Maedbh **King**

PhD Candidate ·

67 Glen Avenue, #202, Oakland, CA, USA

(510) 570-5306 | maedbhking@gmail.com | www.maedbhking.com

Education

University of California, Berkeley
Berkeley, California

PH.D. IN PSYCHOLOGY (COGNITIVE NEUROSCIENCE) — *Sep. 2017 - Expected: May. 2022*

- Graduate Applied Data Science Certificate
- Advisor: Richard Ivry, PhD

Western University
London, Ontario

M.SC. IN NEUROSCIENCE — *Sep. 2015 - May. 2017*

- Advisor: Joern Diedrichsen, PhD

Trinity College Dublin
Dublin, Ireland

B.A. WITH HONORS IN PSYCHOLOGY AND FRENCH — *Sep. 2010 - May. 2014*

- Advisor: Redmond O'Connell, PhD

Experience

Cerebellum Learning Project
Berkeley, California

UNIVERSITY OF CALIFORNIA, BERKELEY — *2019 -*

- Used visualization tools: seaborn, matplotlib, pyplot to prepare figures for paper presentation.
- Used high performance computing cluster (savio) to run preprocessing and connectivity scripts.
- Wrote custom python scripts incorporating machine-learning tools: feature-based encoding, dimensionality reductions, regularized regression, to build connectivity models predicting cerebellar activation across learning.
- Wrote custom python scripts to preprocess fMRI data, utilizing fmriprep, freesurfer, nipype, scikit-learn etc.
- Recruited three undergraduate research assistants to collect behavioral and eyetracking data from 25 participants, totaling 100 hours, including behavioral piloting. In addition, I spent 300 hours collecting fMRI data.
- Used a python library (psychopy) to design a multi-task, multi-session fMRI experiment, the goal of which was to build models that could use activation from the cerebral cortex to predict activation in the cerebellum across learning in the human brain.

Cerebellum Transcriptomics Project
Berkeley, California

UNIVERSITY OF CALIFORNIA, BERKELEY — *2019 - 2021*

- Presented findings at domestic and international conferences and in a peer-reviewed paper.
- Used machine-learning tools: feature-based encoding, unsupervised learning including hierarchical clustering and principal component analysis, to cluster gene samples across the cerebellar cortex.
- Wrote custom python scripts utilizing python libraries (e.g., abagen) to preprocess transcriptomic data.
- Analyzed transcriptomic and MRI data from 6 postmortem human cerebella (data provided by Allen Human Brain Atlas). The goal of the project was to investigate genetic gradients in the human cerebellum.

Cerebellum Connectivity Project
Berkeley, California

UNIVERSITY OF CALIFORNIA, BERKELEY — *2017 - 2021*

- Used visualization tools: seaborn, matplotlib, pyplot to prepare figures for paper presentation.
- Used high performance computing cluster (savio) to run preprocessing and connectivity scripts.
- Wrote custom python scripts incorporating machine-learning tools: feature-based encoding, dimensionality reductions, regularized regression, to build connectivity models predicting cerebellar activation.
- This project was the result of an international collaboration with researchers in Canada, the goal of which was to map connectivity patterns between the cerebral cortex and the cerebellum in the human brain.

Cerebellum Language Project
Berkeley, California

UNIVERSITY OF CALIFORNIA, BERKELEY — *2019 - 2021*

- Supervised the student in preparing and presenting her findings at a department colloquium. I also supervised the student in writing her honors thesis on the project.
- Recruited and mentored an undergraduate student to analyze the patient data using custom written python scripts.
- Tested patients with spinocerebellar ataxia to investigate whether the cerebellum plays an important role in language production.

Cerebellum Mapping Project
Berkeley, California

UNIVERSITY OF CALIFORNIA, BERKELEY — *2017 - 2019*

- Presented findings at domestic and international conferences and in a peer-reviewed paper.
- The evaluation was done using open-source datasets, Human Connectome Project and Multi-Domain Task Battery.
- The goal of this project was to evaluate functional boundaries of the human cerebellum using a novel statistical metric known as the boundary-controlled distance coefficient.

