

Michael J. Kleiman, PhD

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SKILLS AND QUALIFICATIONS

Languages: Python, R, C#, SQL

Data Science: Machine learning (*scikit-learn*, *xgboost*, *lightgbm*, *imbalanced-learn*), deep learning (*pytorch*, *tensorflow*, *keras*), feature engineering (*featuretools*, *Boruta*), hyperparameter optimization (*optuna*, *hyperopt*, *scikit-optimize*) model interpretability (*SHAP*, *LIME*, *eli5*), statistics (*statsmodels*, *pingouin*, *SPSS*, *R*, *Rstudio*), data wrangling (*pandas*, *numpy*, *SQL*), natural language processing (NLP) (*NLTK*, *speechbrain*, *spaCy*), audio processing (*pyaudio*, *pydub*), neuroimaging analysis (*freesurfer*, *pydicom*, *3DSlicer*), gaze behavior analysis (*Tobii*, *GazePoint*, *OpenSesame*, *pygaze*), visualization (*plotly*, *matplotlib*, *ggplot*, *Tableau*), Excel

Development: Git, UI design (*Qt*, *PySide*, *PyGame*, *PsychoPy*), Unity, software development, PyCharm, Visual Studio Code, Jupyter Lab, Docker

Research: Experiment design, research and literature review, scientific writing (*LaTeX*, *Word*), public speaking, teaching and presenting, virtual/online lecture production (*PowerPoint*), electronic health record systems (*EPIC*, *REDCap*), Microsoft Office

Audiovisual: Graphics design (*Adobe Photoshop*), video production (*Adobe Premiere*), audio recording and mastering (*REAPER*, *Ableton Live*, *ProTools*, *Audacity*)

Technical: Unix OS (*Ubuntu*, *Debian*, *Mint*) and Microsoft Windows tech support and troubleshooting, personal computer diagnostics and repair, command line interfacing, bash, WSL

SELECTED PUBLICATIONS

- 2022 **Kleiman, M.J.**, Chang, L., Galvin, J.E. The Brain Health Platform: Combining Resilience, Vulnerability, and Performance to Assess Brain Health and Risk of Alzheimer's Disease and Related Disorders. *Alzheimer's & Dementia*.
Kleiman, M.J., Ariko, T., Galvin, J.E. Hierarchical two-stage cost-sensitive clinical decision support system for screening prodromal Alzheimer's disease and related dementias. [10.1101/2022.09.06.22279650](https://doi.org/10.1101/2022.09.06.22279650)
- 2021 **Kleiman, M.J.**, Barenholtz, E., Galvin, J.E. Screening for early-stage Alzheimer's disease using optimized feature sets and machine learning. *Journal of Alzheimer's Disease*. [10.3233/JAD-201377](https://doi.org/10.3233/JAD-201377)
Kleiman, M.J., Galvin, J.E. The Vulnerability Index: A weighted measures of dementia and cognitive impairment risk. *Alzheimer's & Dementia: DADM*. [10.1002/dad2.12249](https://doi.org/10.1002/dad2.12249)
Galvin, J.E., **Kleiman, M.J.**, et al. The Resilience Index: A quantifiable measures of brain health and risk of cognitive impairment and dementia. *Journal of Alzheimer's Disease*. [10.3233/jad-215077](https://doi.org/10.3233/jad-215077)

- 2020 Galvin, J.E., **Kleiman, M.J.**, Walker, M. Using Optical Coherence Tomography to screen for cognitive impairment and dementia. *Journal of Alzheimer's Disease*. [10.3233/JAD-210328](https://doi.org/10.3233/JAD-210328)
- Kleiman, M.J.**, Barenholtz, E. Perception of being observed by a speaker alters gaze behavior. *Attention, Perception, and Psychophysics*. [10.3758/s13414-020-01981-9](https://doi.org/10.3758/s13414-020-01981-9)

RESEARCH EXPERIENCE

2020 - **Postdoctoral Fellow, Data Scientist**
University of Miami, Miller School of Medicine

