Query Matching," International Society of Music Information Retrieval Conference (ISMIR 2002), Paris, France, October 13-17, 2002

116. Bryan Pardo and William Birmingham, "Improved Score Following for Acoustic Performances," in International Computer Music Conference, Gothenburg, Sweden, September 16-20, 2002

117. Jonah Shifrin, Bryan Pardo, Colin Meek, and William Birmingham, "HMM-Based Musical Query Retrieval," ACM/IEEE Joint Conference on Digital Libraries, Portland, Oregon, USA, July 14-18, 2002

118. Bryan Pardo, Colin Meek, and William Birmingham, "Comparing Aural Music-Information Retrieval Systems," Workshop on the Creation of Standardized Test Collections, Tasks, and Metrics for Music Information Retrieval (MIR) and Music Digital Library (MDL) Evaluation. Joint Conference on Digital Libraries, Portland, Oregon, USA, July 14-18, 2002

119. Bryan Pardo and William Birmingham, "Following a Musical Performance from a Partially Specified Score," Multimedia Technology and Applications Conference, Irvine, California, November, 2001

120. C. Mitchell, C. Menezes, J. Williams, Bryan Pardo, D. Erickson, and O. Fujumura, "Changes in Syllable and Boundary Strengths due to Irritation," ISCA Workshop on Speech and Emotion, Belfast, September 2000

121. Bryan Pardo and William Birmingham, "On the computational properties of harmonic analysis," Workshop on Artificial Intelligence and Music, AAAI 2000, Austin, TX, July 2000

122. Bryan Pardo and William Birmingham, "Automated Partitioning of Tonal Music," International FLAIRS Conference, Orlando, Florida, May 2000

123. Osamu Fujimura, Bryan Pardo, Donna Erickson, "Effect of Emphasis and Irritation on Jaw Opening," in Proceedings of ESCA 98, Aix en Provence, France, September, 1998

**REFEREED JOURNALS**

1. Vivian Tang, Prem Seetharaman, Kevin Chao, Bryan Pardo, and Suzan van der Lee, Automating the Detection of Dynamically Triggered Earthquakes via a Deep Metric Learning Algorithm, Seismological Research Letters, January 2020.

2. Bryan Pardo, Mark Cartwright, Prem Seetharaman, and Bongjun Kim, "Learning to Build Natural Audio Production Interfaces," Arts, Arts 2019, vol. 8(3), 110; https://doi.org/10.3390/arts8030110

3. Fatemeh Pishdadian, and Bryan Pardo, "Multi-resolution Common Fate Transform," ACM/IEEE Transactions on Audio, Speech and Language Processing, vol. 27 (2), February 2019, DOI: 10.1109/TASLP.2018.2878616

4. Meinard Mueller, Bryan Pardo, Gautham Mysore, and Vesa Valimaki, "Recent Advances in Music Signal Processing," IEEE Signal Processing Magazine, vol. 36 (1), January 2019, DOI: 10.1109/MSP.2018.2876190

5. Yichi Zhang, Zhiyao Duan, and Bryan Pardo, "Siamese Style Convolutional Neural Networks for Sound Search by Vocal Imitation," ACM/IEEE Transactions on Audio, Speech and Language Processing, September 2018, DOI: 10.1109/TASLP.2018.2868428

6. Zafar Rafii, Antoine Liutkus, Fabian Stoter, Stylianos Mimilakis, Derry FitzGerald, and Bryan Pardo, "An Overview of Lead and Accompaniment Separation in Music," ACM/IEEE Transactions on Audio, Speech and Language Processing, vol. 26 (8), August 2018, DOI: 10.1109/TASLP.2018.2825440

7. Bongjun Kim and Bryan Pardo, "A Human-in-the-loop System for Sound Event Detection and Annotation," ACM Transactions on Interactive Intelligent Systems, vol. 8 (2), July 2018 Article No. 13, DOI: 10.1145/3214366

8. Prem Seetharaman and Bryan Pardo, "Audealize: Crowdsourced Audio Production Tools," Journal of the Audio Engineering Society, pp. 419-430, vol. 64 (9), September 2016, DOI: http://dx.doi.org/10.17743/jaes.2016.0037

9. F. J. Rodriguez-Serrano, Zhiyao Duan, P. Vera-Candeas, Bryan Pardo, J. Carabias-Orti, "Online score-informed source separation with adaptive instrument models," Journal of New Music Research, vol. 4(22), 2015, DOI 10.1080/09298215.2014.989174

10. Zafar Rafii, Zhiyao Duan, Bryan Pardo, "Combining Rhythm-based and Pitch-based Methods for Background and Melody Separation," ACM/IEEE Transactions on Audio, Speech and Language Processing, pp. 1884-1893, vol. 22(12), December 2014, DOI: 10.1109/TASLP.2014.2354242

