Madeline Huberth

Center for Computer Research in Music and Acoustics (CCRMA)
mhuberth@ccrma.stanford.edu
http://ccrma.stanford.edu/~mhuberth/

EDUCATION

Ph.D.	Computer-Based Music Theory and Acoustics Stanford University, Department of Music Dissertation: "Perceiving and Performing Multiplicity in Concurrent and Implied Polyphony" Advisor: Dr. Takako Fujioka	Spring 2018, expected
M. Phil.	Music Studies University of Cambridge, Music Faculty Darwin College Advisors: Dr. Ian Cross, Dr. Sarah Hawkins	2013
B.S., B.S.	Interdisciplinary Physics, Cello Performance University of Michigan College of Literature, Science, and the Arts; School of Music, Theatre, and Dance Advisors: Dr. Timothy McKay, physics; Mr. Richard Aaron, cello	2011

RESEARCH EXPERIENCE

Neuromusic lab, Stanford University 2013 - present

Under the direction of Dr. Takako Fujioka, I carry out music psychology and neuroscience experiments at the NeuroMusic lab at CCRMA, using electroencephalography (EEG), motion capture, and behavioral methods. I have been involved in all stages of the experimental process, including the design, stimulus creation, data collection, analysis, and writing. My work centers on the behavioral and neural correlates of listening to and playing polyphonic music, relating to areas of action-monitoring, object perception, and performer interpretation. Most recently we are carrying out a dual-EEG (hyperscanning) study using a piano duet joint-action task to observe the effects of social interaction and similarity of musical motifs on self-other action monitoring.

Centre for Music and Science, University of Cambridge 2012 - 2013

I conducted a research study on how the emotions we feel the first time we hear a piece of music affects subsequent recognition of that music. Using behavioral and physiological data (galvanic skin response), my advisors, Dr. Ian Cross and Dr. Sarah Hawkins, and I found that felt arousal in response to musical stimuli, in accordance with the greater literature on emotion and memory, predicts subsequent musical recognition.

Department of Physics, University of Michigan 2009 - 2011

Advised by Dr. Timothy MåcKay, I conducted a behavioral experiment on the effects of the removal of auditory feedback on timbre in cellists.

PUBLICATIONS

Journal Articles

Huberth, M. and Fujioka, T. (in press). Performers' motions reflect the intention to express short or long melodic groupings. *Music Perception.*

Huberth, M. and Fujioka, T. (2017). Neural correlates of a melodic motif: Effects of polyphonic contexts. *Brain and Cognition*, *111*, 144-155.

Huberth, M., Chen, P., Tritz, J., McKay, T.A. (2015). Computer-Tailored Student Support in Introductory Physics. *PLoS ONE 10*(9): e0137001. doi:10.1371/journal.pone.0137001

Conference Proceedings

Wu, C., **Huberth, M.**, Yeh, Y., Wright, M. "Evaluating the Audience's Perception of Real-time Gestural Control and Mapping Mechanisms in Electroacoustic Vocal Performance." *Proceedings of the 16th International Conference on New Interfaces for Musical Expression*, *2016.*

Huberth, M., Nanou, C. "Notation for 3D Motion Tracking Controllers: A Gametrak Case Study." *Proceedings of the 16th International Conference on New Interfaces for Musical Expression*, *2016.*

Huberth, M., Wang, G. "Effects of Descriptive Imagery on Emotional Responses to Electroacoustic Music." *Proceedings of the International Conference on the Multimodal Experiences of Music, 2015.*

Masters Thesis

Huberth, M. 2014. *The Influence of Arousal on Musical Memory.* Masters Thesis, University of Cambridge.

Other Publications

Huberth, M., Micholetti, N., McKay, T. "E2Coach: Tailoring Support for Students in Introductory STEM Courses." *EDUCAUSE Review Online.*

Huberth, M. "E2Coach: Customized Support for Learning Success." *Next Generation Learning Challenge Blog*.