Multi-Domain Task Battery Project *London, Ontario*

Western University *2015 - 2017*

- The rich dataset that I generated has been made publicly available on openneuro.org and has been downloaded by hundreds of researchers.
- Used semi non-negative matrix factorization to generate a functional map of the human cerebellum.
- Collected fMRI and eyetracking data from 25 participants, totaling 400 hours, including behavioral piloting.
- Designed a multi-session, multi-task experiment with the goal of mapping the human cerebellum.

Honors & Awards

2020	**University of California, Berkeley**, Mark R. Rosenzweig Graduate Fellowship	*Berkeley, CA*
2018	**Cognitive Computational Neuroscience Conference**, Student Travel Award ($250)	*Philadelphia, PA*
2015	**Irish Research Council**, Postgraduate Scholarship ($141,0000; declined)	*Dublin, Ireland*
2015	**Trinity College Dublin**, Ussher Fellowship ($84,000; declined)	*Dublin, Ireland*
2014	**US Fulbright Program**, Fulbright Student Award (Shortlisted)	*Dublin, Ireland*
2012	**Wellcome Trust**, Biomedical Vacation Scholarship ($2,500)	*London, U.K*
2011	**Trinity College Dublin**, Junior Freshman Prize ($100)	*Dublin, Ireland*
2010	**Trinity College Dublin**, Entrance Scholarship ($450)	*Dublin, Ireland*
2010	**Department of Education, Government of Ireland**, Irish Language Scholarship ($60,000)	*Dublin, Ireland*

Papers

Evaluating brain parcellations using the distance controlled boundary coefficient *bioRxiv*

D Zhi, M King, J Diedrichsen *2021*

Continuous manipulation of mental representations is compromised in cerebellar degeneration *bioRxiv*

SD McDougle, J Tsay, B Pitt, M King, W Saban, JA Taylor, RB Ivry *2021*

Transcriptomic Gradients Of The Human Cerebellum *bioRxiv*

M King, Z Zhen, RB Ivry, KS Weiner *2020*

Functional boundaries in the human cerebellum revealed by a multi-domain task battery *Nature Neuroscience*

M King, CR Hernandez-Castillo, RA Poldrack, RB Ivry, J Diedrichsen *2019*

Universal transform or multiple functionality? Understanding the contribution of the human cerebellum across task domains *Neuron*

J Diedrichsen, M King, C Hernandez-Castillo, M Sereno, RB Ivry *2019*

Visualizing Topographic Independent Component Analysis with Movies *arXiv*

Z Chen, D Parvin, M King, S Hao *2019*

Unique degeneration signatures in the cerebellar cortex for spinocerebellar ataxias 2, 3, and 7 *NeuroImage: Clinical*

CR Hernandez-Castillo, M King, J Diedrichsen, J Fernandez-Ruiz *2018*

Individual differences in resting corticospinal excitability are correlated with reaction time and GABA content in motor cortex *Journal of Neuroscience*

I Greenhouse, M King, S Noah, RJ Maddock, RB Ivry *2017*

Towards a multi-function mapping of the cerebellar cortex *Brain*

M King, C Hernandez-Castillo, J Diedrichsen *2017*

Neural adaptations associated with interlimb transfer in a ballistic wrist flexion task *Frontiers in human neuroscience*

KL Ruddy, AK Rudolf, B Kalkman, M King, A Daffertshofer, TJ Carroll, R Carson *2016*

Registered reports for student research

M King, F Dablander, L Jakob, M Agan, F Huber, J Haslbeck, K Brecht

Journal of European Psychology Students

2016

A critical evaluation of the essentialist debate: do fathers make a unique contribution to child development?