11. Liutkus, D. Fitzgerald, Zafar Rafii, Bryan Pardo, Laurent Daudet, “Kernel additive models for source separation,” IEEE Transactions on Signal Processing, pp. 4298-4310, vol. 62(16), 2014, DOI: 10.1109/TSP.2014.2332434
12. Sebastian Ewert, Bryan Pardo, Meinard Muller, and Mark Plumbley, “Score-Informed Source Separation for Musical Audio Recordings: An overview,” IEEE Signal Processing Magazine – Special Issue on Source Separation and Applications, pp. 116-124, vol. 31(3), May 2014, DOI 10.1109/MSP.2013.2296076
13. Zhiyao Duan, Jinyu Han, Bryan Pardo, “Multi Pitch Streaming of Harmonic Sound Mixtures,” IEEE Transactions on Audio, Speech and Language Processing, pp. 138-150, vol. 22(1), 2014
14. Zafar Rafii, Bryan Pardo, “REpeating Pattern Extraction Technique (REPET): A Simple Method for Music/Voice Separation,” IEEE Transactions on Audio, Speech and Language Processing, pp. 71-82, vol. 21(1), 2013, DOI: 10.1109/TASL.2012.2213249
15. Zhiyao Duan, Bryan Pardo, “Soundprism: An Online System for Score-informed Source Separation of Music Audio,” Journal of Selected Topics in Signal Processing, pp. 1205-1215, vol. 5(6), 2011
16. Andrew Sabin, Zafar Rafii, Bryan Pardo, “Weighting function-based rapid mapping of descriptors to audio processing parameters,” Journal of the Audio Engineering Society, pp. 419-430, vol. 59(6), 2011
17. Zhiyao Duan, Bryan Pardo and C. Zhang, “Multiple Fundamental Frequency Estimation by Modeling Spectral Peaks and Non-peak Areas,” IEEE Transactions on Audio, Speech and Language Processing, vol. 18(8), pp. 2121 – 2133, 2010, DOI: 10.1109/TASL.2010.2042119
18. John Woodruff and Bryan Pardo, “Using Pitch, Amplitude Modulation and Spatial Cues for Separation of Harmonic Instruments from Stereo Music Recordings,” EURASIP Journal on Advances in Signal Processing, vol. 2007, Article ID 86369, 2007
19. Roger Dannenberg, William Birmingham, Bryan Pardo, N. Hu, C. Meek, G. Tzanetakis, “A Comparative Evaluation of Search Techniques for Query-by-Humming Using the MUSART Testbed,” Journal of the American Society for Information Science and Technology, vol. 58 (3), 2007
20. Bryan Pardo, “Music Information Retrieval,” Communications of the ACM, vol. 49 (8), pp. 29-31, 2006
21. William Birmingham, Roger Dannenberg, Bryan Pardo, “An Introduction to Query by Humming with the VocalSearch System,” Communications of the ACM, vol. 49 (8), pp. 49-52, 2006
22. Bryan Pardo, “Finding Structure in Audio for Music Information Retrieval,” IEEE Signal Processing Magazine, vol. 23(3), pp. 126-132, 2006
23. Roger Dannenberg, William Birmingham, George Tzanetakis, Colin Meek, Ning Hu, and Bryan Pardo, “The MUSART Testbed for Query-By-Humming Evaluation, “ Computer Music Journal, vol. 28 (2), pp. 34-48, 2004
24. Bryan Pardo, William Birmingham, and Jonah Shifrin, “Name that Tune: A Pilot Study in Finding a Melody from a Sung Query,” Journal of the American Society for Information Science and Technology, vol. 55 (4), pp. 283-300, 2004
25. Caroline Menezes, Bryan Pardo, Donna Erickson, and Osamu Fujimura, “Changes in Syllable Magnitude and Timing due to Repeated Correction,” Speech Communication, vol. 40, issue 1-2, pp. 71-85, 2003
26. Bryan Pardo and William Birmingham, “Algorithms for Chordal Analysis,” Computer Music Journal, vol. 26 (2), pp. 27-49, 2002
27. Donna Erickson, Osamu Fujimura, and Bryan Pardo, “Articulatory Correlates of Prosodic Control: Emotion and Emphasis,” Language and Speech, vol. 41 (3-4), pp. 395-413, 1998

**BOOK CHAPTERS**

1. Bryan Pardo, Zafar Rafii, and Zhiyao Duan, “Audio source separation in a musical context,” in Springer Handbook of Systematic Musicology, Springer-Verlag Berlin Heidelberg, 2017.
2. Bryan Pardo, Antoine Liutkus, Zhiyao Duan, Gael Richard, “Applying source separation to music,” in

Audio Source Separation and Speech Enhancement, eds. E. Vincent, T. Virtanen, S. Gannot. Wiley, 2017.

