

Moritz Boos

Data Scientist

Technical skills

Programming	Python, R, MATLAB, SQL
Machine Learning	Deep Learning, linear and nonlinear regression and classification, Natural Language Processing, audio recognition, unsupervised learning, approximate variational inference, Monte Carlo sampling
Statistics	Bayesian statistics, hierarchical Bayesian modeling, classical significance testing
Software	NumPy, SciPy, Pandas, Scikit-Learn, Pytorch, Keras, Stan

Experience

Work

- 11/2016– **Research Associate**, APPLIED NEUROCOGNITIVE PSYCHOLOGY LAB, CARL-VON-OSSIETZKY UNIVERSITY, Oldenburg, I research how Machine Learning methods can help neuroscientists understand how the brain processes speech. I employ Deep Learning, probabilistic unsupervised learning, as well as linear and non-linear regression techniques, including Ridge regression, Support Vector Machines, and Gradient Boosted Decision Trees.
- 6/2019– **Staff Associate**, NEURAL ACOUSTIC PROCESSING LAB, COLUMBIA UNIVERSITY, New York, I worked on adapting Deep Learning methods for application in auditory neuroscience, especially focusing on attention mechanisms.
- 1/2020
- 2/2015– **Contractual Work**, GEORG-AUGUST UNIVERSITY, Göttingen, Statistical analysis of questionnaire data using R.
- 11/2015
- 11/2013– **Contractual Work**, MEDICAL SCHOOL HANOVER, Hanover, Statistical analysis of EEG data using Python.
- 12/2015

Education

- 2016– **PhD student in the Applied Neurocognitive Psychology Lab**, *Carl-von-Ossietzky University*, Oldenburg.
- 2013–2017 **Masters of Science in Neurocognitive Psychology (in English)**, *Carl-von-Ossietzky University*, Oldenburg.
- 2009–2013 **Bachelor of Science in Psychology**, *Technische Universität Carolo-Wilhelmina*, Braunschweig.

Selected Internships

- 7/2016– **Internship**, INRIA SACLAY, Saclay, I used Natural Language Processing to build
10/2016 predictive models of brain activity elicited by speech..
5/2015– **Internship**, OTTO-VON-GUERICKE UNIVERSITY, Magdeburg, I worked on the
8/2015 validation of analysis pipelines which employ high-dimensional regression in
neuroimaging..

Machine Learning competitions

- 2015 **How much did it rain? II**, *Predict hourly rainfall using data from polarimetric radars*, Place 72/587, Top 13%.
2018 **Toxic Comment classification challenge**, *Identify and classify toxic online comments*, Place 119/4551, Top 3%.

Open source contributions

- Nilearn A machine learning library for neuroimaging
Datalad-OSF A Datalad extension for the Open Science Framework

Attended Hackathons

- 2/2016 and **Brainhack**, *Paris*, Collaborative development of open source software for
3/2017 neuroscience.
5/2018 **Brainhack**, *Magdeburg*, Collaborative development of open source software for
neuroscience.
2/2019 **Brainhack**, *Warsaw*, Collaborative development of open source software for
neuroscience.
11/2019 **Brainhack**, *New York City*, Collaborative development of open source software for
neuroscience.

Selected Publications

Moritz Boos et al. "Probabilistic inference: Task dependency and individual differences of probability weighting revealed by hierarchical Bayesian modelling". In: *Frontiers in Psychology* 7 (2016), p. 755.

Moritz Boos et al. "The role of auxiliary parameters in evaluating voxel-wise encoding models for 3T and 7T BOLD fMRI data". In: *bioRxiv* (2020). DOI: 10.1101/2020.04.07.029397. URL: <https://www.biorxiv.org/content/early/2020/04/09/2020.04.07.029397>.

Caroline Seer et al. "Prior probabilities modulate cortical surprise responses: A study of event-related potentials". In: *Brain and cognition* 106 (2016), pp. 78–89.