# 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.

## Education

### University of Münster

*Münster, Germany*

Doctor of Philosophy

*09/2004 - 06/2007*

- Completed a dissertation on auditory neuroscience of phonological processing in the IBB, (GPA 3.4 of 4.0).
- **Courses:** Digital Signal Processing, Electrophysiology, Neuroscience, Psycholinguistics, Neuropsychology

### University of Oregon

*Eugene, OR*

Master of Science

*09/2001 - 06/2003*

- Completed a terminal M.Sc. degree in psychology with a specialization in cognition in the Brain Development Lab, (GPA 3.3 of 4.0).
- **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

*09/1995 - 06/2000*

- 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

## Work Experience

### University of Washington

*Seattle, WA*

Research Science Engineer

*Nov 2011 - Dec 2022*

- Principle investigator in basic autism and speech perception research in pediatric populations at ILABS.
- Promoted to staff scientist in 2014 after developing a series of neuropsychology paradigms to study infant language acquisition and behavioral impairments in autism and managing 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 *Nov 2008 - Oct 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 **two** peer-reviewed publications in scientific journals and awarded **$35K** in college loan repayment 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.

## Achievements

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|---|---|---|
| 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

**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** 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*

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 sub-space 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*

- Contributed to open-source Python applications to speed up analyses, develop more reliable code, and facilitate sharing of data and code with 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 MEG to Assess the Neural Mechanisms of Phonetic Distributional Learning and Future Language Growth in 2- and 6-Month-Old Infants
Alexis Bosseler, Maggie Clarke, Kambiz Tavabi, Patricia K. Kuhl
*The Journal of the Acoustical Society of America* 150.4 (Oct. 2021) A111–A111. Acoustical Society of America; https://web.archive.org/web/20221224002527/https://asa.scitation.org/doi/10.1121/10.0007797, 2021

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

Word Recognition and Future Language Skills in 14-Month-Old Infants
Alexis Bosseler, Kambiz Tavabi, Maggie Clarke, Eric Larson, Samu Taulu, Patricia Kuhl
*The Journal of the Acoustical Society of America* 146.4 (Oct. 2019) pp. 2955–2955. Acoustical Society of America; https://web.archive.org/web/20221224002436/https://asa.scitation.org/doi/abs/10.1121/1.5137262, 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