

Jessica Thompson

PhD Candidate in Cognitive Science and Neuropsychology

Contact

International Laboratory
for Research on Brain,
Music and Sound
1420 Boul. Mont-Royal
Université de Montréal
Montréal, Québec
H2V 4P3, Canada

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Languages

English and French

Programming

Python, MATLAB, Java,
shell scripting, \LaTeX
Facility with C/C++, SML,
LISP, Presentation,
SPSS Syntax, Max/MSP

Web Programming

Database management
and web application
development using
django, CouchDB,
ElasticSearch, and
PostgreSQL

Software Skills

BrainVoyager, AFNI

Operating Systems

Windows
Linux
OS X

Education

PhD Cognitive Science and Neuropsychology
Supervised by Marc Schönwiesner and Yoshua Bengio

Université de Montréal **2013–Now**

MA Digital Musics
Supervised by Michael Casey

Dartmouth College **2011–2013**

BA Psychology (Hons.), Computer Science, Music Technology
Supervised by Stephen McAdams, Evan Balaban and Robert Zatorre

McGill University **2006–2011**

Research Experience

Department of Cognitive Neuroscience, Maastricht University
Visiting Researcher

Maastricht, The Netherlands **2015–Now**

Use computational modelling and ultra high-field neuroimaging to study the computational mechanisms underlying human auditory perception

International Laboratory for Research on Brain, Music & Sound
Graduate Researcher

Montréal, Canada **2013–Now**

Employ multivariate pattern recognition techniques and fMRI to characterize the representation of spectro-temporal receptive fields in the human auditory cortex

Bregman Media Labs, Dartmouth College
Graduate Researcher

Hanover, USA **2011–2013**

Conducted fMRI and EEG experiments about neural decoding of various acoustic features

Distributed Digital Music Archives and Libraries Lab, McGill University
Programmer

Montréal, Canada **2008–2011**

Developed software in Java and Python for large-scale machine learning and information retrieval services

Auditory Cognitive Neuroscience Lab, Montreal Neurological Institute
Student Researcher

Montréal, Canada **2010–2011**

Assessed the effect of non-independence in region-of-interest (ROI) analysis

MEG Lab, Rotman Research Institute
Student Researcher

Toronto, Canada **2010**

Conducted MEG and behavioural experiments on auditory beating

Department of Psychology, McGill University
Student Researcher

Montréal, Canada **2010**

Explored multivariate statistical data analysis techniques for classification of biosignals

Music Perception and Cognition Lab, McGill University
Data Analyst

Montréal, Canada **2008–2009**

Employed several continuous data analysis techniques to analyse psychophysiological signals

Other Experience

Faculty of Psychology and Neuroscience, Maastricht University
Tutor for PSY2027: Research: How to do it?

Maastricht, The Netherlands **2015–Now**

Supervise a group of 2nd year undergraduate students while they carry out all aspects of a research project about auditory perception

Women in Machine Learning

Montréal, Canada **2014–2015**

Events and Logistics Chair for the 9th annual workshop

Coordinated sponsorship and made all local arrangements

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Distributed Digital Music Archives and Libraries Lab, McGill University

Montréal, Canada 2010–2011

Administrative Assistant

Assisted with preparing large-scale grant applications

McGill Psychology Undergraduate Research Journal

Montréal, Canada 2010–2011

Editor

Reviewed research article submissions

Publications

Journal articles

Human cortical responses to slow and fast binaural beats reveal multiple mechanisms of binaural hearing

Bernhard Ross, Takahiro Miyazaki, Jessica Thompson, Shahab Jamali, Takako Fujioka

Journal of Neurophysiology 112.8 (Oct. 2014) pp. 1871–1884. 2014

Sound envelope encoding in the auditory cortex revealed by neuromagnetic responses in the theta to gamma frequency bands

Takahiro Miyazaki, Jessica Thompson, Takako Fujioka, Bernhard Ross

Brain Research 1506 (2013) pp. 64–75. 2013

Peer-reviewed conference proceedings

Audio stimulus reconstruction using multi-source semantic embedding

Jessica Thompson, Michael Casey, Lorenzo Torresani

Neural Information Processing Systems (NIPS) workshop on Machine Learning and Interpretation in Neuroimaging (MLINI), 2013, Lake Tahoe, USA

Musical neurosemantic decoding using online weighted approximate-rank pairwise loss optimization in a joint semantic space

Jessica Thompson, Michael Casey, Lorenzo Torresani

Neural Information Processing Systems (NIPS) workshop on Machine Learning and Interpretation in Neuroimaging (MLINI), 2012

Digital document image retrieval using optical music recognition

Andrew Hankinson, John Ashley Burgoyne, Gabriel Vigliani, Alastair Porter, Jessica Thompson, Wendy Liu, Remi Chiu, Ichiro Fujinaga

Proceedings of the 13th International Society for Music Information Retrieval Conference (ISMIR), 2012, Porto, Portugal

Population codes representing musical timbre for high-level fMRI categorization of music genres

