

Kam Tavabi Ph.D.

RESEARCH SCIENTIST · NEUROSCIENCE EXPERT

Seattle, WA.

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Summary

Experienced Research Scientist with over 13 years of experience leading end-to-end biomedical data science projects. Excellent reputation for problem solving and meeting customer demands. Detail oriented and highly organized worker with an analytical and growth mindset. Dedicated to achieving demanding research & development objectives according to tight schedules while producing high-quality data.

Work Experience

University of Washington

Seattle, WA

Research Science Engineer

2011 - 2022

- **Principle investigator** in basic autism and speech perception research in pediatric populations at ILABS.
- **Developed a series of neuropsychology paradigms** to study infant language acquisition and behavioral impairments in autism and managed research grants resulting in **\$1.5M** in research funds.
- Directed interdepartmental partnerships in engineering and collected human health data for over **200** participants in case-control and longitudinal data science projects.
- **Developed data governance, mining, visualization, and statistical analysis workflows** in **MATLAB** and **PYTHON**, resulting in **six** peer-reviewed publications in scientific journals and multiple presentations at international conferences.
- Leveraged interpersonal and communication skills to consult junior colleagues and graduate students on data acquisition, mining, and statistical analysis strategies to successfully complete collaborative data science projects.
- Collaborated with software engineers to **design and maintain PYTHON applications** for large data mining, automation, collaboration, and statistical analysis of dense-array timeseries health data, resulting in two open-source GitHub codebases: MNEFUN and MNE-BIDS.

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.
- Improved the reliability of preoperative brain mapping examinations for surgical treatment of epilepsy in pediatric patients.
- **Published research findings** in **2** peer-reviewed publications in scientific journals and **awarded** by the National Institute of Health for **outstanding translational biomedical research**.
- Overhauled the statistical analysis of dense-array timeseries dataset to use nonparametric analysis of variance method to enhance 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 IBB.
- **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

- 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 , STATSX0001: Statistical Learning	USA
2012	Certificate of Completion , Elekta Neuromag® MEG Advanced Program	Helsinki, Finland
2011	Digital SLR Photography , Nikon School	India

Skills

	Experimentation, Digital Signal Processing, Case control paradigm, Longitudinal data, Exploratory Data Analysis, Data visualization,
Technical	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	Intermediate

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
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University of Washington	2018 - 2020
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- 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
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University of Washington	2018 - 2019
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- 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