Comprehensive Center for Brain Health

Director: James Galvin, MD MPH

- Built novel software tools for measuring cognition and cognitive impairment on desktop systems using Python and Qt5
- Analyzed medical data, investigated methods for clinical practice, and developed assessment tools using statistical and machine learning techniques
- Developed and maintained web-based dashboards on VM architecture for clinical and research applications
- Assisted in the integration of machine learning pipelines into university-wide electronic health record systems (EPIC) for clinical decision support
- Directed, recorded, and edited live and pre-recorded seminars, lectures, and advertisement media for local and international conferences, webinars, and recruitment events
- Instructed coworkers in using R and RStudio to streamline intra-office collaboration
- Collaborated with other universities and research groups to develop and implement machine learning models for clinical and academic use
- Regularly communicated technical topics to expert, non-technical, and lay audiences
- Recipient of numerous federal, state, and private grants

2016 - 2018 **Data Science Intern**

VoxelRx

- Developed deep learning models to classify Alzheimer's disease from MRI scans
- Cleaned and restructured behavioral and neuroimaging data from ADNI
- Prepared visualizations using Tableau and Python

2013 - 2019 **Graduate Researcher**

Florida Atlantic University, Department of Psychology

Machine Perception and Cognitive Robotics Lab

Advisors: Dr. Elan Barenholtz, Dr. William Hahn

- Developed paradigms for human interfacing with machines
- Utilized machine learning and neural networks to categorize clinical populations based on eye movements for multiple tasks
- Lead Researcher for *Behavioral Analytics Team*, managing up to 7 undergraduate students' projects

Visual Mind Lab

Advisor: Elan Barenholtz, PhD

- Compared eye fixation measures when modifying subjects' perceptions of real-time versus pre-recorded interactions
- Developed mechanisms for cognitive research using virtual reality systems, including multiple object tracking, attention restoration, and object saliency
- Interviewed prospective students for independent study roles

2011 - 2012 **Undergraduate Researcher**

Florida State University, Department of Biological Science

Advisor: Lisa Lyons, PhD

- Examined behavioral effects of ethanol with respect to circadian rhythms of *drosophila melanogaster*
- Independently managed fly stocks for experimental procedures
- Performed surgical removal of intestines to examine gut perfusion due to chronic ethanol administration

TEACHING & ADVISING

2019 - 2020 **Adjunct Professor**

Florida Atlantic University, Department of Psychology

Biological Bases of Behavior

- Taught undergraduate psychology and biology majors about basic principles of psychobiology, neural physiology, and neuroanatomy

Psychology of Human Development

- Taught undergraduate psychology majors about high-level biological and psychological processes involved in development throughout the lifespan

Cognition Lab

- Instructed undergraduate psychology majors on various topics in cognitive psychology and in scientific research of these topics
- Assigned and graded student presentations of proposed replication studies of classic cognition experiments

2017 - 2019 **Lead Researcher**

Machine Perception and Cognitive Robotics Lab, Behavioral Analytics Team

Mentored Projects

- Depression detection study, using a combined neural network model with capsule networks and LSTMs. 89% detection rate for self-report depressive thoughts
- Chess expert detection based on gaze patterns of chess puzzles
- Personality test prediction based on eye movement behavior towards emotionally stimulating imagery
- Drug relapse prediction based on behavioral data and demographics information

2015 - 2019 **Graduate Teaching Assistant**
Florida Atlantic University, Department of Psychology

Intermediate Statistics Laboratory – Instructor, 4 semesters

- Prepared lectures and class activities focusing on the use of SPSS statistical software to provide students with a hands-on approach to learning statistical analyses
- Created and graded course assessments, and provided continuous feedback to ensure students understood material and stayed on track

Cognition – Teaching Assistant under Dr. Elan Barenholtz, 3 semesters

- Guest lectured
- Graded homework, assignments, and quizzes, and proctored exams
- Managed class grades

Research Methods – Teaching Assistant under Dr. David Wolgin

- Instructed students on how to perform research using online methods and write an APA style research paper
- Graded and provided continuous feedback on APA style research papers

Social Behavior Laboratory – Teaching Assistant under Dr. Derrick Schlangen

- Guest lectured
- Led students in a simulated society activity
- Graded student presentations and provided feedback
- Managed class grades and attendance and proctored exams

“Michael was always willing to help me with any questions or concerns and showed a genuine interest for students to learn the material. He is a great professor.”

