Michael Marquis

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Summary

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

Education

Harvard University — Cambridge, MA
Ph.D. in Neuroscience — May 2021
- F31 Ruth L. Kirschstein National Resource Service Award (NRSA) fellowship recipient
  National Institutes of Health

Arizona State University, Barrett Honors College — Tempe, AZ
B.S. in Biological Sciences, *summa cum laude*, GPA 3.99 — May 2012
- National Merit Scholar, 2008-2012

Research experience

Harvard Medical School, Department of Neurobiology — Cambridge, MA
Graduate researcher (2015-2021), Postdoctoral fellow (2021-present) — 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, image processing, and both parametric and nonparametric hypothesis testing techniques.
- Created a statistical 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 — Cambridge, MA
Graduate researcher. **Advisor: Dr. Till S. Hartmann** — 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 — Philadelphia, PA
Research technician. **Supervisor: Dr. Danielle Reed** — 2012-2014

- Supported several ongoing research projects in a genetics lab studying taste sensation and perception in human and mouse models.
- 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.
- 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 — Petersham, MA
Harvard Forest NSF-REU program undergraduate researcher — 2011
Advisor: Dr. Shannon Pelini

- 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.