Curriculum Vitae

Victoria Laura Bosch

Current Position:	**Ph.D. student | Cognitive Computational Neuroscience** Kietzmann Lab, Machine Learning Group Institute for Cognitive Science, University of Osnabrück, Germany
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Education

Nov 2022 – Current:	Ph.D. student at the University of Osnabrück. Advisor: Prof. Dr. Tim C Kietzmann Funded by ERC project 'It's about time: Towards a dynamic account of natural vision'.
Sep 2020 – Jul 2022:	MSc. in Cognitive Computing (Artificial Intelligence). *Cum laude*. Radboud University (Donders Institute). Thesis: '*Topographic Neural Networks show neural recycling of labile units during reading acquisition*'.
Sep 2016 – Jul 2020:	BSc. in Liberal Arts & Sciences (i.e., interdisciplinary research). Major in Artificial Intelligence and minor in Philosophy. University of Utrecht. Thesis: '*A Bayesian perspective on the interaction between numerical and temporal perception*'.

Other education

Sept 2023:	Participation in the Analytical Connectionism Summer School at the Gatsby Computational Neuroscience Unit, UCL, London.

Positions

2021- 2022:	Member of the Degree Programme Committe (master student representative) of the Artificial Intelligence programme, Radboud University.
2019-2021:	Editor in-Chief and Board Member at De Focus, Student platform for science communication and outreach.

Publications

Publications in peer-reviewed scientific journals

Lu, Z.†, Doerig, A.†, **Bosch, V.†,** Krahmer, B., Kaiser, D., Cichy, R. M., & Kietzmann, T. C. (2025). End-to-end topographic networks as models of cortical map formation and human visual behaviour. *Nature Human Behaviour*, 1-17.
Open access link: https://doi.org/10.1038/s41562-025-02220-7

Bosch V. and Mecacci G. (2023) Eyes on the road: brain computer interfaces and cognitive distraction in traffic. *Front. Neuroergon.* 4:1171910. doi: 10.3389/fnrgo.2023.1171910

Preprints

Ventura, L.A.†, **Bosch, V.†,** Kietzmann, T.C., Thorat, S (2026). A Minimal Task Reveals Emergent Path Integration and Object-Location Binding in a Predictive Sequence Model. *Arxiv https://arxiv.org/abs/2602.03490*

Bosch, V., Anthes, D., Doerig, A., Thorat, S., König, P., Kietzmann, T.C. (2025). Brain-language fusion enables interactive neural readout and in-silico experimentation. *Arxiv https://arxiv.org/pdf/2509.23941 Under review.*

Lu, Z.†, Doerig, A.†, **Bosch, V.†**, Krahmer, B., Kaiser, D., Cichy, R., Kietzmann, T.C. (2023). End-to-end topographic networks as models of cortical map formation and human visual behaviour: moving beyond convolutions. *Arxiv*. https://arxiv.org/abs/2308.09431

Peer-reviewed conference proceedings

Bosch, V., Anthes, D., Doerig, A., Thorat, S., König, P., Kietzmann, T.C. (2025). CorText-AMA: brain-language fusion as a new tool for probing visually evoked brain responses. *Computational Cognitive Neuroscience (CCN).*

Bosch, V., Gütlin, D., Doerig, A., Anthes, D., Thorat, S., König, P., Kietzmann, T.C. (2024). CorText: large language models for cross-modal transformations from visually evoked brain responses to text captions. *Computational Cognitive Neuroscience (CCN).*

Lu, Z.†, Doerig, **Bosch, V.†**, A.†, Krahmer, B., Kaiser, D., Cichy, R., Kietzmann, T.C. (2023). The brain can't copy-paste: End-to-end topographic neural networks as a way forward for modelling cortical map formation and behaviour. *Computational Cognitive Neuroscience (CCN).*

Bosch V.†, Diehl A.†, Smits D.†, Toeter A.† and Kwisthout J. (2021). Implementation of a Distributed Minimum Dominating Set Approximation Algorithm in a Spiking Neural Network. *BNAIC/BeneLearn*.

Conference contributions

Talks

Implementation of a Distributed Minimum Dominating Set Approximation Algorithm in a Spiking Neural Network. **V. Bosch**, A. Diehl, D. Smits, A. Toeter and J. Kwisthout. BNAIC/BeneLearn 2021, Luxembourg.

Posters

Bosch, V., Gütlin, D., Doerig, A., Anthes, D., Thorat, S., König, P., Kietzmann, T.C. (2025). CorText: large language models for cross-modal transformations from visually evoked brain responses to text captions. *NEAT: NeuroAI Talks conference, Osnabrück.*

Bosch, V., Gütlin, D., Doerig, A., Anthes, D., Thorat, S., König, P., Kietzmann, T.C. (2024). CorText: large language models for cross-modal transformations from visually evoked brain responses to text captions. *Computational Cognitive Neuroscience (CCN), Boston.*

Lu, Z.†, Doerig, A.†, **Bosch, V.**†, Krahmer, B., Kaiser, D., Cichy, R., Kietzmann, T.C. (2023). The brain can't copy-paste: End-to-end topographic neural networks as a way forward for modelling cortical map formation and behaviour. *Computational Cognitive Neuroscience Conference, Oxford.*