TEACHING EXPERIENCE

Teaching Affiliate – Stanford University - Winter 2017
Department of Music
Psychophysics and Music Cognition

Teaching Assistant – Stanford University – Fall 2014 – present
Department of Music
Fundamentals of Computer-Generated Sound (Fall 2014, 2015).
Ear Training (Winter 2015, Spring 2017)
Psychophysics and Music Cognition (Spring 2016)
Departments of Music and Computer Science
Stanford Laptop Orchestra: Composition, Coding, and Performance (Spring 2015)

Instructor – Stanford Pre-Collegiate Summer Institute – Summer 2014, 2015

Stanford Youth Orchestra

Music Cognition. Designed core curriculum for 3-week course, delivered biweekly lectures, assigned and graded homework for high school students.

FELLOWSHIPS, AWARDS, and GRANTS

Stanford Interdisciplinary Graduate Fellowship (SIGF), *Geballe Graduate Fellow,* 2015-2018

Three-year fellowship awarded to outstanding doctoral students engaged in interdisciplinary research. Two-years of tuition plus one year of TGR tuition as well as a yearly stipend.

SCORE: Strengthening the Core Grant ($5000), Spring/Summer 2015

Funding for homework assignment and course structure redesign for Music 220A: Fundamentals of Computer Generated Sound, granted to Dr. Chris Chafe and myself. Wrote ChucK tutorials

SPICE: MASALA 2015 ($3500), 2016 ($4000), 2017 ($4000)

Led two applications for a SPICE grant to put towards CCRMA colloquiua, student journal clubs. The 2016 application involved equal student participation from CCRMA and musicology PhDs, forming a cooperative journal club targeting both audiences.

Music & Letters Award, 2014 ($500)

Awarded by the Music & Letters journal to support music research and conference attendance.

Gates Cambridge Scholar, 2012-2013 (~$20,000)

Full funding for study at the University of Cambridge. Awarded to those with a capacity for leadership and a commitment to improving the lives of others. ~40 United States citizens selected per year.

George Eugene Uhlenbeck Award, 2012

Recognizing outstanding achievements by an undergraduate student in physics at the University of Michigan.

Telluride Association Merit Scholarship, 2010-2012

Full room and board scholarship for University of Michigan. Self-governed academic community founded on democratic organization, community service, and intellectual inquiry.

Jack Meiland Scholarship, 2009

Awarded to an outstanding University of Michigan Honors College Student.

INVITED TALKS

September 2015. *'Bring out the voices': exploring the relationship between performers' gestures and implied polyphony.* PAT 521: Advanced Psychoacoustics. Presentation at the University of Michigan, Ann Arbor, MI.

February, 2015. *Making Music Socially*: *A Story of People and Technology in the 21st Century.* Mathematical Sciences Research Institute. Presentation with Prof. Ge Wang at Berkeley City College. Berkeley, CA.

CONFERENCE PRESENTATIONS

Huberth, M. "Melodic grouping interpretation is reflected in performers' motions: An empirical study of cellists." *The College Music Society 2017 National Conference*, San Antonio, TX, October 26-28, 2017.

Huberth, M., Dauer, T., Roman, I., Nanou, C., Reid, W., Gang, N., Wright, M., and Fujioka, T. "Involvement or irrelevance: Representation of the self vs. other in joint piano performance recorded by dual-EEG." *24th Meeting of the Cognitive Neuroscience Society*, San Francisco, CA, March 2017. Poster presentation.

Roman, I., Dauer, T., **Huberth, M.**, Nanou, C., Reid, W., Gang, N., Wright, M., and Fujioka, T. "A dual EEG study during piano performance: the effect of the partner's animacy and melodic content on alpha-band oscillations." *24th Meeting of the Cognitive Neuroscience Society*, San Francisco, CA, March 2017. Poster presentation.

Wu, C., **Huberth, M.,** Yeh, Y., & Wright, M. "Evaluating the Audience's Perception of Real-time Gestural Control and Mapping Mechanisms in Electroacoustic Vocal Performance." *The 16th International Conference on New Interfaces for Musical Expression*, Brisbane, Australia, July 2016. Oral presentation.

