

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

Graduate Researcher (2017-)

Github [link]

THESIS: MAPPING CEREBRO-CEREBELLAR NETWORKS OF THE HUMAN BRAIN DURING LEARNING

University of California, Berkeley

- 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.

Graduate Researcher (2015-2017)

Paper [link]

THESIS: UNDERSTANDING THE FUNCTIONAL ORGANIZATION OF THE HUMAN CEREBELLUM

Western University

- 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.

Predicting penalty shots using markerless pose estimation

Github [link]

DEPARTMENT OF PSYCHOLOGY, UNIVERSITY OF CALIFORNIA, BERKELEY

2020

- Implemented markerless labeling of soccer players and built computer vision models to understand human performance in predicting penalty shots.

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).

Skills & Interests

Programming Languages

Python, SQL, R, MATLAB, HTML, Bash

Frameworks and Tools

Keras, Numpy, 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