

Maedbh King

· PH.D. CANDIDATE ·

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Summary

Cognitive and computational neuroscientist with 7+ years experience designing hypothesis-driven experiments, and using machine learning to build predictive models of brain function. Strong publication record (>300 citations). Passionate about teaching and mentorship, and science and technology policy. Motivated to apply my quantitative and communication skills to high-impact projects that serve the American public.

Education

University of California, Berkeley

Berkeley, California

PH.D. IN COGNITIVE NEUROSCIENCE (GPA: 3.96/4.00)

Sep. 2017 - Expected: May, 2022

- **Advisor: Richard Ivry, Ph.D.**
- Graduate Certificate in Applied Data Science [Link]

Western University

London, Ontario

M.Sc. IN NEUROSCIENCE (GPA: 4.0)

Sep. 2015 - May, 2017

- **Advisor: Joern Diedrichsen, Ph.D.**

Trinity College Dublin

Dublin, Ireland

B.A. WITH HONORS IN PSYCHOLOGY AND FRENCH (DOUBLE MAJOR; GPA: 4.0)

Sep. 2010 - May, 2014

- **Advisor: Redmond O'Connell, Ph.D.**

Recognition

SCHOLARSHIPS

2021	Mark R. Rosenzweig Graduate Fellowship , Department of Psychology, University of California, Berkeley	Link
2015	Government of Ireland Postgraduate Scholarship (Declined) , Irish Research Council	Link
2015	Ussher Fellowship (Declined) , Trinity College Dublin	Link
2013	Biomedical Vacation Scholarship , Wellcome Trust, UK	Link
2010	Government of Ireland Scholarship (Full-Ride) , Department of Education and Skills	Link

AWARDS

2020	Cognitive Computational Neuroscience Travel Award , CCN Conference	Link
2017	Gordon Cerebellum Student Travel Award , Gordon Research Conferences	Link
2014	US Fulbright (Shortlisted) , Fulbright Program	Link
2010	Entrance Exhibition Award , Trinity College Dublin	Link

RESEARCH IMPACT

2020	The mysterious, multifaceted cerebellum , Knowable Magazine	Link
2019	Scientists map our underappreciated "little brain" , University of California, Berkeley	Link
2019	New maps of the cerebellum show how our "little brain" works , Psychology Today	Link

Research Experience

Ph.D. Thesis: Mapping cerebro-cerebellar networks of the human brain during learning

[Github \[Link\]](#)

GRADUATE STUDENT RESEARCHER (2017-)

University of California, Berkeley

- Deployed *machine learning* pipelines to predict cognitive function across learning in the *human cerebellum*. My work requires knowledge of advanced statistics and expertise in Python programming to analyze high-dimensional and complex neural data.
- *Led a team of 8* to design and collect *300 experimental hours* of functional magnetic resonance imaging (fMRI) and eye-tracking data.
- Co-wrote an *R35 grant* that received 5-year funding from the *NIH* and *managed an IRB protocol* for neuroimaging experiments.
- Created a widely adopted *mentorship agreement* for research assistants to ensure *transparency and accountability* in mentoring practices. Co-*led a journal club* for undergraduate research assistants, *instructing* them on the *scientific method* and appropriate methods and statistics.
- *Mentored two undergraduate students* in designing and writing up honors thesis projects. One student was awarded a *Swann prize* for their work, and presented at a national conference. Prioritized *recruitment* of students from marginalized demographics.

M.Sc. Thesis: Understanding the functional organization of the human cerebellum

[Paper \[Link\]](#)

GRADUATE STUDENT RESEARCHER (2015-2017)

Western University

- My thesis used *machine learning* and *advanced statistics* to produce a novel and highly downloaded map of the human cerebellum.
- *Led a team of 2* to design and collect a 26-task, 6-session *fMRI* and behavioral experiment, totaling 250 hours of data collection.
- *Initiated a collaboration* with scientists from Stanford University to use *natural language processing and regularized regression* to assign cognitive labels (*cognitiveatlas.org*) to the human cerebellum. Developed pipeline for other researchers to replicate my novel approach.
- Invested in *open-source science*. My data, which are publicly available on *openneuro.org* [\[Link\]](#), have been downloaded >200 times.

Selected Projects

LEADERSHIP & MANAGEMENT

Graduate Mentoring Policies

[Leader \[Link\]](#)

JAN. 2020 - SEP. 2021

- Recognized need for formal mentor-mentee agreements in Berkeley psychology department. Assembled and co-led *working committee* consisting of professors and student to create *policy* to improve *lab culture* and *mentor-mentee* relationships.
- Authored *10-page* policy document on *mentorship and lab policy agreements*, and included new policies on conflict resolution and professional development guidelines. Advised organizational leadership on implementation of new departmental policies.

Prison University Project

[Lecturer \[Link\]](#)

JAN. 2019 - MAY 2019

- *Designed* and lectured a new curriculum in General Psychology for incarcerated students in *San Quentin State Prison*. Provided executive board with formal analysis and evaluation of course curricula, management practices, and organizational operations.