3. Zafar Rafii, Antoine Liutkus, Bryan Pardo, "REPET for Background/Foreground Separation in Audio, " in Blind Source Separation Signals and Communication Technology, 2014, pp 395-411
4. David Shamma, Bryan Pardo and John Woodruff, " MusicStory: An Autonomous, Personalized Music Video Creator," in Intelligent Music Information Systems-Tools and Methodologies, Idea Group Reference, ISBN-13: 978-1599046631, August, 2007

**PAPERS REVIEWED ON EXTENDED ABSTRACTS**

1. Mark Cartwright and Bryan Pardo, "Audio Production with Intelligent Machines," Collaborating with Intelligent Machines: Interfaces for Creative Sound Workshop at CHI 2015, April 18, 2015
2. Mark Cartwright and Bryan Pardo, "SynthAssist: An Audio Synthesizer Programmed With Vocal Imitation," ACM Multimedia 2014, Orlando, Florida, November 3-7, 2014
3. Prem Seetharaman and Bryan Pardo, "Reverbalize: A crowdsourced reverberation controller," ACM Multimedia 2014, Orlando, Florida, November 3-7, 2014
4. J. Spring, Zhiyao Duan, and Bryan Pardo, "Approaches to Multiple Concurrent Species Birdsong Recognition," The 2nd International Workshop on Machine Listening in Multisource Environments (CHIME), Vancouver, Canada, June 1, 2013
5. Michael Greenberg, Karthic Hariharan, Elizabeth Gerber, and Bryan Pardo, "Crowdfunding Support Tools: Predicting Success & Failure," Works-in-progress, Computer Human Interaction Conference (CHI 2013), Paris, France, April 2013
6. Andrew Sabin and Bryan Pardo, " Rapid learning of Subjective Preference in Equalization," 125th meeting of the Audio Engineering Society, San Francisco, CA, October 2-5
7. C. Menezes, D. Erickson, J. McGory, Bryan Pardo, and Osamu Fujimura, "An Articulatory and Perceptual Study of Phrasing," ISCA Workshop on Speech Perception, Aix-en-Provence, France, April 8-10, 2002
8. Bryan Pardo, and J. Josephson, "A study of the Patterson and Holdsworth auditory model and its utility in automated recognition of the plosive consonants," Journal of the Acoustical Society of America, Vol. 95, No. 5, Pt. 2, May 1994

**TECHNICAL REPORTS**

1. David Little and Bryan Pardo, "Online Training of a Music Search Engine," Northwestern University, EECS Department Technical Report NWU-EECS-07-03, 2007
2. John Woodruff and Bryan Pardo, "Active Source Estimation for Improved Source Separation," Northwestern University, EECS Department Technical Report NWU-EECS-06-01, 2006
3. Bryan Pardo and William Birmingham, "The Chordal Analysis of Tonal Music," University of Michigan, EECS Department Technical Report CSE-TR-439-01, 2001

**UNREFEREED MAGAZINE ARTICLES**

1. William Birmingham, Colin Meek, Kevin O'Malley, Bryan Pardo, and Jonah Shifrin, "Music Information Retrieval Systems," Dr. Dobbs Journal, September 2003, pp. 50-53
2. William Birmingham, Bryan Pardo, C.olinMeek, and Jonah Shifrin, "The MusArt Music-Retrieval System: An Overview," D-lib Magazine, February 2002, 8 (2)

**PATENTS**

1. Noah L. Liebman, Darren R. Gergle, Bryan A. Pardo, "Visualizing auditory masking in multitrack audio recording," US20230300558A1
2. Maxwell Morrison, Juan Pablo Caceres Chomali, Zeyu Jin, Nicholas Bryan, Bryan A Pardo, "Neural Pitch Shifting and Time Stretching" US20230197093A1
3. Prem Seetharaman, Gautham Mysore, Bryan Pardo, " Sound quality prediction and interface to

facilitate high-quality voice recordings," U.S. Patent Pending.

