

# Michael J. Kleiman, PhD

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## EDUCATION

- 2019      **Florida Atlantic University**  
Ph.D in Experimental Psychology  
M.A. in Psychology
- 2012      **Florida State University**  
B.S. in Biological Science & Psychology

## SKILLS AND QUALIFICATIONS

- 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, PyTrack*), visualization (*plotly, matplotlib, seaborn, ggplot, Tableau*), Excel
- Development:** Python, Git, UI design (*Qt, PySide, PyGame, Kivy, PsychoPy*), VR environment production (*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, Mint*) and Microsoft Windows tech support and troubleshooting, personal computer diagnostics and repair, command line interfacing, bash, WSL

## SELECTED PUBLICATIONS

- 2021      **Kleiman, M.J.**, Galvin, J.E. The Vulnerability Index: A weighted measures of dementia and cognitive impairment risk. *Alzheimer's & Dementia: DADM*.
- 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*. [doi:10.3233/JAD-201377](https://doi.org/10.3233/JAD-201377)

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*. [doi:10.3233/jad-215077](https://doi.org/10.3233/jad-215077)

Galvin, J.E., **Kleiman, M.J.**, Walker, M. Using Optical Coherence Tomography to screen for cognitive impairment and dementia. *Journal of Alzheimer's Disease*. [doi:10.3233/JAD-210328](https://doi.org/10.3233/JAD-210328)

2020

**Kleiman, M.J.**, Barenholtz, E. Perception of being observed by a speaker alters gaze behavior. *Attention, Perception, and Psychophysics*. [doi: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
- 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
- Collaborated with other universities and research groups to develop and implement machine learning models for clinical and academic use
- Regularly communicated technical topics to non-technical and lay audiences
- Applied for federal, state, and private grant funding mechanisms

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.”*

## 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 2<sup>nd</sup> 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.