

# MARY B. PIETROWICZ

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Postdoctoral Researcher  
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IBM Thomas J Watson  
Research Center  
1101 Kitchawan Rd.  
Yorktown Heights, NY 10598

## EDUCATION

### University of Illinois at Urbana-Champaign

*Advisors:* Mark Hasegawa-Johnson and Karrie Karahalios

*Committee Members:* Jennifer Cole, Julia Hockenmaier,  
Jerome McDonnough, and Gina-Anne Levow

*Studied Music Composition with:* Philipp Blume, Guy Garnett,  
Heinrich Taube, Stephen Taylor, and Reynold Tharp.

### Ph.D. Computer Science

12/2017

### Florida Atlantic University

Degree completed while working full time in industry.

### Master of Computer Science

1994

### Purdue University

### B.S. Electrical Engineering

1986

## TEACHING EXPERIENCE

### Interactive Computer Graphics: 2015, 2016, & 2017, Teaching Assistant

Taught computer graphics programming sections two hours per week to grad students and advanced undergrads. Developed course content. Graded student projects and exams, and advised students on their class projects.

### Multimedia Signal Processing: 2016, Teaching Assistant

Taught lectures pertaining to programming projects to grad students and advanced undergrads. Graded homework, and advised students.

### User Interfaces: 2014, Teaching Assistant

Developed course content, graded student projects and exams, and advised students at all levels in office hours.

*Student quote: "I really enjoyed your teaching since it is very clear and helpful."*

## INDUSTRY EXPERIENCE

### IBM Thomas J Watson Research Center

Postdoctoral researcher studying expressive speech.

2017-current

### W.W. Grainger, Inc.

Intellectual Property researcher and software development engineer (intern).

2015-2016

Mary Pietrowicz, Ph.D. Candidate, University of Illinois at Urbana-Champaign.

<b>National Center for Supercomputing Applications (NCSA), &amp; Institute for Advanced Computing Applications and Technologies (IACAT)</b> Research programmer, developer, and performer for virtual worlds projects, interactive art performances, and cyber-infrastructure development.	2006-2011
<b>Informatics Research Institute at IUPUI</b> Consultant and engineer.	2006
<b>Pervasive Technology Labs at Indiana University</b> Senior engineer specializing in location tracking, RFID, and tangible user interface applications.	2002-2005
<b>University of Illinois, Department of Computer Science</b> Research programmer for explorations in smart environments.	2001-2002
<b>Personal Genie</b> Senior engineer specializing in smart device control.	2000-2001
<b>dChain Commerce</b> Chief research and development engineer for electronic trading hub projects.	1999-2000
<b>National Center for Supercomputing Applications</b> Research programmer specializing in scientific workbenches, synchronous and asynchronous collaborative systems, early web portals, and notification systems.	1995-1999
<b>Motorola, Inc.</b> Computer-aided software engineering (CASE) engineer.	1993-1995
<b>Ungermann-Bass</b> Software engineer for network management projects.	1991-1993
<b>Motorola, Inc.</b> Software engineer for embedded radio software and radio service software.	1986-1991

## LEADERSHIP & SERVICE

**Undergraduate Mentoring Program at the University of Illinois:** research supervisor and mentor 2016-2017.  
**Journal of the Acoustical Society of America (JASA):** reviewer 2015, 2016, 2017.  
**iConference:** reviewer 2015.  
**Creativity & Cognition:** Graduate Student Symposium Committee, 2015.  
**CHI:** WIP Program Committee, 2014.  
**ASSETS:** Mentor, 2014 (resulted in successful publication for 1<sup>st</sup>-time authors).

## AWARDS

Qualcomm Innovation Fellowship Finalist 2014-2015

University of Illinois Department of Music, Composition Division Award, 2007

## PROJECT HIGHLIGHTS

### **Perception-grounded Analytics for Vocal Expression** 2013-2017

*UIUC: Departments of Computer Science and Electrical and Computer Engineering*

Developed software and transformative research methods for exploring machine perception of human vocal expression. The results provided new insight into what people hear in expressive voices and how these perceived elements function. Methods applied here are recommended for all researchers interested in 1) investigating *any* human expressive-interactive modality (not just speech), and 2) producing application software which supports natural, human perception-aligned interaction. ***See publications list below for project papers.***

### **CrowdBand** 2013

*UIUC: Department of Computer Science*

Developed software for automated, crowdsourced sound composition. This project demonstrated the potential of using crowdsourced systems for the creation of complex, creative works. ***See publications list below for project paper.***

### **Astral Convertible** 2010-2011

*National Center for Supercomputing Applications (NCSA)*

Developed interactive gesture-tracking software for remade version of original groundbreaking Trisha Brown/John Cage piece, which was performed at the Krannert Center for the Performing Arts. ***See the press release: <https://news.illinois.edu/blog/view/6367/205733>.***