4. Mark Cartwright, Bryan Pardo, "Systems, Methods, and Apparatus to Search Audio Synthesizers using Vocal Imitation," U.S. Patent No. 9,390,695
5. Zafar Rafii, Bryan Pardo, "Audio Separation System and Method, "U.S. Patent No. 9,093,056
6. Andrew Todd Sabin, Bryan Pardo, "Systems, Methods, and Apparatus for Equalization Preference Learning," U.S. Patent No. 8,565,908

# INVITED LECTURES AND SEMINARS

1. May 9, 2025, DePaul University, "AI in the Arts"
2. October 23, 2024, Chicago Audio Engineering Society, "The Future is Hear: Innovations from the Interactive Audio Lab"
3. October 7, 2024, Princeton, Computer Science, "The Future is Hear: Innovations from the Interactive Audio Lab"
4. September 17, 2024, University of Michigan, CSE, "The Future is Hear: Innovations from the Interactive Audio Lab"
5. June 8, 2024, Audio Engineering Society Symposium on AI and the Musician, " Generative, Interactive Compositional Techniques for Sonic Art with HARP and VampNet"
6. June 12, 2023, Simons Institute, University of California, Berkeley, "Music Generation via Masked Acoustic Token Modeling"
7. March, 2023, New York University, ECE, "The Future is Hear: Innovations from the Interactive Audio Lab"
8. December 8, 2021, University of California, EECS, "Learning to isolate sounds from an audio scene without training from ground-truth"
9. December 7, 2021, University of California, School of Information, "Learning to Build Natural Audio Production Interfaces"
10. December 1, 2021 Allen Institute for Artificial Intelligence, "The Future is Hear: Empowering Audio Content Search, Creation and Manipulation with ML"
11. October 27, 2021, Bay Innovative Signal Hackers Bash (BISH Bash), "What's happening at the Interactive Audio Lab"
12. August 10, 2021, Shure, "Recent work in Speech and Audio Processing"
13. July 13, 2021, 2021 National Association of Black Journalists convention, "Deep Fakes, Genuine Journalism Concerns"
14. October 20, 2020, AIPLA Partnering in Patents Conference, "AI, HCI and Machine Learning in the Creative Arts"
15. September 29, 2020, Audio Engineering Society Symposium: Applications of Machine Learning in Audio, "Using machine learning to improve voice recording, remix music and transcribe melodies"
16. August 27, 2020, Reunion Internacional de Inteligencia Artificial y sus Aplicaciones RIIAA Conference, "HCAI to empower musical creativity"
17. March 6, 2020, Stanford University CCRMA, "Two recent projects: Voice assist and Cerberus"
18. February 7, 2020, Pandora, "Recent work in automated transcription and separation of music recordings"
19. March 6, 2019, University of Chicago, "Audio source separation models that learn without ground truth and are open to user correction"
20. September 7, 2017, IRCAM, Paris, France, "Leveraging the Two-dimensional Fourier Transform for Audio Source Separation"

21. September 6, 2017, IRCAM, Paris, France, “Crowdsourcing Audio Production Interfaces”
22. August 28, 2017, Fraunhofer Institute, Erlangen, Germany, “Deep Learning for Audio Applications”
23. October 27, 2016, University of Illinois, Chicago, “How I think about Intelligent Production Tools”
24. April 13, 2016, University of Rochester, ECE, “Crowdsourcing Audio Production Interfaces”
25. September 13, 2016, Keynote speech: AES Intelligent Music Production Workshop, London, UK, “How I think about Intelligent Production Tools”
26. February 16, 2016, University of Michigan, Performing Arts and Technologies, “Crowdsourcing Audio Production Interfaces”
27. January 7, 2016, Microsoft Research, Redmond, WA, “Crowdsourcing Audio Production Interfaces”
28. July 29, 2015, Shure, Niles, IL, “Crowdsourcing Audio Production Interfaces”
29. July 2, 2015, Starkey, Minneapolis, MI, “Crowdsourcing Audio Production Interfaces”
30. September 5, 2014, Gracenote, Emeryville, CA, “Crowdsourcing Audio Production Interfaces”
31. September 4, 2014, Adobe, San Francisco, CA, “Crowdsourcing Audio Production Interfaces”
32. August 25, 2014, Stanford University CCRMA, “Crowdsourcing Audio Production Interfaces”
33. March 21, 2014, Music Tech Fest, Boston, MA, “Crowdsourcing Audio Production Interfaces”
34. March 18, 2014, Izotope, Boston MA, “Crowdsourcing Audio Production Interfaces”
35. September 11, 2013, Microsoft Research New England, “Crowdsourcing Audio Production Interfaces”
36. June 28, 2013, Google London, “Computer Audition - Analyzing Complex Auditory Scenes”
37. June 26, 2013, Workshop on Software and Data for Audio and Music Research, “Tunebot: Software development, data sharing and data protection in an academic environment”
38. June 18, 2013, City University of London, “Computer Audition - Analyzing Complex Auditory Scenes”
39. June 13, 2013, Telecom Paris Tech, “Computer Audition - Analyzing Complex Auditory Scenes”
40. June 10, 2013, ACM Multimedia Program Committee Workshop, “SocialEQ: learning an audio production interface from the user”
41. May 20, 2013, Imperial College, Electrical Engineering, “Leveraging Repetition to Parse the Audio Scene”
42. May 11, 2013, University of Chicago Tedx Talk, “Teaching Machines to Listen”
43. May 1, 2013, Queen Mary University of London, Electric Engineering and Computer Science, “Leveraging Repetition to Parse the Audio Scene”
44. November 13, 2012, University of Illinois at Urbana-Champaign, Computer Science, “Teaching Machines to Listen”
45. November 8, 2012, Georgia Institute of Technology, School of Music, “Teaching Machines to Listen”
46. March 19, 2012, University of Michigan, Electrical Engineering and Computer Science, “Recent work in Audio Source Separation and Adaptive Audio Interfaces”
47. January 11, 2012, University of Central Florida, Electrical Engineering and Computer Science, “Tunebot and iQ: Music Software that Listens”
48. November 12, 2011, Eastman School of Music, “ Tunebot and Soundlearner: How teaching machines music makes musicians’ lives better”
49. March 23, 2011, New York University, School of Music, “Reconstructing Completely Overlapped Notes from Musical Mixtures”
50. May 27, 2010, Union College, Computer Science “Tunebot and Karaoke Callout”