State of the Department Initiative

[Leader \[Link\]](#)

APR. 2019 - APR. 2021

- Team leader for faculty accountability initiative. Developed survey for Berkeley Psychology *state of the department* annual meeting, and conducted *data analytics* and *statistics* to translate graduate student concerns into policy recommendations. Used data and statistics to *highlight* funding discrepancy between neuroscience and clinical psychology students, resulting in a 20% yearly increase in graduate student stipends.

TECHNICAL

SUITPy: Open-source package for the visualization of cerebellum imaging data

[Developer \[Link\]](#)

JAN. - SEP. 2021

- Core developer of *SUITPy*, an open-source *Python* toolbox based on a highly popular *MATLAB* toolbox. Subsequently worked as project manager to identify best coding practices for improving core functionality, resulting in record monthly installations (*4-fold increase*).

Predicting COVID-19 mortality rates across the U.S. using mobility and census data

[Author \[Link\]](#)

SEP. - DEC. 2020

- Built model predicting *COVID-19* deaths in the U.S. from May - Aug. 2020 using data from the 2019 *U.S. Census* and *Google Maps* mobility reports. Increased optimization of algorithm by *20-fold*. Presented findings in a poster presentation to faculty in the School of Information

Low dimensional embedding of genetic gradients in the human cerebellum

[Author \[Link\]](#)

MAY 2019 - SEP. 2021

- *Initiated* collaboration with incoming faculty at Berkeley to investigate *genetic gradients* in the *human cerebellum*. Learned new tools to analyze postmortem human brain data, and subsequently developed pipeline to streamline data preprocessing, later adopted by >5 students.

Universal transform or multiple functionality? A novel perspective on the cerebellum

[Author \[Link\]](#)

MAY 2018 - SEP. 2019

- *Reviewed* and *analyzed 30 years* of research to propose new theory of cerebellar function. Co-authored subsequent paper (>70 citations).

Public Service & Outreach

COMMITTEES & POLICY

Graduate Assembly Students of Psychology

[Member and RSO Signatory](#)

UNIVERSITY OF CALIFORNIA, BERKELEY

Sep. 2018 - Mar. 2020

- Provided data analytics to improve efficiency of phone banking for Psychology "Big Give". Contacted *10-fold* more donors than previous year.
- Liaison officer between Berkeley development office and external donors. Organized *faculty fundraisers* in Silicon Valley, fundraising \$15,000.

Schulich School of Medicine Graduate Council

[Secretary](#)

WESTERN UNIVERSITY

Sep. 2015 - Sep. 2016

- Provided analysis and evaluation of policies and quarterly goals to council. Served as student liaison officer, and oversaw a *budget* of \$5000

Niteline (Student Helpline)

[Publicity Officer](#)

TRINITY COLLEGE, DUBLIN

Sep. 2011 - May 2014

- Provided practical *program consultation* to student helpline and wrote proposal to increase the *yearly budget* from \$5,000 to \$10,000.

European Federation of Psychology Students' Association

[Editor \[Link\]](#)

EUROPEAN UNION

Jan. 2016 - May 2016

- *Spearheaded* initiative to pre-register scientific results in the Journal of European Psychology Students, a *first* for student journals.
- *Advised* organization leadership on *best practices* for successful implementation and authored subsequent journal article (>3500 views).

SCIENCE COMMUNICATION

Bay Area Scientists in Schools (BASIS)

[Team Leader](#)

UNIVERSITY OF CALIFORNIA, BERKELEY

Jan. 2018 - Jan. 2020

- *Developed and deployed* neuroscience curriculum that has been presented to elementary students in >20 Bay Area public schools.

Journal of European Psychology Students

[Editor/Contributor \[Link\]](#)

EUROPEAN UNION

Jan. 2014 - May 2016

- Managed *peer review process* including paper submission, reviewer recruitment, copy editing, and publication.
- Contributor to popular psychology and neuroscience blog post (>500 monthly views).

Graduate Assembly Students of Psychology

[Writer/Contributor \[Link\]](#)

UNIVERSITY OF CALIFORNIA, BERKELEY

Sep. 2019 - May 2021

- *Created, managed, and edited* Berkeley Psychology blog to *spotlight* graduate student research. Increased monthly viewers 5-fold.
- *Co-founded and operated* Twitter account for Berkeley Psychology. Increased follower count to 2,000 after 2 years.
- *Writer* of Berkeley Psychology *newsletter*. Incorporated section on recent graduates to strengthen ties with alumni community.

WOMEN IN STEM

Inspiring Young Women in STEM Inaugural Conference

[Organizing Member](#)

WESTERN UNIVERSITY

2016

- *Co-organized* first conference for 150 women in STEM at Western University, *recruited* keynote speakers, and *evaluated* student research.

