Maedbh **King**

· Ph.D. Candidate in Cognitive Neuroscience · UC Berkeley ·

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Summary

Cognitive and computational neuroscientist with leadership experience in academia and non-profit work. 6+ years experience conducting hypothesis- and data-driven research, and using machine learning and statistics to build models of brain function. Strong record of publishing in scientific journals (>350 citations), and presenting at research conferences (>10 proceedings). Passionate about using my experience as an educator and academic mentor to communicate complex ideas to non-expert audiences. Strongly believe in using data-driven solutions to formulate and recommend policy. Motivated to apply my quantitative and communication expertise to high-impact projects that promote health-care solutions.

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.** Awards: Presidential Management Fellowship Finalist (2022) [*link*]; Mark R. Rosenzweig Fellowship (2021) [*link*]; Cognitive and Computational Neuroscience Travel Award (2020) [*link*]
- Graduate Certificate in Applied Data Science, School of Information [*link*]

Western University — *London, Ontario*

M.Sc. in Neuroscience (GPA: 4.0) — *Sep. 2015 - May. 2017*

- **Advisor: Joern Diedrichsen, Ph.D.** Awards: Gordon Cerebellum Student Travel Award (2017) [*link*]; Irish Research Council Postgraduate Scholarship (2015) [*link*]; Ussher Fellowship (2015) [*link*]

Trinity College Dublin — *Dublin, Ireland*

B.A. in Psychology and French (Double Major; GPA: 4.0) — *Sep. 2010 - May. 2014*

- **Advisor: Redmond O'Connell, Ph.D.** Awards: US Fulbright Program (2014; shortlisted) [*link*]; Wellcome Trust Biomedical Scholarship (2014) [*link*]; Entrance Scholarship, Trinity College Dublin (2010) [*link*]; Government of Ireland Postgraduate Scholarship (Full-Ride; 2010) [*link*]

Experience

Thesis: Mapping cerebro-cerebellar networks of the human brain during learning — *Github [link]*

University of California, Berkeley — *Graduate Researcher (2017-)*

- Developed machine learning pipelines to predict cognitive function in the human cerebellum during learning, tested patients with spinocerebellar ataxia on a series of cognitive tasks to assess cerebellar deficits, analyzed post-mortem human brain data to create a transcriptomic map of the human cerebellum, and led a team of 5 to collect 300 experimental hours of functional magnetic resonance imaging (fMRI) data (during COVID-19 pandemic).
- Co-wrote an R35 grant that received 5-year funding from the NIH. Managed an institutional review board (IRB) protocol for fMRI 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, data analysis, and statistics.

Thesis: Understanding the functional organization of the human cerebellum — *Paper [link]*

Western University — *Graduate Researcher (2015-2017)*

- Created a novel map of the human cerebellum by applying matrix factorization to high-dimensional neural data [*link*].
- Initiated a collaboration with scientists from Stanford University to use natural language processing and regularized regression to assign cognitive labels *[link]* to the human cerebellum. Invested in open-source science, the data are publicly available and have been downloaded >200 times [*link*].

Selected Projects

SUITPy: Open-source package for the visualization of cerebellum imaging data — *Library [link]*

Western University; University of California, Berkeley — *2021*

- Core developer of *SUITPy*, an open-source Python toolbox to visualize cerebellum data. Identified best programming practices for improving core functionality, resulting in novel implementation of 2D surface mapping and incorporation of brain atlases from open-source repositories.

Low dimensional embedding of genetic gradients in the human cerebellum — *Paper [link]*

Helen Wills Neuroscience Institute, University of California, Berkeley — *2021*

- Investigated genetic gradients in the human cerebellum using postmortem brain data from the Allen Human Brain Atlas [*link*].

Evaluating functional boundaries of the brain using a novel distance coefficient — *Paper [link]*

Western University; University of California, Berkeley — *2021*

- Co-developed a novel statistical metric to evaluate the validity of brain parcellations, an advancement on Homogeneity and Silhouette coefficients.

Predicting brain activation maps for arbitrary tasks with cognitive encoding models — *Poster [link]*

Stanford University; University of California, Berkeley — *2021*

- Used natural language processing to extract features from a cognitive ontology and built machine learning models to predict novel brain data.

Cross Platform Integration of Clinical Data — *Team Leader*

Department of Psychology, University of California, Berkeley — *2020*

- Implemented and maintained data warehousing for clinical projects that contained sensitive patient information (e.g., disease etiology).

State of the Department Initiative — *Team Leader [Link]*

Department of Psychology, University of California, Berkeley — *2020*

- Used data to highlight funding discrepancy between neuroscience and clinical graduate students, resulting in a 20% yearly increase in stipends.

Skills & Interests

Programming Languages Python, SQL, R, MATLAB, HTML, Bash

Frameworks and Tools Keras, Nipype, Scikit-learn, Pandas, NumPy, Scipy, OpenCV, Deeplabcut, Git, Vim, Blender, High Performance Computing

Hobbies Road Biking, Yoga, Running, Mountain Climbing, Fiddle Playing (traditional Irish music), Crosswords