M King

Student Psychology Journal of Ireland

2015

The locus coeruleus-noradrenergic arousal function modulates perceptual decision-making in humans: evidence from pupillometry

M King, R O'Connell

Unpublished Undergraduate Honors Thesis

2014

Poster Presentations

Predicting brain activation maps for arbitrary tasks with ontology-based encoding models

J Walters, M King, P Bissett, Ivry, J Diedrichsen, R Poldrack

2021

Organization for Human Brain Mapping Conference

Virtual Conference

Evaluating Brain Parcellations using the Multi-Domain Task Battery

J Diedrichsen, M King, C Hernandez-Castillo, D Zhi, R Ivry

2019

Organization for Human Brain Mapping Conference

Rome, Italy

Evaluating different functional parcellations of the basal ganglia

C Hernandez-Castillo, M King, I Harding, J Diedrichsen, R Ivry

2019

Organization for Human Brain Mapping Conference

Rome, Italy

Transcriptomic Gradients of the Human Cerebellum

M King, R Ivry, K Weiner

2019

Cerebellum Gordon Research Conference

Les Diablerets, Switzerland

A multi-domain task battery reveals the functional topography of the human cerebellum

M King, C Hernandez-Castillo, R Poldrack, R Ivry, J Diedrichsen

2018

The Society for Neuroscience Conference

San Diego, California

A multi-domain task battery reveals the functional topography of the human cerebellum

M King, C Hernandez-Castillo, R Poldrack, R Ivry, J Diedrichsen

2018

Computational and Cognitive Neuroscience Conference

Philadelphia, Pennsylvania

Navigating the "Little Brain": Comprehensive mapping of cognitive function in the human cerebellum

M King, R Ivry, J Diedrichsen

2017

Helen Wills Neuroscience Retreat

Lake Tahoe, California

Navigating the "Little Brain": Comprehensive mapping of cognitive function in the human cerebellum

M King, R Ivry, J Diedrichsen

2017

Organization for Human Brain Mapping Conference

Vancouver, British Colombia

Mapping the Human Cerebellum

M King, R Ivry, J Diedrichsen

2017

Cerebellum Gordon Conference

Lewiston, Maine

Transcranial magnetic stimulation measures of intrinsic motor system excitability and task-based inhibition exhibit intra-subject stability across weeks

I Greenhouse, M King, R Ivry

2015

Society for Neuroscience Conference

Chicago, Illinois

Electroencephalography (EEG) signatures of impairment in cognitive, sensory and motor networks in Amyotrophic Lateral Sclerosis (ALS) disease

Annual ALS Irish Meeting

B Nasseroleslami, K Mohr, M King, O Hardiman

Dublin, Ireland

2015

Invited Talks

Bringing a systems level perspective to neuroimaging analyses

Organization for Human Brain Mapping

Educational Symposium: Neuroanatomy for neuroimaging

Virtual Conference

2021

Transcriptomic gradients of the human cerebellum

University of California, Berkeley

Cognitive Neuroscience Colloquium

Berkeley, California

2020

Mapping the Human Cerebellum Using a Multi-Domain Task Battery

Society for Neuroscience

Symposium: New Perspectives on Cerebellar Function: Implications for Mental Health

Chicago, Illinois

2019

A multi-domain task battery reveals the functional topography of the human cerebellum

Helen Wills Neuroscience Institute

UCB Neuroscience Retreat

Richmond, California

2018

Mapping the Human Cerebellum

Cerebellum Gordon Research Conference

Seminar: Theories and Models of Cerebellar Function

Lewiston, Maine

2017

Mentorship

Sienna Bruinsma

Honors Thesis Student

Psychology, University of California, Berkeley

Thesis Title: Evaluating the functional role of the cerebellum in linguistic processing

