

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, multimedia 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
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.
Research Experience	Post-Doctoral 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 2/13 - 11/13
Queen Mary University of London, London, UK
Center for Digital Music
Department of Electronic Engineering
Hosts: Josh Reiss and Andrew McPherson

Research Assistant Summer 2004
Northwestern University, Evanston, IL
Music Technology Department
P.I.: Virgil Moorefield
Assisted with literature research for the book *Producer as Composer* (MIT Press)

Teaching Experience **Teaching Assistant** Winter 2016
EECS-352 Machine Perception of Audio and Music
Northwestern University

Teaching Assistant Fall 2014
DSGN 395-20 Data as Art
Northwestern University / School of the Art Institute of Chicago

Teaching Assistant Fall 2012
EECS-349 Machine Learning
Northwestern University

Teaching Assistant Spring 2011
EECS-348 Introduction to Artificial Intelligence
Northwestern University

Professional Experience **Audio Digital Signal Processing Engineer** 9/07 - 8/09
PacketVideo, Palatine, IL

Audio Post Production Engineer 11/05 - 5/06
Big House Audio, Chicago, IL

Additional Education **Summer Institute for Entrepreneurship** 7/07
Graduate School of Business
Stanford University, Stanford, CA

PhD Thesis Cartwright, M. Supporting Novice Communication of Audio Concepts for Audio Production Tools. PhD thesis, Northwestern University, 2016.

Refereed Conference Proceedings 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 Appli-*

cations 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 Conference 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 Im-

itation. 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.

Invited Talks

“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” Mar 2, 2016
University of Illinois at Chicago

“Crowdsourced Audio Quality Evaluation” Sep 17, 2015
BISH Bash (Bay Innovative Signal Hackers Bash), Hosted by Gracenote

“Natural Communication and Exploration in Audio Production Interfaces” Apr 24, 2015
KAIST (Korea Advanced Institute of Science and Technology)

“Natural Communication and Exploration in Audio Production Interfaces” Aug 6, 2014
Birmingham City University

“Natural Communication and Exploration in Audio Production Interfaces” Jul 4, 2014
IRCAM (Institut de Recherche et Coordination Acoustique/Musique)

“SynthAssist: Querying a Synthesizer Using Vocal Imitation” Jun 14, 2014
Midwest Music Information Retrieval Gathering, Northwestern University

“Building a Personalized Audio Equalizer Interface” Jun 13, 2013
Telecom ParisTech

External Service	Conference Reviewer	2009-10, 2012-17
	International Society for Music Information Retrieval Conference	
	Journal Reviewer	2017
	ACM Transactions on Interactive Intelligent Systems	
	Conference Reviewer	2014-17
	IEEE International Conference on Acoustics, Speech, and Signal Processing	
	Journal Reviewer	2016
	Journal on Multimodal User Interfaces	
	Conference Reviewer	2013-16
	ACM Multimedia	
	Conference Reviewer	2014, 2016
	ACM SIGCHI Conference on Human Factors in Computing Systems	
	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
	<ul style="list-style-type: none"> • 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

Josh Reiss, Senior Lecturer at Queen Mary University of London
josh.reiss@eecs.qmul.ac.uk