Huberth, M. & Nanou, C. "Notation for 3D Motion Tracking Controllers: A Gametrak Case Study." *The 16th International Conference on New Interfaces for Musical Expression*, Brisbane, Australia, July 2016. Poster presentation.

Huberth, M. & Fujioka, T. "Performers' motions reflect their intention to express local or global structure in melody." *The 14th International Conference on Music Perception and Cognition*, San Francisco, CA, July 2016. Poster presentation.

Huberth, M. & Fujioka, T. "Melodic motif identity modulates encoding of alternating polyphonic voices." *The 14th International Conference on Music Perception and Cognition*, San Francisco, CA, July 2016. Poster presentation.

Huberth, M. & Fujioka, T. "Neural processing of multiple melodic voices: The role of motif identity." *23rd Meeting of the Cognitive Neuroscience Society*, New York, NY, March 2016. Poster presentation.

Huberth, M. "Accommodating All in Computer Music: Challenges and Rewards in the Increasing Popularity of Digital Audio Fundamentals." *2016 College Music Society (CMS) Pacific Southwest Regional Conference*, Long Beach, CA, March 2016. Poster presentation.

Huberth, M. "Applying a computer vision object tracking algorithm to detect musicians' ancillary gestures." *Stanford Center for Image Systems Engineering (SCIEN) Industry Affiliates Meeting*, Stanford, CA, December 2015. Poster presentation.

Huberth, M. & Fujioka, T. "Do performers' gestures express implied polyphony in the solo string works of J.S. Bach? An exploratory study." *Meeting of the Society for Music Perception and Cognition*, Nashville, TN, August 2015. Poster presentation.

Huberth, M. & Fujioka, T. "Encoding of staggered polyphonic musical motives: The effects of time-offset between motif entries on mismatch negativity (MMN)." *22nd Meeting of the Cognitive Neuroscience Society*, San Francisco, CA, March 2015. Poster presentation.

Huberth, M. & Fujioka, T. "Encoding of staggered polyphonic musical motives: The effects of time-offset between motif entries on mismatch negativity (MMN)." *13th Annual Auditory Perception, Cognition, and Action Meeting*, Long Beach, CA, November 2014. Spoken presentation.

Huberth, M., Hawkins, S., & Cross, I. "The Influence of Arousal on Musical Memory." *The 13th International Conference on Music Perception and Cognition and the 5th Conference for the Asian-Pacific Society for Cognitive Sciences of Music,* Seoul, Korea, August 2014. Poster presentation.

Huberth, M. & Fujioka, T. "Encoding of staggered polyphonic musical motives: The effects of time-offset between motif entries on mismatch negativity (MMN)." *Conference Neuroscience and Music-V*, Dijon, France, May 2014. Poster presentation.

Tritz, J., **Huberth, M.**, Chen, P., McKay, T. "E2Coach – Coaching Students with Computer Tailored Communication." *Learning Analytics and Knowledge*, Leuven, Belgium. April 2013. Poster presentation.

Huberth, M. & McKay, T. "Effects of Auditory Feedback on Instrumentalists' Timbre Production." *AIA-DAGA Conference on Acoustics*, Merano, Italy. March 2013. Poster presentation.

Huberth, M. & McKay, T. "Effects of Auditory Feedback on Instrumentalists' Timbre Production." *162nd Meeting of the Acoustical Society of America*, San Diego. November, 2011. Poster presentation.

PROFESSIONAL SERVICE

Research Committee Member of Stanford University Office of the President's Long-Term Planning Process. April 2017 – September 2017. One of two graduate students to sit on a faculty-led steering committee, responsible for reading and curating proposals submitted by current Stanford University members on Stanford's long-range vision. Selection by nomination.

Session Chair Organizer, 14th International Conference on Music Perception and Cognition, July 5th-July 9th, 2016, San Francisco, CA.

