

Mark B. Cartwright

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Education	Ph.D. in Computer Science 2016 Interactive Audio Lab Advisor: Bryan Pardo Northwestern University, Evanston, IL
	M.A. in Music, Science, and Technology 2007 Center for Computer Research in Music and Acoustics Advisor: Julius O. Smith III Stanford University, Stanford, CA
	B.Mus. in Music Technology 2004 Certificate in Sound Design Graduated with program honors Advisor: Gary Kendall Northwestern University, Evanston, IL
Research Interests	audio, music, human computer interaction, creativity support tools, music information retrieval, machine learning, digital signal processing
Honors and Awards	Northwestern University Terminal Year Fellowship 2016 National Science Foundation Graduate Research Fellowship 2011-2015 ACM CHI Best Paper Award Honorable Mention 2015 ACM Multimedia Best Demo Award 2014 Helen and Robert Piros Fellowship 2009
Research Experience	Postdoctoral Researcher 9/16 - now New York University, New York, NY Music and Audio Research Laboratory P.I.: Juan Pablo Bello
	Research Assistant 9/09 - 8/16 Northwestern University, Evanston, IL Interactive Audio Lab Electrical Engineering and Computer Science Department P.I.: Bryan Pardo
	Research Intern 2/15 - 5/15 Adobe Research, San Francisco, CA Creative Technologies Lab

Mentors: Gautham Mysore and Matt Hoffman

	Visiting Student Researcher Queen Mary University of London, London, UK Center for Digital Music Department of Electronic Engineering Hosts: Josh Reiss and Andrew McPherson	2/13 - 11/13
	Research Assistant Northwestern University, Evanston, IL Music Technology Department P.I.: Virgil Moorefield Assisted with literature research for the book <i>Producer as Composer</i> (MIT Press)	Summer 2004
Teaching Experience	Teaching Assistant EECS-352 Machine Perception of Audio and Music Northwestern University	Winter 2016
	Teaching Assistant DSGN 395-20 Data as Art Northwestern University / School of the Art Institute of Chicago	Fall 2014
	Teaching Assistant EECS-349 Machine Learning Northwestern University	Fall 2012
	Teaching Assistant EECS-348 Introduction to Artificial Intelligence Northwestern University	Spring 2011
Professional Experience	Audio Digital Signal Processing Engineer PacketVideo, Palatine, IL	9/07 - 8/09
	Audio Post Production Engineer Big House Audio, Chicago, IL	11/05 - 5/06
Additional Education	Summer Institute for Entrepreneurship Graduate School of Business Stanford University, Stanford, CA	7/07
PhD Thesis	Cartwright, M. Supporting Novice Communication of Audio Concepts for Audio Production Tools. PhD thesis, Northwestern University, 2016.	
Journal Articles	Cartwright, M., Seals, A., Salamon, J., Williams, A., Mikloska, S., MacConnell, D., Law, E., Bello, J.P., Nov, O. Seeing Sound: Investigating the Effects of Visualizations and Complexity on Crowdsourced Audio Annotations. In <i>Proceedings of the ACM on Human-Computer Interaction</i> , vol. 1(2): <i>Computer-Supported Cooperative Work and Social Computing 2017</i> , 2017.	

Refereed
Conference
Proceedings

Cartwright, M., Bello, J.P. Increasing Drum Transcription Vocabulary Using Data Synthesis. In *Proceedings of the International Conference on Digital Audio Effects (DAFx)*, 2018.

Cartwright, M., Salamon, J., Seals, A., Nov, O., Bello, J.P. Investigating the Effect of Sound-Event Loudness on Crowdsourced Audio Annotations. In *Proceedings of the IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2018.

Cartwright, M., Pardo, B., Mysore, G. Crowdsourced Pairwise-Comparison for Source Separation Evaluation. In *Proceedings of the IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2018.

Salamon, J., MacConnell, D., Cartwright, M., Li, P., Bello, J.P. Scaper: A Library for Soundscape Synthesis and Augmentation. In *Proceedings of the IEEE Workshop on Applications of Signal Processing to Audio and Acoustics*, 2017.

Brewer, R., Cartwright, M., Karp, A., Pardo, B., Piper, A.M. An Approach to Audio-Only Editing for Visually Impaired Seniors. In *Proceedings of the ACM SIGACCESS Conference on Computers and Accessibility (ASSETS)*, 2016.

Cartwright, M., Pardo, B., Mysore, G., Hoffman, M. Fast and Easy Crowdsourced Perceptual Audio Evaluation. In *Proceedings of the IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2016.

Ford, J., Cartwright, M., Pardo, B. MixViz: A Tool to Visualize Masking in Audio Mixes. In *Proceedings of the 139th International Audio Engineering Society Convention (AES)*, 2015.

Cartwright, M., Pardo, B. VocalSketch: Vocally Imitating Audio Concepts. In *Proceedings of ACM Conference on Human Factors in Computing Systems (CHI)*, 2015. ***Best Paper Award Honorable Mention***

Cartwright, M., Pardo, B. SynthAssist: Querying an Audio Synthesizer by Vocal Imitation. In *Proceedings of New Instruments for Musical Expression (NIME)*, 2014.