### **Kinetic Flame** 2011

*UIUC: Departments of Music and Dance*

Interactive piece for dancer, percussion, motion sensors, electronics, lighting, and video, performed at the Krannert Art Museum, University of Illinois. I composed the piece, rendered the sound electronically, developed gesture tracking software, and used the dancer's gestures to modulate the sound, visuals, and lighting in real time. Incorporated the stage set for Astral Convertible into the piece. ***See a recording at: <https://vimeo.com/23083695>***

### **Location-aware Museum Guide: ArtXplore** 2004-2005

*Pervasive Technology Labs (PTL) at Indiana University*

Developed wifi-based, location-tracking software for a handheld museum guide, which was demonstrated at the Indianapolis Museum of Art (IMA) during its 2005 re-opening. This project was influential in the future technology directions at the IMA, and indirectly, at other museums. ***See the press release: <http://newsinfo.iu.edu/news-archive/2129.html>***

Mary Pietrowicz, Ph.D. Candidate, University of Illinois at Urbana-Champaign.

### **Make-a-Meal System for Health Education**

2003-2004

*Pervasive Technology Labs (PTL) at Indiana University*

Developed an engaging, child-appropriate, RFID-instrumented physical object interface for **teaching nutrition (part of the required curriculum) to thousands of Indiana school children** at the Ruth Lilly Health Education Center in Indianapolis, IN. The interface allowed a class to build meals by placing instrumented food models on a cafeteria tray for nutrient analysis. The system automatically detected the selected foods, analyzed the nutrient content, and displayed the results.

### **NCSA Joule & NCSA Habanero**

1995-1998

*National Center for Supercomputing Applications (NCSA)*

Developed early internet tools for synchronous and asynchronous collaboration. Joule, the asynchronous collaboration system, was an early interactive web portal package created before the term “web portal” had been coined, and before web infrastructure was generally available (created with pre-serialization versions of Java). Also wrote the subscription-based notification system for Joule (also in pre-serialization Java). Developed an object database interface for Habanero (the primarily synchronous platform), and extended its infrastructure to support a blended synchronous-asynchronous collaboration infrastructure for the collaboration platform.

***See the Wall Street Journal Article for NCSA Habanero:***

***<http://www.wsj.com/articles/SB833398067192005000>***

### **Radio Service Software Toolkits**

1986-1988

*Motorola, Inc.*

Developed field service software packages for the electronic tuning/programming of police radios. Also managed a range of software contracts and contractors in this application domain.

***Motorola service shop engineers and field technicians worldwide used this software.***

## **PUBLICATIONS**

### **CONFERENCE PAPERS & POSTERS (PEER-REVIEWED)**

- [1] **Mary Pietrowicz**, Mark Hasegawa-Johnson, and Karrie Karahalios. “Discovering Dimensions of Perceived Vocal Expression in Semi-structured, Unscripted Oral History Accounts,” International Conference on Acoustics, Speech, and Signal Processing (ICASSP) 2017.
- [2] **Mary Pietrowicz**, Mark Hasegawa-Johnson, and Karrie Karahalios. “Acoustic Correlates for Perceived Effort Levels in Expressive Speech,” INTERSPEECH 2015 (poster presentation).
- [3] **Mary Pietrowicz** and Karrie Karahalios. “Visualizing Vocal Expression,” CHIEA 2014 (poster presentation).
- [4] **Mary Pietrowicz** and Karrie Karahalios, “Sonic Shapes: Visualizing Vocal Expression,” International Community for Auditory Display (ICAD) 2013.

Mary Pietrowicz, Ph.D. Candidate, University of Illinois at Urbana-Champaign.

[5] **Mary Pietrowicz**, Danish Chopra, Amin Sadeghi, Puneet Chandra, Brian Bailey, and Karrie Karahalios. "CrowdBand: An Automated Crowdsourcing Sound Composition System," Human Computation and Crowdsourcing (HCOMP) 2013.

[6] **Mary Pietrowicz** and Karrie Karahalios. "Phonetic Shapes: An Interactive, Sonic Guest Book," CHIEA 2012 (poster presentation).

[7] Guy Garnett, Robert E. McGrath, and **Mary Pietrowicz**. "mWorlds: novel human interaction with virtual worlds," Mardi Gras 2009: Virtual Worlds: New Realms for Culture, Creativity, Commerce, Computation, and Communication, 2009.

## JOURNAL ARTICLES

[8] **Mary Pietrowicz**, Mark Hasegawa-Johnson, and Karrie Karahalios. "Acoustic correlates for perceived effort levels in male and female acted voices," Journal of the Acoustical Society of America, 2017.