Lu, Z.†, Doerig, A.†, **Bosch, V.**†, Krahmer, B., Kaiser, D., Cichy, R., Kietzmann, T.C. (2023). The brain can't copy-paste: End-to-end topographic neural networks as a way forward for modelling cortical map formation and behaviour. *Analytical Connectionism Summer School, Gatsby Unit UCL London.*

Lu, Z.†, Doerig, A.†, **Bosch, V.**†, Krahmer, B., Kaiser, D., Cichy, R., Kietzmann, T.C. (2023). The brain can't copy-paste: End-to-end topographic neural networks as a way forward for modelling cortical map formation and behaviour. *NEAT: NeuroAI Talks conference, Osnabrück.*

Lu, Z.†, Doerig, A.†, **Bosch, V.**†, Krahmer, B., Kaiser, D., Cichy, R., Kietzmann, T.C. (2023). The brain can't copy-paste: End-to-end topographic neural networks as a way forward for modelling cortical map formation and behaviour. *The Interdisciplinary Computational Cognition Conference (ComCo), Osnabrück.*

Emergence of topographic organization in a non-convolutional deep neural network. Doerig, A., Krahmer, B., **Bosch, V.**, & Kietzmann, T.C., NVP Winter Conference on Brain and Cognition, 2021

† Equal contributions

Invited scientific talks

Invited talk at the Brain & Cognition seminar (Prof. op de Beeck), KU Leuven, 2026. *Brain-language fusion enables interactive neural readout and in-silico experimentation.*

Invited talk at the Department of Analytic Philosophy (Prof. Tomáš Marvan), Czech Academy of Science, 2025. *Brain-language fusion enables interactive neural readout and in-silico experimentation.*

Invited talk at the Visual Inference Lab (Prof. Nikolaus Kriegeskorte), Columbia University, 2025. *Brain-language fusion enables interactive neural readout and in-silico experimentation.*

Invited talk at the Automated Scientific Discovery of Mind and Brain Workshop, Princeton University, 2025. *Brain-language fusion enables interactive neural readout and in-silico experimentation.* (link)

Invited talk at the Computational Neuroscience research group of Prof. Thomas Naselaris, University of Minnesota, 2025. *Brain-language fusion enables interactive neural readout and in-silico experimentation.*

Invited talk at the Predictive Processing Lab, Donders Institute, 2024. *CorText: large language models for cross-modal transformations from visually evoked brain responses to text captions.*

Outreach

Bosch, V., *Het voorspellende brein: perceptie als hypotheses over de werkelijkheid* (2021). Popular science article about predictive processing at De Focus.

Teaching

Teaching assistant:

2025: *Projects at the intersection of neuroscience and machine learning* (advanced bachelors, masters), University of Osnabrück. (three projects: decoding scene graphs from ANN embeddings, analysing gaze behaviour with scene graphs, temporal straightening in MEG, and designing topographic neural networks with trainable Mexican hat tuning.

2025: *Projects at the intersection of neuroscience and machine learning* (advanced bachelors, masters), University of Osnabrück. (three projects: gaze-informed object co-occurrence embeddings to predict neural data, mechanistic interpretability for multimodal brain-to-text transformer, and using sparse autoencoders to decode from MEG data).

2024: *Projects at the intersection of neuroscience and machine learning* (advanced bachelors, masters), University of Osnabrück. (two projects: path integration in ANNs and the emergence of grid cells).

2023: *Machine Learning for Cognitive Computational Neuroscience* (advanced bachelors, masters), University of Osnabrück.

2022: *Cognitive Computational Neuroscience* (advanced bachelors), Radboud University, Nijmegen.

Supervision:

Thesis supervisor for bachelor and master's students at the University of Osnabrück.

Emilly Sidaine-Daumiller (BSc., 2023-2024) – Question-answering with neural data
Stefan Balle (MSc., 2023-2024) – Bihemispheric neural networks
Sabine Scholle (BSc., 2023-2024), co-supervision with Daniel Anthes. – Functional alignment with autoencoders.
Tara Schuchort (BSc., 2024-2025) – Question-answering with neural data
Linda Ariel Ventura (BSc., 2025), co-supervision with Dr. Sushrut Thorat. – Relational

representations via glimpse prediction.
Henning Stegemann (MSc., 2025) – Encoding models of visually evoked neural responses
Benjamin Fricke (BSc., 2025) – Understanding brain-LLM alignment using SAEs.

Reviewing

Cognitive Computational Neuroscience

Cognitive Computational Neuroscience Proceedings

PLOS Computational Biology

Scientific Reports

ICML 2025 World Models

Organisation

NeuroAI Talks (NEAT) at the University of Osnabrück (2024).

NeuroAI Talks (NEAT) at the University of Osnabrück (2023).

Performing Robots Conference (2019, Panel Assistant).

Technical skills

Areas of expertise: Cognitive computational neuroscience, machine learning, deep learning, large language and multimodal transformer models, interdisciplinary research, analytic philosophy.

Programming languages: Fluent in Python. Experience with R, C#, Netlogo, Javascript, HTML and Solidity.

Deep learning frameworks: PyTorch, TensorFlow, HuggingFace.

Data analysis and tools: SciPy, NumPy, Scikit-Learn, Git and LaTeX software. Experienced with a wide range of data analysis methods for neuroscience and machine learning. Experience with High Performance Computing, SLURM.

Languages: Dutch (mother tongue), English (native), German (basic), French (beginner).