Cartwright, M., Pardo, B. Translating Sound Adjectives by Collectively Teaching Abstract Representations. In *Proceedings of the Collective Intelligence Conference*, 2014.

Cartwright, M., Pardo, B., Reiss, J. Mixploration: Rethinking the Audio Mixer Interface. In *Proceedings of the International Conference on Intelligent User Interfaces (IUI)*, 2014.

Cartwright, M., Pardo, B. Social-EQ: Crowdsourcing an Equalization Descriptor Map. In *Proceedings of the International Conference on Music Information Retrieval (ISMIR)*, 2013.

Cartwright, M., Pardo, B. Building a Music Search Database Using Human Computation. In *Proceedings of the Sound and Music Computing Conference (SMC)*, 2012.

Huq, A., Cartwright, M., Pardo, B. Crowdsourcing a Real-World On-Line Query By Humming System. In *Proceedings of the Sound and Music Computing Conference (SMC)*, 2010.

Cartwright, M., Jones, M., Terasawa, H. Rage in Conjunction with the Machine. In *Proceedings of New Instruments for Musical Expression (NIME)*, 2007.

Refereed
Workshop
Proceedings

Cartwright, M., Pardo, B. The Moving Target in Creative Interactive Machine Learning. In *Proceedings of the Workshop on Human Centred Machine Learning (HCML)* at the Confer-

ence on Human Factors in Computing Systems (CHI), 2016.

Cartwright, M., Pardo, B. Novelty Measures as Cues for Temporal Salience in Audio Similarity. In *Proceedings of the Workshop on Music Information Retrieval with User-Centered and Multimodal Strategies (MIRUM)* at the ACM International Conference on Multimedia (ACM MM), 2012.

Cartwright, M., Rafii, Z., Han, J., Pardo, B. Making Searchable Melodies: Human vs. Machine. In *Proceedings of the Workshop on Human Computation (HCOMP)* at the AAAI Conference on Artificial Intelligence (AAAI), 2011.

**Refereed
Technical
Demonstration
Proceedings**

Cartwright, M., Pardo, B. SynthAssist: An Audio Synthesizer Programmed With Vocal Imitation. In *Proceedings of the ACM International Conference on Multimedia (ACM MM)*, 2014. ***Best Demo Award***

**Non-Refereed
Publications**

Cartwright, M., Pardo, B. Audio Production with Intelligent Machines. Presented at Workshop on *Collaborating with Intelligent Machines: Interfaces for Creative Sound*, ACM Conference on Human Factors in Computing Systems (CHI), 2015.

Cartwright, M., Pardo, B. Interactive Learning for Creativity Support in Music Production. Presented at Workshop on *Semi-Automated Creativity*, ACM Creativity and Cognition, 2011.

Patents

Cartwright, M., Pardo, B. "Systems, Methods, and Apparatus to Search Audio Synthesizers using Vocal Imitation," U.S. Patent 20160133240, filed October 27, 2015, and issued May 12, 2016.

Invited Talks

"Crowdsourcing Audio Annotations" May 11, 2018
Cornell Tech

"Human-Centered Audio Processing" Mar 8, 2018
University of Victoria

"A Study on Best Practices for Crowdsourced Annotation of Sound Events" Jun 23, 2017
Midwest Music and Audio Day, Northwestern University

"Towards Data-Driven Models of Rhythm" Mar 21, 2017
Workshop on Cross-Disciplinary and Multi-Cultural Perspectives on Musical Rhythm and Improvisation III, NYU Abu Dhabi

"Give me a <ka-CHUNK>': Rethinking the Interaction Paradigm of Audio Production Tools" Oct 20, 2016
New York University

"Give me a <ka-CHUNK>': Rethinking the Interaction Paradigm of Audio Production Tools" Jun 1, 2016
University of Washington

"Give me a <ka-CHUNK>': Rethinking the Interaction Paradigm of Audio Production Tools" Apr 7, 2016
University of Toronto

	“Give me a <ka-CHUNK>’: Rethinking the Interaction Paradigm of Audio Production Tools” University of Illinois at Chicago	Mar 2, 2016
	“Crowdsourced Audio Quality Evaluation” BISH Bash (Bay Innovative Signal Hackers Bash), Hosted by Gracenote	Sep 17, 2015
	“Natural Communication and Exploration in Audio Production Interfaces” KAIST (Korea Advanced Institute of Science and Technology)	Apr 24, 2015
	“Natural Communication and Exploration in Audio Production Interfaces” Birmingham City University	Aug 6, 2014
	“Natural Communication and Exploration in Audio Production Interfaces” IRCAM (Institut de Recherche et Coordination Acoustique/Musique)	Jul 4, 2014
	“SynthAssist: Querying a Synthesizer Using Vocal Imitation” Midwest Music Information Retrieval Gathering, Northwestern University	Jun 14, 2014
	“Building a Personalized Audio Equalizer Interface” Telecom ParisTech	Jun 13, 2013
External Service	Journal Reviewer IEEE Signal Processing Magazine	2018
	Journal Reviewer IEEE Transactions on Multimedia	2018
	Conference Reviewer ACM Conference on Computer-Supported Cooperative Work and Social Computing	2018
	Program Committee International Conference on Digital Audio Effects	2018
	Program Committee ACM IUI Workshop on Intelligent Music Interfaces for Listening and Creation	2018
	Conference Reviewer IEEE International Conference on Acoustics, Speech, and Signal Processing	2014-18
	Conference Reviewer International Society for Music Information Retrieval Conference	2009-10, 2012-18
	Journal Reviewer ACM Transactions on Interactive Intelligent Systems	2017
	Journal Reviewer Journal on Multimodal User Interfaces	2016
	Conference Reviewer ACM Multimedia	2013-16
	Conference Reviewer ACM SIGCHI Conference on Human Factors in Computing Systems	2014, 2016