Western Women Neuroscientists in Schools

[Team Leader](#)

WESTERN UNIVERSITY

Oct. 2015 - May 2017

- *Developed curriculum* to explore neuroscience misinformation ("Myths and the Brain"). Presented to >2000 highschoolers in Ontario schools.

Mentorship

Honors Thesis Students

[Shannon Lee; Sienna Bruinsma](#)

SEP. 2019 - MAY 2021

Cognitive Science; Psychology

- Shannon Lee's thesis developed eye-tracking and context models to inform social learning.
- Sienna Bruinsma's thesis evaluated the functional role of the cerebellum in linguistic processing using neuropsychology.

Undergraduate Research Assistants

[Zanib Naaem; Yiling Kao](#)

JAN. 2021 - MAY 2021; SEP. 2019 - MAY 2020

Psychology; Computer Science

- Zanib Naaem tested healthy college-aged students on a multi-session eye-tracking and behavioral learning project.
- Yiling Kao developed a verb generation task and used machine learning to study speech envelopes.

Ph.D. Rotation Students

[Amanda LeBel; Jacob Zientz;](#)

[Mark Gorenstein](#)

SEP. - DEC. 2020; JAN. - MAY 2020; SEP. - DEC. 2018

Neuroscience

- Amanda LeBel developed encoding models using speech features to study task-evoked cerebellar activity.
- Jacob Zientz set up fMRI preprocessing scripts (BIDS and fMRIPrep) on multi-session cerebellar data.
- Mark Gorenstein worked on preprocessing pipelines for cerebro-cerebellar connectivity models.

Teaching

General Psychology

[Mount Tamalpais College](#)

LECTURER

San Quentin State Prison

Sep. - Dec. 2019

Biological Psychology, PSYCH 110; Cognitive Neuroscience, PSYCH 127

[University of California, Berkeley](#)

GRADUATE STUDENT INSTRUCTOR

Berkeley, California

Aug. - Dec. 2018 and Aug. - Dec. 2017

Introduction to Statistics, STAT 1024; Probability and Statistics, STAT 2857

[Western University](#)

GRADUATE STUDENT INSTRUCTOR

London, Ontario

Jan. - May. 2017; Sep. - Dec. 2016

Selected Communication

PAPERS

Evaluating brain parcellations using the distance controlled boundary coefficient

D ZHI, M KING, J DIEDRICHSEN

[bioRxiv](#)

2021

Transcriptomic Gradients Of The Human Cerebellum

M KING, Z ZHEN, RB IVRY, KS WEINER

[bioRxiv](#)

2020

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

M KING, CR HERNANDEZ-CASTILLO, RA POLDRACK, RB IVRY, J DIEDRICHSEN

[Nature Neuroscience](#)

2019

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

J DIEDRICHSEN, M KING, C HERNANDEZ-CASTILLO, M SERENO, RB IVRY

[Neuron](#)

2019

Towards a multi-function mapping of the cerebellar cortex

M KING, C HERNANDEZ-CASTILLO, J DIEDRICHSEN

[Brain](#)

2017

CONFERENCES

Cerebro-cerebellar connectivity is dominated by divergent mapping

M KING, L SHAHSHAHANI, IVRY, J DIEDRICHSEN

2021

[Society for Neuroscience](#)

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](#)

Rome, Italy

Transcriptomic Gradients of the Human Cerebellum

M KING, R IVRY, K WEINER

2019

[Cerebellum Gordon Research](#)

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

[Computational and Cognitive Neuroscience](#)

Philadelphia, Pennsylvania

INVITED TALKS

Cerebro-cerebellar connectivity across motor and cognitive circuits

NEUROPHYSIOLOGISCHES SEMINAR

2021

[Neurologische Uniklinik Essen](#)

Virtual Conference

Bringing a systems level perspective to neuroimaging analyses

EDUCATIONAL SYMPOSIUM: NEUROANATOMY FOR NEUROIMAGING

2021

[Organization for Human Brain Mapping](#)

Virtual Conference [Link]

Mapping the Human Cerebellum Using a Multi-Domain Task Battery

SYMPOSIUM: NEW PERSPECTIVES ON CEREBELLAR FUNCTION: IMPLICATIONS FOR MENTAL HEALTH

2019

[Society for Neuroscience](#)

Chicago, Illinois

Mapping the Human Cerebellum

SEMINAR: THEORIES AND MODELS OF CEREBELLAR FUNCTION

2017

[Cerebellum Gordon Research](#)

Lewiston, Maine

Skills

Programming Languages

Python, SQL, R, MATLAB, HTML, Bash

Frameworks and Tools

Keras, OpenCV, Git, Vim, Blender, Numpy, Deeplabcut, PsychoPy, Pandas, NumPy, Scikit-learn, Scipy

Interpersonal

Project management, Organizational leadership, Resourcefulness, Problem solving, Conflict resolution

Conceptual

High performance computing (Savio), MRI certificate from Henry H. Wheeler Jr. Brain Imaging Center

Languages

English (Native), Irish (Native), French (Proficient), German (Basic)