

Kristijan Armeni

ASSISTANT RESEARCH SCIENTIST, COGNITIVE NEUROSCIENTIST

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Summary

Research scientist with 7+ years of experience working in international academic teams specializing in *human neuroscience* (MEG, EEG) and *text analysis* • 6+ years of experience leveraging *artificial neural networks* and *machine learning* • I take big-picture questions and translate them into robust analysis pipelines • I produce concise data visualizations that take into account uncertainty • Passionate about open and reproducible science

Skills

Scientific Computing Python scientific stack, PyTorch, Scikit-Learn, Jupyter, MATLAB, Git/GitHub, bash, \LaTeX
MLOps High-performance computing (slurm), experiment tracking (DVC), continuous integration (CircleCI)
Languages Slovenian (first language), English (fluent), French (fluent)

Work Experience

Department of Psychological and Brain Sciences, Johns Hopkins University

Baltimore, United States

ASSISTANT RESEARCH SCIENTIST

Feb. 2024 - ongoing

- data curation and building encoding models of intracranial (stereotactic) EEG
- analysis of internal representations of language models (AI interpretability)
- contributing to MNE-Python, open-source Python package for analysis of neurophysiological (EEG, MEG) data ([example contribution](#), [GitHub](#))
- graduate student mentoring and supervision

Department of Psychological and Brain Sciences, Johns Hopkins University

Baltimore, United States

POSTDOCTORAL FELLOW

Oct. 2020 - Jan 2024

- implementing signal processing and machine learning pipelines for analysis of human brain electrical activity data (Python, MATLAB)
- created pipelines for deep neural network (LSTM, transformers) training and analyses (PyTorch); [example code](#) ([GitHub](#))
- writing and editing of research reports (e.g. <https://arxiv.org/abs/2210.13569>); presented research findings at international meetings (e.g. [NeurIPS2022](#) ([Youtube](#)))

Department of Knowledge Technologies, Jozef Stefan Institute

Ljubljana, Slovenia

VISITING RESEARCHER

July. 2022

- developed a pipeline testing working memory of language models across training and scale (14M to 12B parameters)

Donders Institute for Brain, Cognition and Behaviour

Nijmegen, The Netherlands

PHD CANDIDATE

Sep. 2016 - Sep. 2020

- built and deployed neural data analyses pipelines using the FieldTrip toolbox (MATLAB); [example code](#) ([GitHub](#))
- designed, and curated two large-scale datasets of brain electrical activity during story listening (> 100 GB data per set); [Data paper](#) ([DOI](#))
- organized and chaired monthly interdisciplinary seminar (25+ events) on AI, cognitive neuroscience, and philosophy: [Foundations of Cognition Series](#)

Prevajanje, Kristijan Armeni, s.p.

Ljubljana, Slovenia

TRANSLATOR AND EDITOR (SOLE-OWNERSHIP)

2015 - 2017

- Translated medical texts and academic articles (Slovene to English) for clients in academia and healthcare industry; example work: Varela et al, The Embodied Mind (book translation) ([ISBN 978-961-260-111-9](#)), Medical Ethics in Clinical Practice, Springer Nature. [DOI](#)

Education

Donders Graduate School for Cognitive Neuroscience, Radboud University

Nijmegen, The Netherlands

PHD

2016 - 2021

disseration: [On model-based neurobiology of language comprehension: Neural oscillations, processing memory, and prediction.](#)

Donders Graduate School for Cognitive Neuroscience, Radboud University

Nijmegen, The Netherlands

MSC IN COGNITIVE NEUROSCIENCE

2014 - 2016

thesis: [Using probabilistic language models for tracking modulations in MEG spectral power during auditory narrative comprehension.](#)

Faculty of Arts, University of Ljubljana

Ljubljana, Slovenia

MA IN TRANSLATION STUDIES

2011 - 2014

thesis: [Eye-tracking measures as indicators of readability in machine-translated texts.](#)