	Conference Reviewer	2016
	ACM International conference on Tangible, Embedded and Embodied Interaction (TEI)	
	Journal Reviewer	2015
	IEEE Signal Processing Letters	
	Conference Reviewer	2015
	IEEE Workshop on Applications of Signal Processing to Audio and Acoustics	
	Journal Reviewer	2010-12, 2014
	IEEE Transactions on Audio, Speech and Language Processing	
	Conference Reviewer	2012
	International Computer Music Conference	
	Journal Reviewer	2011
	Information Retrieval	
	Conference Reviewer	2011
	International Conference on Human-Computer Interaction with Mobile Devices and Services	
	Conference Reviewer	2010
	IEEE International Workshop on Multimedia Signal Processing	
Discography	“Piñata” with <i>volcano!</i> , The Leaf Label	2012
	“Piñata (single)” with <i>volcano!</i> , The Leaf Label	2012
	“So Many Lemons (single)” with <i>volcano!</i> , The Leaf Label	2009
	“Paperwork” with <i>volcano!</i> , The Leaf Label	2008
	• New York Times “Critic’s Choice”	9/2008
	“Africa Just Wants To Have Fun (7-inch)” with <i>volcano!</i> , The Leaf Label	2008
	“Apple or a Gun (7-inch)” with <i>volcano!</i> , The Leaf Label	2006
	“Beautiful Seizure” with <i>volcano!</i> , The Leaf Label	2005
	• DrownedInSound.com’s #2 Album of the Year	2006
	“Chicago Union Station” with <i>Cartwright, Moorefield, Weeter</i>	
	• Organised Sound DVD, Cambridge University Press	2004
	• International Computer Music Conference DVD	2004
Conference/ Festival Presentations of Compositions	“Six Corners” by <i>Cartwright, Moorefield, Weeter</i>	
	• Third Practice	2006
	• New Music Northwestern Festival	2005
	“Chicago Union Station” by <i>Cartwright, Moorefield, Weeter</i>	
	• Electronic Music Midwest	2005
	• Society for Electro-Acoustic Music in the United States	2005

- International Computer Music Conference

2004

Selected Musical Performances	<i>volcano!</i> at Daytrotter.com, Rock Island, IL	12/7/12
	<i>volcano!</i> at WBEZ's 848, Chicago, IL	6/12/12
	<i>volcano!</i> at Millenium Park, Chicago, IL	5/31/10
	<i>volcano!</i> at Tabula Rasa, Moscow, Russia	4/29/09
	<i>volcano!</i> at SWN Festival, Cardiff, UK	11/24/08
	<i>volcano!</i> at Botanique, Brussels, Belgium	11/05/08
	<i>volcano!</i> at Interzona, Verona, Italy	10/25/08
	<i>volcano!</i> at Radio RAI (Italian National Radio), Bolzano, Italy	10/23/08
	<i>volcano!</i> at Lido, Berlin, Germany	10/21/08
	<i>volcano!</i> at Harbourfront Centre, Toronto, Canada	8/25/06
	<i>volcano!</i> at Villette Sonique Festival, Paris, France	6/24/06
	<i>volcano!</i> at Huw Stephens Session (BBC Radio 1), London, UK	6/27/06
	<i>volcano!</i> at SXSW, Austin, TX	3/17/06
	<i>Cartwright, Moorefield, Weeter</i> at New Music Northwestern, Evanston, IL	5/22/05

Programming and Software Skills	• Python (+SciPy stack), Matlab, C, C++, JavaScript, Stan, SQL, R, Lisp, Java
	• Max/MSP, SuperCollider
	• Various music and audio production tools (e.g. Pro Tools, Logic, Live)

Professional Memberships	ACM (Association for Computing Machinery)
	IEEE (Institute of Electrical and Electronics Engineers)
	AES (Audio Engineering Society)

References	Juan P. Bello, Associate Professor at New York University jpbello@nyu.edu
	Bryan Pardo, Associate Professor at Northwestern University pardo@northwestern.edu
	Gautham Mysore, Senior Research Scientist at Adobe Research gmysore@adobe.com
	Darren Gergle, Associate Professor at Northwestern University dgergle@northwestern.edu
	Oded Nov, Associate Professor at New York University onov@nyu.edu
	Josh Reiss, Senior Lecturer at Queen Mary University of London josh.reiss@eecs.qmul.ac.uk