Sep. 2019 -

Shannon Lee

Honors Thesis Student

Cognitive Science, University of California, Berkeley

Thesis Title: Eye-tracking and context models inform social learning

Sep. 2019 - May 2021

Zanib Naaem

Research Assistant

Psychology, University of California, Berkeley

Cerebellum Learning Project

Jan. 2021 - May 2021

Amanda LeBel

Ph.D. Rotation Student

Neuroscience, University of California, Berkeley

Cerebellum Connectivity Project

Sep. - Dec. 2020

Yiling Kao

Research Assistant

Computer Science, University of California, Berkeley

Cerebellum Language Project

Sep. 2019 - May 2020

Dylan Benkley

Post-Baccalaureate Student

Psychology, University of California, Berkeley

Cerebellum Connectivity Project

Sep. - Dec. 2018

Mark Gorenstein

Ph.D. Rotation Student

Neuroscience, University of California, Berkeley

Cerebellum Connectivity Project

Sep. - Dec. 2018

Teaching

General Psychology — *Mount Tamalpais College*
Lecturer — *San Quentin State Prison*
Sep. - Dec. 2019

English Literature — *Mount Tamalpais College*
Tutor — *San Quentin State Prison*
Jan. - Mar. 2020 (semester ended early due to the COVID-19 pandemic)

Human Neuroanatomy, PSYCH 111 — *University of California, Berkeley*
Guest Lecturer — *Berkeley, California*
May 2019 and May 2020

Biological Psychology, PSYCH 110 — *University of California, Berkeley*
Graduate Student Instructor — *Berkeley, California*
Aug. - Dec. 2018

Cognitive Neuroscience, PSYCH 127 — *University of California, Berkeley*
Graduate Student Instructor — *Berkeley, California*
Aug. - Dec. 2017

Introduction to Statistics, STAT 1024 — *Western University*
Graduate Student Instructor — *London, Ontario*
Jan. - May. 2017

Probability and Statistics, STAT 2857 — *Western University*
Graduate Student Instructor — *London, Ontario*
Sep. - Dec. 2016

Biology/Statistics, STAT 2244 — *Western University*
Graduate Student Instructor — *London, Ontario*
Sep. 2015 - May. 2016

Outreach

Graduate Assembly Students of Psychology — *University of California, Berkeley*
Member and RSO Signatory — *Sep. 2018 -*

- Created Berkeley Psychology blog intended to spotlight graduate student research.
- Co-founded and operated twitter account for Berkeley Psychology.
- Writer/Contributor of Berkeley Psychology newsletter.
- Data analysis, statistics and visualization for Psychology state of the department annual meeting.
- Co-wrote mentorship agreement and lab policy documents for Berkeley psychology.
- Member of fundraising committee, attended Berkeley Psychology faculty talks in Silicon Valley.

Prison University Project — *Richmond, California*
Volunteer — *Sep. 2020-*

- During the COVID-19 pandemic, created care packages and holiday art for incarcerated people in California prisons.

Bay Area Scientists in Schools (BASIS) — *University of California, Berkeley*
Volunteer — *Jan. 2018 - Jan. 2020*

- Presented multiple lectures on the ”Feel Human Brains” to elementary school children in Bay Area schools.

Inspiring Young Women in STEM Inaugural Conference — *Western University*
Organizing Member — *2016*

- Recruited keynote speakers and evaluated student research.

Western Women Neuroscientists in Schools — *Western University*
Volunteer — *Oct. 2015 - May 2017*

- Presented multiple lectures on ”Myths and the Brain” to secondary school children in London, Ontario schools.

Brain Bee — *Western University*
Volunteer — *May 2016 and May 2017*

- Member of the organizing committee for the London Brain Bee, a neuroscience event that introduces high school students to neuroanatomy.

Schulich School of Medicine Graduate Council — *Western University*
Secretary — *2015 - 2016*

- Took notes at biweekly committee meetings and voted on council plans.

Journal of European Psychology Students — *European Federation of Psychology Students' Association*

Junior Editor — *2014 - 2016*

- Edited research/review paper submissions, recruited reviewers, copy editors, and communicated decision outcome to authors.

Niteline (Student Helpline) — *Trinity College, Dublin*

Publicity Officer and Volunteer — *2011 - 2013*

- Provided crisis support to students and publicized the student helpline services at national events.

Student-to-Student (S2S) — *Trinity College, Dublin*

Peer Mentor — *2011 - 2012*

- Provided after-school homework support to children on the autism spectrum.

Languages

English	Native
Irish	Native
French	Proficient
German	Basic