CCRMA Colloquium Curator (with Romain Michon). 2014 – 2016. Led a restructure of the CCRMA colloquium to allow for more student and faculty presentations, both in conference (20 minute) and 'rapid-fire' (5 minutes) formats. Handled scheduling and speaker introductions, coordinating a team of ~4-5 PhD students.

M.Phil Student Representative to the Music Faculty, University of Cambridge. 2012-2013.

Webmaster, Cambridge University Opera Society. 2012-2013.

PROFESSIONAL AFFILIATIONS & MEMBERSHIPS

Member, Society for Music Perception and Cognition. 2013 – present.
Member, International Computer Music Association. 2015 – present.
The College Music Society. 2015- present.
American Musicological Society. 2015 – present.

COMMUNITY OUTREACH

February 2015. California Academy of Sciences – NoisePop Nightlife. *Understanding auditory grouping processing using EEG.* San Francisco, CA.

November 2014. Los Altos High School STEM Week. *Sound, Music, Emotion: Stories of How and Why Music Moves Us.* Los Altos, CA.

May 2012. TEDxUofM. *The Cello and the Group.* Ann Arbor, MI.

NON-ACADEMIC WORK

2012 – 2013. Application Programmer and Associate Analyst. E^2Coach Project, University of Michigan Physics Department. Wrote and tailored study advice for an online coaching platform for introductory physics courses. Performed data analysis on their performance, responsible for website redesign.

2009 - 2012. Assistant Principal Cello. Lansing Symphony Orchestra. Performed monthly classical music concerts for up to 2500 patrons. Served on audition committees, advising the contracting of new musicians.

2010 - 2012. Marking Director, Board of Directors. Ann Arbor Camerata. Promoted the organization through branding techniques and development of mission statement.

SELECTED MUSICAL COMPOSITIONS

"Beijing" (2014, with Ge Wang) for laptop orchestra. Stanford Laptop Orchestra Live in Beijing Concert at the Stanford Center @Peking University in July 2014. Sounds recorded on location in Beijing; live processing via gestures using GameTrak controllers.

"Continuum" (2014, with Ge Wang) for laptop duet and live visuals.

"SEM Sounds" (2014) for solo laptop performer, also arranged for laptop duet (2015).

SELECTED CELLO PERFORMANCES & FESTIVALS

April 2012. Masterclass with Lynn Harrell. Piatigorsky International Cello Festival.

February 2012. Requiem by David Popper. Performance with the Albany Symphony Orchestra for "Cellobration" concerts, David Allen Miller, conductor.
Summer 2011, 2009. Music Academy of the West: Academy Festival Orchestra. Leonard Slatkin, Nicholas McGegan, Peter Oundjian, and Larry Rachleff, conductors.
March 2011. YouTube Symphony Orchestra, Sydney, Australia. Michael Tilson Thomas, conductor.
Summer 2008. Summer Music Institute, Kennedy Center, Washington D.C.
Spring 2007. Hudson Valley Philharmonic Young Performer's Competition. Winner. 5-concert tour of the Boellmann Symphonic Variations with the Hudson Valley Philharmonic.

ADDITIONAL INFORMATION

Spoken languages: English (native). German (beg.)
Citizenship: U.S.A.

REFERENCES

Takako Fujioka, Ph.D.
Assistant Professor
CCRMA (Center for Computer Research in Music and Acoustics),
Department of Music, Stanford University
Stanford, California 94305-8180, USA
Phone: (650) 723-4971 Fax: (650) 723-8468
takako@ccrma.stanford.edu

Chris Chafe, Ph.D.
Duca Family Professor
CCRMA (Center for Computer Research in Music and Acoustics),
Department of Music, Stanford University
Stanford, California 94305-8180, USA
cc@ccrma.stanford.edu

Stacey Davis, Ph.D.
Associate Professor of Music Theory
Department of Music, University of Texas at San Antonio
Phone: (210) 458-5335
stacey.davis@utsa.edu