

Kristijan Armeni

ASSISTANT RESEARCH SCIENTIST, COGNITIVE NEUROSCIENTIST

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Summary

Researcher with 6+ years of experience working in international academic teams specializing in *neuroscience and language* • 5+ years of experience leveraging *artificial neural networks and machine learning* • Passionate about open science and working open • I thrive in (com)passion-driven collaborative teams

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)
- 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)

LEADER | [HTTPS://WWW.DRUSTVOVTIS.SI/](https://www.drustvovtis.si/)

virtual
Feb. 2022 - Jan 2024

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

National Open Science Festival

PROGRAM COMMITTEE MEMBER | [HTTPS://OPENSOURCEFESTIVAL.NL](https://opensciencefestival.nl)

The Netherlands
2020

- selected program contributions for the inaugural edition of the festival

eSinapsa – online magazine of the Slovenian Neuroscience Association

EDITOR | [HTTPS://WWW.SINAPSA.ORG/ESINAPSA](https://www.sinapsa.org/esinapsa)

Ljubljana, Slovenia
Sep. 2016 - ongoing

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

Open Science Community Nijmegen

CO-FOUNDER | [WWW.OPENSOURCE-NIJMEGEN.NL](http://www.openscience-nijmegen.nl)

Nijmegen, the Netherlands
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)

Skills

Scientific Computing

Python scientific stack, PyTorch, Scikit-Learn, MATLAB, Git/GitHub, bash, 𐌆𐌶𐌵

MLOps

High-performance computing (slurm), experiment tracking (DVC), continuous integration (CircleCI)

Languages

Slovenian (first language), English (fluent), French (fluent)