51. March 27, 2009, Princeton, Computer Science, “Teaching Machines to Listen”
52. March 23, 2009, New York University, School of Music, “Teaching Machines to Listen”
53. January 16, 2009, National Science Foundation Sponsored CreativeIT Program PI Meeting, Arlington, VA, “Adaptive Interfaces for Musical Expression”
54. October 20, 2008, University of Texas at Austin, Computer Science, “Teaching Machines to Listen”
55. October 10, 2008, Arizona State University, Arts, Media and Engineering, “Teaching Machines to Listen”
56. October 3, 2008, Indiana University, School of Informatics, “Separation of Harmonic Instruments from Stereo Music Recordings”
57. August 14, 2008, Yahoo! Research, Santa Clara, CA, “Adaptive Interfaces for Musical Expression”
58. August 12, 2008, Sony Gracenote, Emeryville, CA, “Teaching Machines to Listen” April 29, 2008, The Ohio State University, Computer Science and Engineering “Teaching Machines to Listen”
59. March 25, 2008, Georgia Institute of Technology, Literature Communication and Culture, “Teaching Machines to Listen”
60. March 21, 2008, University of Miami, Electrical and Computer Engineering, “Teaching Machines to Listen”
61. March 20, 2008, University of Miami, Music Engineering Technology Colloquium, “Separation of Harmonic Instruments from Stereo Music Recordings”
62. September 13, 2007, University of Edinburgh, Music, Informatics and Cognition Seminar Series, “Separation of Harmonic Instruments from Stereo Music Recordings”
63. October 20, 2006, Stanford University, Center for Computer Research in Music and Acoustics, Hearing Seminar, “Harmonic source separation using pitch, amplitude, and spatial cues”
64. October 20, 2006, Yahoo! Research, Berkeley, CA, “Harmonic source separation and query-by-humming: new tools for music information retrieval and interaction”
65. October 19, 2006, Gracenote, Emeryville, CA, “Harmonic source separation and query-by-humming: new tools for music information retrieval and interaction”
66. October 18, 2006, Dolby Labs, San Francisco, CA, “Harmonic source separation using spatial cues”
67. October 13, 2006, Microsoft Research, Redmond, WA, “Music Information Retrieval: Query-By-Humming and Source Estimation”
68. September 27, 2006, Chicago Chapter of the ACM, DePaul University, Chicago, IL, “Music Information Retrieval”
69. November 13, 2005, University Putra Malaysia, Faculty of Computer Science and Information Technology Seminar Series, “Audio Presence: new tools for musical information retrieval and interaction”
70. November 3, 2005, University of Southern California, Integrated Media Systems Center Seminar Series, “Audio Presence: new tools for musical information retrieval and interaction”
71. August 30, 2005, Motorola Labs Center for Applications, Content and Services Research, Schaumburg, IL, “Overview of Current Research”
72. March 4, 2004 Ohio State University, Computer Science and Engineering Colloquium Series, “Name That Tune: Finding a Song from a Sung Query”
73. February 10, 2004, Johns Hopkins University, Center for Language and Speech Seminar Series, “Name That Tune: Finding a Song from a Sung Query”
74. January 29, 2004, Indiana University, School of Informatics Colloquium, “Name That Tune: Finding a Song from a Sung Query”

# EXTERNAL SERVICE

**JOURNAL EDITOR**

2019-24 Associate Editor, Transactions of the International Society of Music Information Retrieval
2017 Guest Editor, Special Issue on Music Signal Processing, IEEE Signal Processing Magazine
2009-13 Associate Editor, IEEE Transactions on Audio, Speech and Language Processing
2006 Guest Editor, Special Issue on Music and Computing, Communications of the ACM

