Patricia Rubisch

General Information

Affiliation *Institute for Neuroscience and Biopsychology for Clinical Application, Medical School Berlin*

Supervisor Dr. Melanie Stefan

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Education

2019–2024 **PhD**, *ANC: Machine Learning, Computational Neuroscience, Computational Biology*, University of Edinburgh, UK, Thesis title: The interplay between voltage-dependent plasticity, inhibition and network structure in spiking neuronal network models.

2018–2019 **MScR**, *ANC: Machine Learning, Computational Neuroscience, Computational Biology* , University of Edinburgh, UK, Master of Science by Research with Distinction.

2015 – 2018 **BSc Cognitive Science**, Eberhard Karls Universität Tübingen, Germany.

Publications

- Geirhos, R., **Rubisch, P.**, Rauber, J., Temme, C. R. M., Michaelis, C., Brendel, W., & Wichmann, F. A. *Inducing a human-like shape bias leads to emergent human-level distortion robustness in CNNs*. In Journal of Vision, 19. 2019
- Otte, S., **Rubisch, P.**, & Butz, M. V. *Gradient-based learning of compositional dynamics with modular RNNs*. In International Conference on Artificial Neural Networks, 2019

Preprints

- **Rubisch, P.**, Stefan, M. I., Hennig, M. H. *The role of temporal sensitivity of synaptic plasticity in representation learning*. bioRxiv. 2024
- Haghiri, S., **Rubisch, P.**, Geirhos, R., Wichmann, F., von Luxburg, U. *Comparison-based framework for psychophysics: Lab versus crowdsourcing*. arXiv. 2019
- Geirhos, R., **Rubisch, P.**, Michaelis, C., Bethge, M., Wichmann, F. A., & Brendel, W. *ImageNet-trained CNNs are biased towards texture; increasing shape bias improves accuracy and robustness*. arXiv. 2018. Published as a conference paper at ICLR 2019

Talks

- **Rubisch, P.**, Hennig, M., *Inhibitory control of plasticity promotes stability and competitive learning in recurrent networks*, Gordon Research Seminar: Inhibition in the CNS 2023, Les Diablerets, Switzerland

Poster Presentations

- **Rubisch, P.**, Hennig, M., *Competitive learning through fast inhibitory regulation of neural plasticity*, presented at CoSyNe 2024, Lisbon, Portugal
- **Rubisch, P.**, Hennig, M., *Inhibitory control of plasticity promotes stability and competitive learning in recurrent networks*, presented at CoSyNe 2023, Montreal, Canada

- **Rubisch, P.**, Hennig, M., *Sensitivity to subthreshold fluctuations in membrane potential is central for prediction of synaptic plasticity*, presented at Bernstein Conference 2022, Berlin, Germany
- **Rubisch, P.**, Hennig, M., *Lateral inhibition regulates Long Term Plasticity and functional specialisation*, presented at SPONT 2022, Alicante, Spain
- **Rubisch, P.**, Hennig, M., *Systematic exploration of neuron type differences in standard plasticity protocols employing a novel pathway-based plasticity rule*, presented at Bernstein Conference 2021, online
- **Rubisch, P.**, Hennig, M., *Systematic exploration of neuron type differences in standard plasticity protocols employing a novel pathway-based plasticity rule*, short talk at Neuromatch Conference 4 2021, online

Grants, Awards and Fellowships

07/2024 **LSA Fellow**, German Scholar Organisation, Germany

03/2023 **CoSyNe Presenter Travel Grant**, CoSyNe 2023 in Montreal, Canada

Work Experience

12/2023–Present **Postdoctoral Researcher**, Medical School Berlin, Stefan Lab.
Modelling synaptic plasticity in health and disease from molecules to networks

07/2024 **Teaching Assistant**, Neuromatch Academy, online.
Teaching Assistant for 2 week *NeuroAI* course

2019–2023 **Teaching Assistant**, University of Edinburgh, Scotland.
Teaching Assistant for *Computational Cognitive Neuroscience*, Marker for *Neural Computation* and Tutor, Demonstrator and Marker for INF1:CG (cognitive science undergraduate course)

2015–2018 **Student Research Assistant**, Eberhard Karls Universität Tübingen, AG Neural Information Processing, Prof. Felix Wichmann.
Planning, implementation and conduction of psycho-physical experiments

Additional Education

2022 **Cajal Advanced Neuroscience Training Programme**: Computational Neuroscience

2022 **FENS Summer School**: Artificial and natural computations for sensory perception: what is the link?

2020 **Neuromatch Academy**: Computational Neuroscience

Service and Leadership

2025 – today Postdoc Representative of the Bernstein Network

2024 – today INBICA Journal Club organiser

2016 –2018 Student representative *Study Commission Cognitive Science*

2016 – 2018 Student representative *Board of Examiners Cognitive Science*

Programming Languages

Languages Python, Matlab, Java, R, Scheme