Kam Tavabi Ph.D.

RESEARCH SCIENTIST · NEUROSCIENCE EXPERT

Seattle, WA

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Summary

Creative strategist with a growth mindset and over 13 years of experience leading end-to-end biomedical data science projects in neuropsychology. Excellent reputation for problem-solving and meeting client demands. Detail-oriented and highly organized worker committed to achieving demanding research and development objectives according to tight schedules while producing high-quality data.

Work Experience

University of Washington
Seattle, WA

Research Science Engineer
2011 - 2023

- **Principle investigator** in basic autism and speech perception research in pediatric populations at the *Institute for Learning & Brain Sciences*.
- **Administered research grants resulting in $1.5M** in research funding to develop experimental paradigms to study infant language learning and behavioral impairments in autism spectrum disorders.
- Directed interdepartmental partnerships **resulting in the collection of human health data for 200+** participants in case-control and longitudinal cohorts.
- Leveraged understanding of data models and statistics to **develop PYTHON Scikit-Learn Machine Learning operations** to carry out hypothesis testing on HIPPA compliant human health data.
- Developed health **data governance, mining, visualization, and statistical modeling workflows in PYTHON**, resulting in peer-reviewed publications in scientific journals and presentations at international conferences.
- **Leveraged interpersonal and communication skills to advise junior colleagues and graduate students** on data acquisition, mining, and statistical analysis strategies to complete collaborative data science projects.
- Collaborated with distributed software development to **build and maintain PYTHON applications** for data mining, automation of extract-transform-load operations, and statistical analysis of dense-array sensor data showcased in open-source repositories: *MNEFUN*, *MNE-BIDS*, & *MNE*.

The Children's Hospital of Philadelphia
Philadelphia, PA

Post Doctoral Researcher
2008 - 2011

- **Lead scientist** at the *Lurie Family Foundations MEG Imaging Center* charged with developing neuropsychology paradigms to examine behavioral language impairments in children with autism spectrum disorders.
- **Developed a diagnostic medical imaging exam** to describe neural biomarkers for language dysfunction in 100+ school-aged children with autism enrolled in a large Federally funded data science project.
- Created a diagnostic routine that enhanced the reliability of presurgical neuroradiology exams in pediatric epilepsy patients and was **recognized by the National Institute of Health for outstanding translational biomedical research**.
- **Leveraged understanding of statistics to overhaul the analysis of dense-array timeseries dataset** and improve hypothesis testing reliability resulting in a highly-cited scientific journal publication.
- **Planned and instructed** a seminar in applied statistics to facilitate research projects for first-year medical school residents.

Education

University of Münster
Münster, Germany

Doctor of Philosophy
2004 - 2007

- Completed a dissertation on auditory neuroscience of phonological processing at *Institut für Biomagnetismus und Biosignalanalyse*.
- **Courses:** Digital Signal Processing, Electrophysiology, Neuroscience, Psycholinguistics, Neuropsychology

University of Oregon
Eugene, OR

Master of Science
2001 - 2003

- Completed a terminal M.Sc. degree in psychology with a specialization in cognition in the *Brain Development Lab*.
- **Courses:** Magnetic Resonance Imaging, Philosophy of Mind, Statistics for Data Analysis, Neurobiology of Attention & Arousal, Cognitive Psychology, Social & Personality Psychology, Developmental Psychology, Neuroplasticity, Principles of Psychology, Modern Investigation Methods in Human Neuroscience, Evolution of Mind

University of California Los Angeles

Los Angeles, CA

Bachelor of Science

1995 - 2000

- Completed a B.Sc. degree in animal physiology.
- **Courses:** Neurobiology of Learning & Memory, Biological Basis of Psychiatric Disorders, Genetics, Vertebrate Physiology, Chemistry, Organic Chemistry, Biology, Physics, Calculus, Linear Algebra, Logic

Achievements

2023	**Certificate of Completion,** *Data Science Orientation*	*USA*
2023	**Certificate of Completion,** *Certified SQL Developer*	*USA*
2022	**Certificate of Completion,** *Statistical Learning*	*USA*
2012	**Certificate of Completion,** Elekta Neuromag® MEG Advanced Program	*Helsinki, Finland*
2011	**Digital SLR Photography,** Nikon School	*USA*

Skills

Technical
Experimentation, Digital Signal Processing, Case control paradigm, Longitudinal data, Exploratory Data Analysis, Data visualization, Data mining, Statistical analysis (A/B testing, Analysis of Variance, General Linear Model), Machine Learning, Github, PYTHON, R (ggplot2, lme4, Tidyverse), HUGO HTML/CSS, SQL, MATLAB, Linux, MacOS, Windows, Shell (Bash/Zsh), LaTeX (Overleaf/R Markdown), Git.

Soft
Presentation, Time management, Teamwork, Problem solving, Documentation, Scientific writing, Grant management, Research, Mentoring.

Languages

English Native

Farsi Fluent

Spanish Conversant

Projects

Automaticity in the reading circuitry

Seattle, WA

University of Washington

2015 - 2019

- Measured brain activity in school-aged children (N = 42, 7–12 years of age) with magnetoencephalography to examine word-selective brain responses during reading.
- Developed data acquisition procedures and PYTHON routines for digital signal processing, dimensionality reduction (PCA), data transformations, and 3D statistical modeling of dense-array timeseries data.

