**Pieter Barkema**

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**EDUCATION**

5/2023 – 5/2026 **Doctorate of Philosophy (PhD) in Cognitive Neuroscience (fully funded)**

**Queen’s Institute of Neurology, University College London (London, UK)**

Relevant coursework: Unsupervised Learning, Approximate Inference, Bayesian Statistics, Machine Vision.

* Developed, managed and publishing two high-precision human brain scanning studies to measure (7T fMRI, MEG) how brain areas compute conscious perception from sensory information and bias.
* I preprocessed, standardized, modelled, applied time series analysis to high-dimensional (106) and high temporal resolution (millisecond) noisy brain data (MATLAB).
* Used Probabilistic Modelling to infer how the brain learns statistical uncertainty (pymc3, Python).

9/2020 – 8/2021 **MSc Cognitive Neuroscience (First Class Honours)**

**King’s College London (London, UK)**

*Course content: neuroimaging, machine learning and cognitive neuroscience.*

Thesis: developed linear algebra method for analyzing time series brain data and found evidence that the brain uses meta-learning to learn object recognition through biased geometry of noise.

9/2016 – 8/2019 **BSc Artificial Intelligence (Upper Second Class Honours)**

**Utrecht University (Utrecht, Netherlands)**

Relevant coursework: Machine Learning, Statistics, Programming (C#, Python, Prolog).

# PROGRAMMING LANGUAGES & SOFTWARE

Proficient: Python (PyTorch, pymc3), C#, R, Matlab, Flask, Bash, GitHub, Docker, gunicorn.

# PROFESSIONAL EXPERIENCE

1/2022 – 8/2023**Scientific Programmer** (full time, paid position)

Donders Center for Cognitive Neuroimaging, Nijmegen, The Netherlands

*Roles and Responsibilities*:

• Developed frontend (Flash, React.js) and backend (Docker, gunicorn) for online machine learning app for comparing user brain data to ten thousands of brains: https://pcnportal.dccn.nl/.   
• Integrated the app with parallel computing cluster (Bash) and toolkit for Hierarchical Bayesian Modelling (Python) to compute individual deviation scores.  
• Made highly complex and expensive computational brain analysis available for free in one click.  
• ~1K unique visitors, 75 active users, 10 validated models and led to five published studies.

10/2019 – 8/2020 **Associate Linguist** (full-time, paid position)

Google & Lionbridge, London, United Kingdom

• Build, trained and evaluated Large Language Models (LLMs) used by millions.  
• Solved >100 bugs.

1/2018 – 7/2018 **Research Intern** (part-time, unpaid position)

Psychiatry Department, University Medical Center, Utrecht, Netherlands

• Wrote code (Python) to analyse patient speech with LLMs (word2vec) & unsupervised clustering.  
• Contributed to peer-reviewed study on automated psychiatry diagnosis (de Boer et al., 2018).

Spring 2018 & 2019 **Teacher’s Assistant** (part-time, paid position)

Department of Computational Linguistics, Utrecht University, Utrecht, Netherlands.

• Taught two semesters of NLP Machine Learning from pre-processing to language recognition.

# FUNDING, AWARDS AND ACHIEVEMENTS

6/2024 **Guarantor of Brain Travel award** (£962.00 GBP)

5/2023 – 5/2026 **Additional secured Travel Funding from European Research Council (**£5000**)**

5/2023 – 5/2026 **Three-year full doctoral research funding by European Research Council** (£90,000.00 GBP)

9/2018 – 2/2019**First place and new high score in AI team competition** **at Tsinghua University (Tensent)**

9/2018 – 2/2019**Awarded one of four places for university exchange with Tsinghua University (China)**

9/2015 – 5/2016 **Fulbright Scholarship program**($26,750.00 USD) at Wittenberg University (USA)

# LEADERSHIP AND COMMUNITY ENGAGEMENT

**Research Project Management - 5/2023 – 5/2026**

Lead two brain studies where I managed three people, oversaw communication with 300 participants and was responsible for efficient use of £400.000 of human and technological resources.

**Bayesian Study Group – 5/2025 – 10/2025**

Initiated a Study Group of fifteen scientists from PhD to Professor to learn complex Bayesian Inference (pym3, R, Python) with a practical and theoretical session every week, leading to proficiency in these skills.

**Brain Meeting – 9/2025 – 6/2026**

Co-organized an international seminar series hosting leading experts from across the world and moderated their talks.

**Royal Institution Family Lecture – 9/2025**

I developed a paid 60-minute talk for the prestigious Royal Institution (1.5M subscribers on YouTube). I presented a family-friendly and demo-rich talk on how the brain creates our reality and how we compare to artificial intelligence.

**Academic Committee – 9/2024 – 9/2025**

Part of organizing committee to host high profile leaders at Goodenough College. I interviewed, for example, Nobel Prize laureate Sir Paul Nurse, Chief Scientist Dame Angela McLean, and President of Royal Society Sir Adrian Smith.

**Volunteer work –** **DataKind - 11/2020**

I joined a team of professional Data Scientists to analyze seventy years of data for the non-profit organization, St. John’s Ambulance (largest first aid charity in UK), providing insights to increase volunteering with 20%.

**Supervisor for In2Research program – 3/2024 – 7/2024**

Supervised a high-achieving student from underprivileged background for the In2Research program, providing mentorship to help bridge the opportunity gap in academia.

# PUBLICATIONS AND CONTRIBUTIONS TO THE LITERATURE

**Barkema, P.,** Koenig, C., Haarsma, J. & Kok, P. (2025). Deep layers of primary visual cortex encode postdictive perception. Conference Talk. Visual Science Society Meetup, May 2025, Florida, USA.

**Barkema, P.,** Rutherford, S., Lee, H. C., Beckmann, C., & Marquand, A. (2024). Scalable and accessible normative modelling for cross-cultural generalizability in neuropsychiatry. Conference Poster. Organization for Human Brain Mapping Meetup, June 2024, Seoul, South Korea.

**Barkema, P.**,Rutherford, S., Lee, H. C., Kia, S. M., Savage, H., Beckmann, C., & Marquand, A. (2023). Predictive Clinical Neuroscience Portal (PCNportal): instant online access to research-grade normative models for clinical neuroscientists. Wellcome open research, 8.

Rutherford, S., **Barkema, P.**, Tso, I. F., Sripada, C., Beckmann, C. F., Ruhe, H. G., & Marquand, A. F. (2023). Evidence for embracing normative modeling. Elife, 12, e85082.

Augustijn A. A. de Boer, Johanna M. M. Bayer, Seyed Mostafa Kia, Saige Rutherford, Mariam Zabihi, Charlotte Fraza, **Pieter Barkema**, Lars T. Westlye, Ole A. Andreassen, Max Hinne, Christian F. Beckmann, Andre Marquand; Non-Gaussian normative modelling with hierarchical Bayesian regression. Imaging Neuroscience 2024; 2 1–36. doi: <https://doi.org/10.1162/imag_a_00132>