**CONFERENCE CHAIR**

2017 General Chair, Midwest Music and Audio Day (MMAD)
2015 Technical Chair, WASSPA
2014-19 Area Chair, Music Information Retrieval, ICASSP 2014, 2015, 2016, 2017, 2018, 2019
2013,16 Area Chair, Audio and Music, ACM Multimedia Conference
2011 Demo Session Chair - ISMIR International Conference on Music Information Retrieval

**PROFESSIONAL SOCIETY**

2016-21 Vice-chair, Audio Engineering Society Technical Committee on Semantic Audio Analysis
2013-19 IEEE SPS Technical Committee on Audio and Acoustic Signal Processing

**JOURNAL REVIEWER**

2017 Journal of the Acoustic Society of America
2006-23 IEEE Transactions on Audio, Speech and Language Processing
2014 ACM Transactions on Multimedia Computing Communications and Applications
2011 IEEE Journal of Selected topics in Signal Processing
2010 Journal of New Music Research
2009 Music Perception
2008-9 Journal of Intelligent Information Systems
2008 Journal of Mathematics and Music
2007 Communications of the ACM
2006-13 EURASIP Journal on Applied Signal Processing
2005 Musicae Scientiae
2004-06 Computer Music Journal

**CONFERENCE PROGRAM COMMITTEE / REVIEWER**

2025 WASPAA
2019-24 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)
2012-14 NIME New Interfaces for Musical Expression
2011-24 ACM CHI
2011 ACM Creativity and Cognition
2008-25 ISMIR International Conference on Music Information Retrieval
2009 World Wide Web: UI and Mobility Track
2009 Mathematics and Computation in Music
2008 Joint Conference on Digital Libraries
2008 IEEE International Symposium on Circuits and Systems
2008 International Symposium on Methodologies for Intelligent Systems
2008-10 ICMC International Computer Music Conference
2006-7 ACM Multimedia Conference, Interactive Arts Program

**OTHER SERVICE**

2005-2021 Referee and panelist, National Science Foundation
2009 Referee, Austrian Academy of Sciences

**ORGANIZATIONAL LEADERSHIP**

2016-23 Vice-chair, Audio Engineering Society Technical Committee on Semantic Audio Analysis
2013-19 IEEE SPS Technical Committee on Audio and Acoustic Signal Processing

# UNIVERSITY SERVICE

2020-25 Co-director: Human-computer Interaction + Design Institute

| | |
|---|---|
| 2020-23 | Cognitive Science Program Steering Committee |
| 2021-25 | Computer Science Faculty Search Committee |
| 2019-21 | Organizer of Computer Science Guest Lecture Series |
| 2019-25 | Chair: Computer Science Diversity Committee |
| 2019-25 | Computer Science Strategic Planning Committee |
| 2016-25 | Steering Committee for the MA in Sound Arts and Industries |
| 2011-23 | Research Steering Committee for the Segal Institute of Design |
| 2017-18 | Director of Graduate Studies, Electrical Engineering & Computer Science |
| 2014-17 | Director of Graduate Studies, Computer Science |
| 2011,17 | EECS Faculty Search Committee |
| 2006-15 | EECS Undergraduate Recruiting Committee |
| 2005-15 | Cognitive Science Program Committee |
| 2004-15 | EECS Graduate Committee |
| 2011-14 | Segal Design Faculty Search Committee |
| 2006-14 | Committee, Technology and Social Behavior Ph.D. program |
| 2012-13 | Acting Division Chair, Cognitive Systems, EECS |
| 2009 | Music Technology Faculty Search Committee |
| 2008 | EECS Cognitive Systems Faculty Search Committee |
| 2004-8 | EECS Computer Science Undergraduate Curriculum Committee |
| 2005 | Northwestern Summer Research Opportunity Program |

# TEACHING

### THESIS SUPERVISOR

Hugo Flores Garcia, Computer Science (graduation August 2025). The Neural Tape Loop: Controllable and Expressive Generative Modeling for the Sound Arts.

Max Morrison, Computer Science (graduation June 2024). Interpretable Speech Representation and Editing

Ethan Manilow, Computer Science (graduation August 2022). Title: Score-Informed and Hierarchical Methods for Computational Musical Scene Analysis

Erika Rumbold, Computer Science (graduation August 2022). Title: A Critical Analysis of Objective Evaluation Metrics for Music Source Separation Quality

Fatemeh Pishdadian, Computer Science, (graduation December 2020). Title: Auditory-inspired Approaches to Audio Representation and Analysis for Machine Hearing

Bonjun Kim, Computer Science (graduation June 2020). Title: Sound Event Annotation and Detection with Less Human Effort

Prem Seetharaman, Computer Science (graduation December 2019). Title: Bootstrapping the Learning Process for Computer Audition