## BOOK CHAPTERS

[9] "Special Edition, Using Java," First Edition, Que Publishing, 1996.

## WORKSHOP PAPERS (PEER-REVIEWED)

[10] **Mary Pietrowicz** and Karrie Karahalios. "Paralingual Analysis, Voice Visualization, and Mobile Devices as Enabling Technologies," HCIC 2014.

[11] Jennifer Kim, Melinda Snodgrass, **Mary Pietrowicz**, Karrie Karahalios, and Jim Halle. "Visual Analytics for Behavioral and Physiological Data," VAHC 2013.

[12] **Mary Pietrowicz**, Robert E. McGrath, Guy Garnett, and John Toenjes. "Multimedia Gestural Interaction in Performance," Whole Body Interfaces Workshop, CHI 2010.

[13] Robert E. McGrath, **Mary Pietrowicz**, Ben Smith, and Guy Garnett, "Transforming Human Interaction with Virtual Worlds," Workshop on Computational Creativity Support, CHI 2009.

## PRESENTATIONS

[14] **Mary Pietrowicz**, Mark Hasegawa-Johnson, and Karrie Karahalios, "Discovering Dimensions of Perceived Vocal Expression in Semi-Structured, Unscripted Oral History Accounts," Midwest Speech and Language Days (MSLD) 2017 (presentation).

[15] **Mary Pietrowicz**, Mark Hasegawa-Johnson, and Karrie Karahalios, "Acoustic Correlates for Perceived Effort Levels in Male Scripted Speech," Midwest Speech and Language Days

Mary Pietrowicz, Ph.D. Candidate, University of Illinois at Urbana-Champaign.

& Midwest Computational Linguistics Colloquium (MSLD & MCLC) 2016 (presentation).

- [16] **Mary Pietrowicz**, Mark Hasegawa-Johnson, and Karrie Karahalios, “Acoustic Correlates for Perceived Effort Levels in Expressive Speech,” Midwest Speech and Language Days (MSLD) 2015 (poster).
- [17] **Mary Pietrowicz** and Karrie Karahalios. “Visualizing Vocal Expression,” for NSF Expeditions project: “Collaborative Research: Computational Behavioral Science: Modeling, Analysis, and Visualization of Social and Communicative Behavior,” 2013 (presentation).
- [18] John Toenjes, Thecla Schiphorst, and **Mary Pietrowicz**, Interactive Workshop on Laban Movement, 2009 (accelerometer-based, interactive motion analysis demonstration and presentation).
- [19] **Mary Pietrowicz** and Polly Baker, “Location Aware Multimedia Delivery in an Art Museum,” I-Light Symposium Presentation, Indianapolis, IN, 2005 (presentation).
- [20] Robert Comer, Verlyn Wilson, and **Mary Pietrowicz**, “Make-A-Meal Interface for Nutrition Education,” National Association of Health Education Centers, Philadelphia, PA, 2003 (demonstration and presentation).

## INTERACTIVE ART PERFORMANCES

- [21] **Air Tropes** Sept, 2014  
A sonification of soybean growth data, which emphasized differences between CO<sub>2</sub>-enhanced and Ozone-enhanced environments for plant growth. Part of the “Sounds of Science” collaboration between artists and scientists at the University of Illinois, at the Krannert Art Museum, University of Illinois.
- [22] **Kinetic Flame** April 2011  
Interactive piece for dancer, percussion, motion sensors, electronics, and video, at the Krannert Art Museum, University of Illinois.  
Available at: <https://vimeo.com/23083695>
- [23] **Dark Star** April 2011  
Interactive piece for dancer, percussion, motion sensors, electronics, and electronic lighting, at the Krannert Art Museum, University of Illinois.  
Available at: <https://vimeo.com/63711846>
- [24] **Remembering** October 2010  
Composed piece for 4 voices and chamber orchestra, based on WWII oral history texts, at Smith Hall, University of Illinois.
- [25] **Voltage** July 2010  
Composed piece for flute, piano, and electronics, at Smith Hall, University of Illinois.

Mary Pietrowicz, Ph.D. Candidate, University of Illinois at Urbana-Champaign.

[26] **Astral Convertible** (motion tracking software component) February 2009  
Developed gesture-tracking, interactive software for remade version of original Trisha Brown/John Cage piece, at the Krannert Center for the Performing Arts.

[27] **Edream and Be Merry** April 2009  
Interactive, improvised, distributed performance for violin, flute, percussion, and distributed virtual worlds display. Developed portions of the interactive software, and performed the flute part. At the HASTAC Blue Lights in the Basement event, Krannert Center for the Performing Arts.