Publications

- **Armeni K**, Honey C, Linzen T. Characterizing Verbatim Short-Term Memory in Neural Language Models. 2022. Accepted at Conference on Computational Natural Language Learning 2022. <https://doi.org/10.48550/arXiv.2210.13569>
- Heilbron M, **Armeni K**, Schoffelen JM, Hagoort P, de Lange F. 2022. A hierarchy of linguistic predictions during natural language comprehension. Proceedings of the National Academy of Sciences. <https://doi.org/10.1073/pnas.2201968119>
- **Armeni K**, Güçlü U, Van Gerven M, Schoffelen JM. 2022. A 10-hour within-participant magnetoencephalography narrative dataset to test models of language comprehension. Scientific Data. <https://doi.org/10.1038/s41597-022-01382-7>
- Armeni, K, Brinkman L, Carlsson L, ..., Zurita-Milla R. 2021. Towards wide-scale adoption of open science practices: The role of open science communities. Science and Public Policy. 48(5), 2021, 605–611. <https://doi.org/10.1093/scipol/scab039>
- **Armeni, K**, RM Willems, A van den Bosch, and JM Schoffelen. 2019. Frequency-specific brain dynamics related to prediction during language comprehension. NeuroImage 198, 283–295. <https://doi.org/10.1016/j.neuroimage.2019.04.083>
- **Armeni, K**, RM Willems, and SL Frank Dec. 2017. Probabilistic language models in cognitive neuroscience: Promises and pitfalls. Neuroscience & Biobehavioral Reviews 83, 579–588. <https://doi.org/10.1016/j.neubiorev.2017.09.001>

Presentations

- **Armeni K**, Honey C, Linzen T. Characterizing Verbatim Short-Term Memory in Neural Language Models. December 2022. [Memory in Artificial and Real Intelligence. NeurIPS2022 Workshop.](#)
- **Armeni K**, Honey K, Linzen T. August 2022. [A contextual encoding model for human ECoG responses to a spoken narrative.](#) Conference on Cognitive Computational Neuroscience 2022.
- Armeni K, October 2021. Meta-research paves the way, open science communities walk the walk. Stanford METRICS Seminar. Recording: <https://vimeo.com/630219778>
- Armeni, K, November 2019. Collaborative version control with Git and GitHub. International Max Planck Research School. Recording: <https://vimeo.com/688652849>

Mentoring

ongoing **Gio Li**, Decoding models of intracranial EEG

JHU

2022 **Gabriel Kressin Palacios**, Working Memory for Sentences in Transformer Language Models (BSc)

JHU, FU Berlin

Honors & Awards

2022 **Grant**, Working-memory based assessment of large language models

Slovenia, U.S.A

2016 **Finalist**, Donders Institute Top Talent Research Grant

The Netherlands

2016 **Finalist**, International Max-Planck Research School Fellowship

The Netherlands

2014 **Award**, Prešern Faculty Award for outstanding MA thesis

Slovenia

Volunteering and Service

VTIS Data Science Group (Association of Slovenians Educated Abroad)

virtual

LEADER | <https://www.drustvoVTIS.si/>

Feb. 2022 - Jan 2024

- organizing virtual monthly data science meetups and events for a community of 80 members

National Open Science Festival

The Netherlands

PROGRAM COMMITTEE MEMBER | <https://opensciencefestival.nl>

2020

- selected program contributions for the inaugural edition of the festival

eSinapsa – online magazine of the Slovenian Neuroscience Association

Ljubljana, Slovenia

EDITOR | <https://www.sinapsa.org/esinapsa>

Sep. 2016 - ongoing

- editorial decisions on submitted articles (1-2/month)

Open Science Community Nijmegen

Nijmegen, the Netherlands

CO-FOUNDER | www.openscience-nijmegen.nl

Jan. 2019 - Aug. 2020

- a community devoted to developing scientific practices that ensure transparency and reproducibility of research work
- lead monthly organizing committee meetings (5-10 members), edited monthly cross-faculty newsletter (200+ subscribers)