Mark Cartwright, Computer Science (graduation December 2016). Title: Supporting Novice Communication of Audio Concepts for Audio Production Tools

Zafar Rafii, Computer Science (graduation August 2014). Title: Source Separation by Repetition

Zhiyao Duan, Computer Science (graduation June 2013) Title: Computational Music Audio Scene Analysis

Jinyu Han, Computer Science (graduation August 2012). Title: Computational Auditory Scene Induction

### THESIS READER

Zhihan Zhou, Doctoral Dissertation, Northwestern University (Graduation June 2025)

Michael D'Arcy, Doctoral Dissertation, Northwestern University (Graduation December 2023)

Ana Elisa Mendez, Doctoral Dissertation, New York University (Graduation December 2023)

Mahdieh Nejati, Doctoral Dissertation, Northwestern University (Graduation December 2023)

Joe Blass, Doctoral Dissertation, Northwestern University (Graduation June 2023)

Carlos Pedro Vianna Lordelo, Doctoral Dissertation, Queen Mary University of London (Graduation April 2023)

Matteo Torcoli, Doctoral Dissertation, International Audio Laboratories Erlangen (Graduation January 2023)

Kezhen Chen, Doctoral Dissertation, Computer Science (Graduation June 2022)

Stylianos Mimilakis, Doctoral Dissertation, Technische Universität Ilmenau, (Graduation June 2021)

Scott Cambo, Doctoral Dissertation, Technology and Social Behavior (Graduation December 2020)

Noah Liebman, Doctoral Dissertation, Technology and Social Behavior (Graduation December 2020)

Matt McClure, Doctoral Dissertation, Computer Science (Graduation March 2019)

James Symons, Doctoral Dissertation, Music Theory (Graduation August 2017)

Pubudu Silva, Doctoral Dissertation, Electrical Engineering (Graduation August 2014)

Benjamin Duane, Doctoral Dissertation, Music Theory (Graduation June 2012)

Scott Friedman, Doctoral Dissertation, Computer Science (Graduation June 2012)

Nathan Nichols, Doctoral Dissertation, Computer Science (Graduation June 2010)

Yan Gao, Doctoral Dissertation, Computer Science. (Graduation June 2010)

Edward Scott, Masters Thesis, Electrical Engineering (Graduated December 2010)

Morteza Dehghani, Doctoral Dissertation, Computer Science (Graduation December 2009)

Kate Lockwood, Doctoral Dissertation, Computer Science (Graduation June 2009)

Jiahui Liu, Doctoral Dissertation, Computer Science (Graduation June 2009)

Chi Yin Cheung, Masters Thesis, Computer Science (Graduated December 2007)

Sanjay Sood, Doctoral Dissertation, Computer Science (Graduation June 2007)

Holger Winnemoeller, Doctoral Dissertation, Computer Science (Graduation September 2006)

Vidya Setlur, Doctoral Dissertation, Computer Science (Graduation June 2005)

**COURSES**

Winter 2024, COMP SCI 496 **Deep Generative Models**, Northwestern University, Enrollment: 17, CTEC student overall instruction rating: 5.86 out of 6

Spring 2023, COMP SCI 496 **Deep Generative Models**, Northwestern University, Enrollment: 23, CTEC student overall instruction rating: 5.8 out of 6

Fall 2022, COMP SCI 496 **Deep Generative Models**, Northwestern University, Enrollment: 22, CTEC student overall instruction rating: 5.73 out of 6

Spring 2022, COMP SCI 496 **Deep Learning**, Northwestern University, Enrollment: 54, CTEC student overall instruction rating: 5.28 out of 6

Spring 2022, RTVF 376 **Digital Music Instrument Design**, Northwestern University, Enrollment: 18, CTEC student overall instruction rating: 4 out of 6

Fall 2021, COMP SCI 349 **Machine Learning,** Northwestern University, Enrollment: 141, CTEC student overall instruction rating: 5.06 out of 6

Spring 2021, COMP SCI 496 **Deep Generative Models**, Northwestern University, Enrollment: 17, CTEC student overall instruction rating: 5.75 out of 6

Winter 2021, COMP SCI 352 **Machine Perception of Music**, Northwestern University, Enrollment: 73, Designed: yes, CTEC student overall instruction rating: 5.3 out of 6 (Taught previously: Winter 2019, Winter 2017, Winter 2014, Winter 2010, Winter 2008, Winter 2006, Winter 2005)

Fall 2020, COMP SCI 396 **Deep Learning**, Northwestern University, Enrollment: 42 Designed: yes, CTEC student overall instruction rating: 5.3

Fall 2019, COMP SCI 397 **Computational Creativity**, Northwestern University, Enrollment: 20 Designed: yes, CTEC student overall instruction rating: 6 out of 6