Effectively combining temporal projection noise suppression methods in magnetoencephalography

Seattle, WA

University of Washington

2018 - 2020

- Mentored a graduate student with data visualization, analysis, and manuscript preparation for a study describing the efficacy of various noise subspace projection methods for preprocessing dense-array electrophysiology data before 3D statistical modeling.

Mne-Bids: Organizing Electrophysiological Data into the Bids Format and Facilitating Their Analysis

Seattle, WA

University of Washington

2018 - 2019

- Collaborated with an international team of software engineers to create open-source Python applications to speed up analyses, enhance code reliability, and facilitate data and code sharing amongst co-workers and collaborators.

Using magnetoencephalography to examine word recognition, lateralization, and future language skills in 14-month-old infants

Seattle, WA

University of Washington

2014 - 2019

- Investigated early childhood language learning by combining neuropsychological measurements and experimental word discrimination paradigm in a cohort of typically developing infants (N = 27, 39–42 weeks old).
- Developed data acquisition procedures and built PYTHON routines for digital signal processing, data mining, feature engineering, and regression model to assess the relationship between neuropsychological and prospective behavioral performance measurements of vocabulary growth.

Auditory Magnetic Mismatch Field Latency: A Biomarker for Language Impairment in Autism

Philadelphia, PA

The Children's Hospital of Philadelphia

2010 - 2011

- Leveraged nonparametric linear mixed modeling to overhaul statistical analysis of a large dataset containing neuropsychological measurements of speech discrimination in children diagnosed with autism spectrum disorders (N = 51, 6–15 years of age) and used receiver operator characteristic analysis to characterize diagnostic sensitivity and specificity for language impairment based on neuropsychological measurements.

Publications

Journal Articles

Using Magnetoencephalography to Examine Word Recognition, Lateralization, and Future Language Skills in 14-Month-Old Infants
Alexis N. Bosseler, Maggie Clarke, Kambiz Tavabi, Eric D. Larson, Daniel S. Hippe, Samu Taulu, Patricia K. Kuhl
Developmental Cognitive Neuroscience 47 (Feb. 2021) p. 100901. 2021

Automaticity in the Reading Circuitry
Sung Jun Joo, Kambiz Tavabi, Sendy Caffarra, Jason D. Yeatman
Brain and language 214 (Mar. 2021) p. 104906. 2021

Effectively Combining Temporal Projection Noise Suppression Methods in Magnetoencephalography
Maggie Clarke, Eric Larson, Kambiz Tavabi, Samu Taulu
Journal of Neuroscience Methods 341 (July 2020) p. 108700. 2020

MNE-BIDS: Organizing Electrophysiological Data into the BIDS Format and Facilitating Their Analysis
Stefan Appelhoff, Matthew Sanderson, Teon Brooks, Marijn van Vliet, Romain Quentin, Chris Holdgraf, Maximilien Chaumon, Ezequiel Mikulan, Kambiz Tavabi, Richard Höchenberger, Dominik Welke, Clemens Brunner, Alexander Rockhill, Eric Larson, Alexandre Gramfort, Mainak Jas
Journal of Open Source Software 4.44 (Dec. 2019) p. 1896. 2019

Auditory Magnetic Mismatch Field Latency: A Biomarker for Language Impairment in Autism
Timothy P.L. Roberts, Katelyn M. Cannon, Kambiz Tavabi, Lisa Blaskey, Sarah Y. Khan, Justin F. Monroe, Saba Qasmieh, Susan E. Levy, J. Christopher Edgar
Biological psychiatry 70.3 (Aug. 2011) pp. 263–269. 2011

Spectral–Temporal Analysis of Cortical Oscillations during Lexical Processing
Kambiz Tavabi, David Embick, Timothy P.L. Roberts
NeuroReport 22.10 (July 2011) pp. 474–478. 2011

Word Repetition Priming-Induced Oscillations in Auditory Cortex: A Magnetoencephalography Study
Kambiz Tavabi, David Embick, Timothy P.L. Roberts
NeuroReport 22.17 (Dec. 2011) pp. 887–891. 2011

Effects of Place of Articulation Changes on Auditory Neural Activity: A Magnetoencephalography Study
Kambiz Tavabi, Ludger Elling, Christian Dobel, Christo Pantev, Pienie Zwitserlood
PLoS ONE 4.2 (Feb. 2009) e4452. 2009

Auditory Evoked Fields Differentially Encode Speech Features: An MEG Investigation of the P50m and N100m Time Courses during Syllable Processing: Evoked Fields Encode Speech Features
Kambiz Tavabi, Jonas Obleser, Christian Dobel, Christo Pantev
European Journal of Neuroscience 25.10 (June 2007) pp. 3155–3162. 2007

The Growth of the Feline Brain from Fetal into Adult Life: II. A Morphometric Study of Subcortical Nuclei
Jaime R Villablanca, Troy D Schmanke, Harmony A Crutcher, Angie C Sung, Kambiz Tavabi
Developmental Brain Research 122.1 (July 2000) pp. 21–33. 2000