Michael Casey, Jessica Thompson, Olivia Kang, Thalia Wheatley

, 2012

Additions and improvements to the ACE 2.0 music classifier

Jessica Thompson, Cory McKay, John Ashley Burgoyne, Ichiro Fujinaga

Proceedings of the 10th International Conference on Music Information Retrieval (ISMIR), 2009, Kobe, Japan

Using the ACE XML 2.0 file formats to store and share music classification data

Cory McKay, John Ashley Burgoyne, Jessica Thompson, Ichiro Fujinaga

Proceedings of the 10th International Conference on Music Information Retrieval (ISMIR), 2009, Kobe, Japan

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Posters and abstracts

Encoding of dynamic ripple mixtures in human auditory cortex using 7T fMRI

Jessica Thompson, Federico De Martino, Marc Schönwiesner, Elia Formisano
Annual Meeting of the Organization for Human Brain Mapping (OHBM), 2016, Geneva, Switzerland

Reconstructing musical audio features from continuous single-trial EEG

Jessica Thompson, Michael Casey
Annual Meeting of the Organization for Human Brain Mapping (OHBM), 2014, Hamburg, Germany

Music imagery information retrieval: Bringing the song on your mind back to your ears

Sebastian Stober, Jessica Thompson
Proceedings of the 13th International Conference on Music Information Retrieval (ISMIR), 2012, Porto, Portugal

Predicting crowdsourced musical tags from brain activity

Jessica Thompson, Michael Casey, Lorenzo Torresani
Cognitively Based Music Information Retrieval (CogMIR), 2012, Toronto, Canada

Searching the *Liber Usualis*: Using CouchDB and ElasticSearch to Query Graphical Music Documents

Jessica Thompson, Andrew Hankinson, Ichiro Fujinaga
Proceedings of the 12th International Conference on Music Information Retrieval (ISMIR), 2011, Miami, USA

Transition from Transient to Steady-State Gamma-Band Responses: An MEG Study on Acoustic Beats

Takahiro Miyazaki, Jessica Thompson, Bernhard Ross
Annual Meeting of the Organization for Human Brain Mapping (OHBM), 2011, Québec, Canada

Left and right auditory cortices contribute differently to perception of slow and fast binaural beats

Takahiro Miyazaki, Jessica Thompson, Bernhard Ross
Annual Meeting of the Cognitive Neuroscience Society (CNS), 2011, San Francisco, USA

Behavioural and Neuromagnetic Responses to Peripheral and Central Auditory Beats

Jessica Thompson, Takahiro Miyazaki, Bernhard Ross
NSERC Auditory Cognitive Neuroscience summer workshop, 2010, Hamilton, Canada

Oral Presentations

Reconstructing musical audio features from continuous single-trial EEG

Jessica Thompson
Cognitively-Based Music Information Retrieval (CogMIR) workshop, 2013, Toronto, Canada

Music information retrieval from neurological signals: Towards neural population codes for music

Jessica Thompson
Conference of the Society for Music Perception and Cognition (SMPC), 2013, Toronto, Canada

Experience, perception, and physicality in experimental music: An argument for the role of neuroscience in music phenomenology

Jessica Thompson
Cognitio - Creative Minds: Cognitive Sources of Art and Discovery, 2013, Montreal, Canada

Data analysis of psychophysiological signals

Jessica Thompson, Finn Upham
Centre for Interdisciplinary Research on Music Media and Technology (CIRMMT) Workshop on psychophysiological measurements, 2010, Montreal, Canada

Psychophysiological and behavioural responses to violations of musical tuning schemas

Jessica Thompson
NSERC-CREATE Auditory Cognitive Neuroscience summer workshop, 2009, Montreal, Canada

Research theses

Neural decoding of subjective music listening experiences

Jessica Thompson

Masters thesis, Dartmouth College, Hanover, USA, 2013, supervised by Prof. Michael Casey

Validating Vul's Voodoo: A Case Study of Bias and Non-independence in Region of Interest Analysis

Jessica Thompson

Senior honours thesis, McGill University, Montreal, Canada, 2011, supervised by Prof. Robert Zatorre

Analysis of the Physiological Component of Emotional Responses to Music

Jessica Thompson

Junior honours thesis II, McGill University, Montreal, Canada, 2010, supervised by Prof. Evan Balaban

Psychophysiological and Behavioural Responses to Violations of Musical Tuning Schemas

Jessica Thompson

Junior honours thesis I, McGill University, Montreal, Canada, 2009, supervised by Prof. Stephen McAdams

Certifications

Scannexus

Maastricht, The Netherlands **May 2015**

Certified User for 7T MRI

Scannexus

Maastricht, The Netherlands **March 2015**

Certified User for 3T MRI

Faculty of Psychology and Neuroscience, Maastricht University

Maastricht, The Netherlands **March 2015**

Problem Based Learning tutor training

Associations

Women in Machine Learning (WiML)

2016–Now

Executive board member

International Speech Communication Association (ISCA)

2015–Now

Student member

Organization for Human Brain Mapping (OHBM)

2014–Now

Student member

Institute of Electrical and Electronic Engineers (IEEE)

2014–2015

Student member

Society for Music Perception and Cognition (SMPC)

2013–2015

Student member

International Society for Music Information Retrieval (ISMIR)

2009–2011

Student member