Spring 2019, EECS 349 **Machine Learning**, Northwestern University, Enrollment: 108 Designed: yes, CTEC student overall instruction rating: 5.1 out of 6 (Taught previously: Fall 2017, Fall 2016, 2015, Fall 2014, Fall 2013, Fall 2012, Fall 2011, Fall 2009, Fall 2007, Winter 2007)

Fall 2018, EECS 395/495 **Computational Auditory Scene Analysis,** Northwestern University, Enrollment: 13, Designed: yes, CTEC student overall instruction rating: 6 out of 6 (Taught previously: Spring 2014, Winter 2009)

Spring 2018, EECS 395/ SAI 402 **Digital Luthier**, Northwestern University, Enrollment: 18 Designed: yes, CTEC student overall instruction rating: 5.3 out of 6

Spring 2017, EECS 495 **Deep Learning**, Northwestern University, Enrollment: 11, Designed: yes, CTEC student overall instruction rating: 5.5 out of 6 (Taught previously Spring 2016)

Spring 2011, EECS 348 **Introduction to Artificial Intelligence**, Northwestern University, Enrollment: 50 Designed: yes, CTEC student overall instruction rating: 4.4 out of 6 (Taught previously: Spring 2009, Spring 2008, Spring 2007, Spring 2006, Spring 2005)

Spring 2010, EECS 395/495 **Active Learning and Crowdsourcing**, Northwestern University, Enrollment: 10, Designed: yes, CTEC student overall instruction rating: 5.2 out of 6

Winter 2004, MUS 1800 **Introduction to Music Technology**, Madonna University, Enrollment: 5, Designed: yes (Taught previously: Winter 2003)

# SELECTED MUSICAL PERFORMANCES

November 7, 2023, Confluyo Yo: El ambiente Me Sigue, ISMIR 2023, Milano, Italy

December 4, 2019, with The East Loop, Old Town School of Folk Music, Chicago, IL

June 27, 2016, with Ecos Del Pacifico, Pritzker Pavilion, Chicago, IL

September 21, 2014, with Wanees Zarour, Chicago World Music Festival, Chicago, IL

September 27, 2013, with Balkano, Old Town School of Folk Music, Chicago, IL

September 25, 2012, with Ecos del Pacifico, Chicago World Music Festival, Chicago, IL

September 22, 2012, with Balkano, Chicago World Music Festival, Chicago, IL

March 21, 2012, with Swing Hakim, broadcast/interview on 848 radio program, WBEZ, Chicago, IL

March 19, 2012, with Balkano, Gottlieb Music Festival, Berman Center, West Bloomfield, MI

November 18, 2011, with Swing Hakim, Chicago Cultural Center, Chicago, IL

April 1, 2011, with Balkano, Chicago Cultural Center, Chicago, IL

September 27, 2010, with Balkano, Chicago World Music Festival, Chicago, IL

July 3, 2009, with Mucca Pazza, Detroit Museum of Contemporary Art, Detroit, MI

June 14, 2009, with Balkano, Petty Auditorium, Skokie, IL

January 30, 2009, with Balkano, Chicago Cultural Center, Chicago, IL

October 17, 2008, with Mucca Pazza, Modern Art Museum, Fort Worth, TX

October 12, 2008, with Mucca Pazza, Rialto Theatre, Tucson, AZ

October 11, 2008, with Mucca Pazza, Tour de Fat, Tempe Town Lake, Tempe, AZ

October 3, 2008, with Mucca Pazza, Lotus World Music Festival, Bloomington, IN

June 30, 2008, with Balkano, Taste of Chicago Festival, Grant Park, Chicago, IL

January 11, 2008, with Balkano, Chicago Cultural Center, Chicago, IL

## SELECTED ART INSTALLATIONS AND EXHIBITS

December 11-13, 2023, “Salad Bowl”: NeurIPS Conference, New Orleans, LA

June 22, 2005, “Music Story,” Wired: Next Music Festival, Vic Theater, Chicago, IL

October 4-27, 2000, “Tree Tracks: Branching Beyond the Disciplinary," Media Union Theater, University of Michigan, Ann Arbor, MI

## DISCOGRAPHY

“Awayland”, with Urbana, 2014

“Swing Hakim,” with Swing Hakim, 2011

“Balkano,” with Balkano, 2009

“Presences,” with Spider Trio, 2007

“This and That,” with Gabriel Bolkosky, 2005

“The Shape of Klez to Come,” with Into the Freylakh, 2004

“Original Flavor,” with Pardonato, 2004

“Into the Freylakh,” with Into the Freylakh, 2003

## HONORS AND AWARDS

Northwestern Associated Student Government Honor Roll for Teaching Excellence, 2012

Northwestern EECS Department Teacher of the Year, 2010-2011

National Science Foundation Career Award, 2007