

Michael Marquis

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Summary

- PhD-level neuroscientist with a strong quantitative research background and experience analyzing complex neural datasets.
- Experience with designing and implementing SQL databases, including creating a front end UI to meet the needs of team members with limited technical expertise.
- Highly proficient in data processing, statistical analysis, modeling, and visualization in MATLAB, Python (e.g. NumPy, SciPy, Pandas, Scikit-learn), and R.
- Excellent project and time management skills, and proven ability to clearly communicate research findings in both written and oral formats.
- Additional technical skills include: MS Office & VBA (Excel and Access), Git, Jupyter notebooks, image processing, distributed high-performance computing (SLURM), CAD (OnShape/Inventor), and Adobe Illustrator.

Education

Harvard University

Ph.D. in Neuroscience

Cambridge, MA

May 2021

- F31 Ruth L. Kirschstein National Resource Service Award (NRSA) fellowship recipient
National Institutes of Health

Arizona State University, Barrett Honors College

B.S. in Biological Sciences, *summa cum laude*, GPA 3.99

Tempe, AZ

May 2012

- National Merit Scholar, 2008-2012

Research experience

Harvard Medical School, Department of Neurobiology

Graduate researcher (2015-2021), Postdoctoral fellow (2021-present)

Cambridge, MA

2015-present

Advisor: Dr. Rachel I. Wilson

- Studying the computational principles underlying brain function using *in vivo* neural recordings and neural circuit modeling.
- Analysis work includes experience with time series data, large-scale circuit mapping (connectomics), linear and nonlinear regression models, image processing, and both parametric and nonparametric hypothesis testing techniques.
- Created a nonlinear regression model to understand the functional properties of dopamine neurons by predicting their activity using the animal's behavior and sensory environment.
- Used computational modeling of neural circuits to test predictions from our experimental data about the mechanisms of visual learning in the brain's navigation system.
- One first-author manuscript based on this research is currently under review (*Nature*), and a second has recently been submitted (*Current Biology*).

Harvard Medical School, Department of Neurobiology
Graduate researcher. Advisor: Dr. Till S. Hartmann

Cambridge, MA
2015

- Designed and conducted a research project studying adaptations in mammalian higher visual processing that stabilize the perceived world during eye movements.
- Included *in vivo* multi-unit extracellular recordings followed by extensive MATLAB-based analysis of the resulting data.
- Co-authored a paper based on the results of the project ([Frontiers in Systems Neuroscience 2018](#)).

Monell Chemical Senses Center
Research technician. Supervisor: Dr. Danielle Reed

Philadelphia, PA
2012-2014

- Independently designed and created SQL-based databases to improve the organization and integrity of the lab's data, facilitating analysis and freeing up a substantial amount of time for lab members to work on other tasks.
- Supported several ongoing collaborative research projects in a genetics lab studying taste sensation and perception in human and mouse models.
- Performed data analysis and generated figures for lab publications using Statistica and Graph Pad Prism software.
- Co-authored 3 publications based on my work in the lab ([Mammalian Genome 2018](#); [PLOS ONE 2017](#), [2015](#)).

Harvard University
Harvard Forest NSF-REU program undergraduate researcher
Advisor: Dr. Shannon Pelini

Petersham, MA
2011

- Designed and conducted a research project studying the effects of climate warming on ecological systems.
- Published a first-author paper based on the results in a top-ranked journal in the field ([Ecology 2014](#)).

Additional experience

Editor-in-Chief/Managing editor, Journal of Emerging Investigators 2015-Present

- Held multiple leadership roles in a volunteer-run, peer-reviewed academic journal that publishes original research conducted by middle and high school students around the world.

Teaching fellow, Neurobiology 2018

- Assisted in teaching a class intended to give Harvard medical students a broad introduction to basic principles of neuroscience and neurological disease.
- Teaching duties included leading recitation sections, working with students on problem sets, and writing exam questions.

Teaching fellow, Quantitative Methods Boot Camp Summer 2015

- Taught programming fundamentals and data analysis methods to neuroscience PhD students.