

# Maedbh King

· PH.D. CANDIDATE IN COGNITIVE NEUROSCIENCE · UC BERKELEY ·

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## Summary

5+ years experience in designing and testing multi-task fMRI/pupillometry/behavioral experiments and applying machine learning to build predictive models of cerebellar function. Research pursuits dovetail with keen interest in technology policy. Cautiously optimistic about the future of AI.

## Education

### University of California, Berkeley

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

[Berkeley, California](#)

Sep. 2017 - Expected: Dec. 2022

- **Advisor: Richard Ivry, Ph.D.**
- Applied Data Science Certificate, School of Information. Awards: Mark R. Rosenzweig Graduate Fellowship (2021); Cognitive Computational Neuroscience Travel Award (2020)

### Western University

M.SC. IN NEUROSCIENCE (GPA: 4.0)

[London, Ontario](#)

Sep. 2015 - May. 2017

- **Advisor: Joern Diedrichsen, Ph.D.** Awards: Gordon Cerebellum Student Travel Award (2017)

### Trinity College Dublin

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

[Dublin, Ireland](#)

Sep. 2010 - May. 2014

- **Advisor: Redmond O'Connell, Ph.D.** Awards: Irish Research Council Postgraduate Scholarship (2015); Ussher Fellowship, Trinity College Dublin (2015); US Fulbright Program (shortlisted); Wellcome Trust Biomedical Scholarship (2014); Entrance Scholarship, Trinity College Dublin

## Experience

### Thesis: Mapping cerebro-cerebellar networks of the human brain during learning

[Github \[Link\]](#)

UNIVERSITY OF CALIFORNIA, BERKELEY

Graduate Researcher (2017-)

- Led a team of 9 (3 Ph.D. students, 5 research assistants, 1 postbac student) to design and collect 300 hours of fMRI and eye-tracking data.
- Used machine learning to predict cerebro-cerebellar connectivity across learning, features were extracted by parcellating the human cerebral cortex and feature selection was performed with L1 regularization. Used dimensionality reduction (PCA, ICA), clustering, regression, permutation tests to analyze behavioral and eye-tracking data to predict learning performance on movie-based action tasks.

### Thesis: Understanding the functional organization of the human cerebellum

[Paper \[Link\]](#)

WESTERN UNIVERSITY

Graduate Researcher (2015-2017)

- Led a team of 2 (1 research assistant and one post-doctoral fellow) to design and collect a 26-task fMRI experiment and used machine learning (semi non-negative matrix factorization) to generate a novel functional map of the human cerebellum.
- Applied natural language processing and regularized regression to assign cognitive labels (cognitiveatlas.org) to the human cerebellum. Invested in open-source science. My data, which are publicly available on openneuro.org, have been downloaded by hundreds of researchers.

## Selected Projects

### TECHNICAL

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

[Github \[Link\]](#)

2021

- Core developer of SUITPy, an open-source Python toolbox based on a highly popular MATLAB toolbox. I implemented mapping of brain data to 2D surface space and incorporated brain atlases from open-source repositories.

#### Evaluating functional boundaries of the brain using a novel distance coefficient

[Paper \[Link\]](#)

2021

- Co-developed a novel statistical metric to evaluate the validity of brain parcellations, an advancement on Homogeneity and Silhouette coefficients. Evaluated metric on open-source brain data from Human Connectome Project.

#### Low dimensional embedding of genetic gradients in the human cerebellum

[Paper \[Link\]](#)

2021

- Investigated genetic gradients in the human cerebellum using postmortem data from the Allen Human Brain Atlas. Used feature-based encoding to locate gene samples in the cerebellum, and hierarchical clustering and PCA to determine organizational structure of genetic gradients.

### POLICY & OUTREACH

#### Graduate Assembly Students of Psychology

[Blog \[Link\]](#)

UNIVERSITY OF CALIFORNIA, BERKELEY

Sep. 2018 -

- Led a working committee to create department-wide lab policy and mentorship agreements. Created and managed Berkeley Psychology blog.

#### Prison University Project

[Lecturer \[Link\]](#)

RICHMOND, CALIFORNIA

Sep. 2019 - Mar. 2021

- Designed and lectured a course in cognitive science, focusing on ethics & AI, to incarcerated students in San Quentin State Prison.

#### Journal of European Psychology Students

[Paper \[Link\]](#)

EUROPEAN FEDERATION OF PSYCHOLOGY STUDENTS' ASSOCIATION

2014 - 2016

- Spearheaded registered reports initiative, and managed peer review process from submission to publication.

## 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