“Michael was a great instructor. Funny, intelligent and taught well.”

EDUCATION

2019 **Florida Atlantic University**, Boca Raton, FL
Ph.D in Experimental Psychology
M.A. in Psychology

2012 **Florida State University**, Tallahassee, FL
B.S. in Biological Science & Psychology

PROFESSIONAL MEMEBERSHIP

2022 - Member, Alzheimer’s Association
2022 - Member, McKnight Brain Institute
2021 - Member, American Academy of Neurology
2021 - Member, Psychonomic Society
2015 - Member, Vision Sciences Society

AWARDS AND HONORS

- 2022 **Alzheimer's Association Research Fellowship**
Alzheimer's Association
Grant title: *Mapping trajectories of speech metrics in preclinical Alzheimer's disease*
- 2022 **McKnight Clinical Translational Research Scholarship**
American Academy of Neurology, McKnight Brain Institute, American Brain Foundation
Grant title: *Assessing trajectories of discrete measures of speech behavior in age-related decline*
- 2020 **Postdoctoral Research Fellowship Grant**
Ed and Ethel Moore Alzheimer's Disease Research Program, Florida Department of Health
Grant title: *Development of a gaze- and speech-behavior based cognitive exam to assist in the detection of early-stage Alzheimer's disease and related disorders*

PRESENTATIONS

- 2021 **Comprehensive Center for Brain Health: Hot Topics on Healthy Brain Aging**
Talk: [*Listening to speech to understand the aging brain*](#)
University of Miami's Neurology Update and Stroke Intensive Review
Talk: [*Neurobehavioral Markers of Neurodegeneration*](#)
Palm Beach County Library System
Talk: *Dementia and Artificial Intelligence*
Institute for Learning in Retirement
Talk: [*Artificial Intelligence and the Detection of Dementia*](#)
- 2020 **Clinical Trials on Alzheimer's Disease**
Poster: [*Generation of an optimized neuropsychological feature set for the quick screening of mild cognitive impairment in clinical settings*](#)
- 2019 **Introduction to Deep Learning Bootcamp**
Talk: *Analyzing Behavior with Ensemble Networks*
Course: *Decision Trees, Random Forests, and other Ensemble Networks*
Cade Prize Innovation Competition
Pitch: *The SciKey Scan*
Coral Springs Innovate! Downtown
Pitch: *A faster and more accurate method for detecting and measuring Alzheimer's Disease*
- 2018 **Florida Blue Healthcare Innovation Competition**
Talk: *A New Way to Diagnose Depression*
Placed in 2nd Overall
FAU Wave
Poster: *Developing a Model for Mood Disorder Classification Using Eye Movements.* Conway, E., Kleiman, M.J.
Received First Place honors in competition
Vision Sciences Society
Poster: *Saliency Map Classification Using Capsule-based CNNs.* Kleiman, M.J., Hahn, W., Barenholtz, E.

Poster: *Comprehension of an audio versus an audiovisual lecture at 50% time-compression.*
Perez, N., Kleiman, M.J., Barenholtz, E.

Poster: *Attention Restoration Through Virtual Environments.* Islam, M.F., Kleiman, M.J.,
Barenholtz, E.

Osher Lifelong Learning Society

Talk: *Diagnosing Alzheimer's Disease Early: Your eye movements are the future of clinical
research*

2017

Vision Sciences Society

Poster: *You lookin' at me? Perception of a real-time dyadic interaction influences gaze behavior.*
Kleiman, M.J., Barenholtz, E.

Demo: *Virtual reality real-time multiple object tracking psychophysics platform.* Oliveira, S.,
Islam, M., Whitney, S., Kleiman, M.J., Barenholtz, E.

2016

Vision Sciences Society

Poster: *Can you see me? Eye fixations of the face are modulated by perception of a bidirectional
social interaction.* Kleiman, M.J., Barenholtz, E.