Marcel Binz

Max-Planck-Ring 8, 72076 Tübingen, Germany

marcel.binz@tue.mpg.de marcelbinz.github.io marcelbinz (+49) 15203605574

Research Interests

Cognitive Science; Machine Learning; Meta-Learning; Resource Rationality; Reinforcement Learning; Deep Learning; Bayesian Inference; Information Theory; Decision-Making; Large Language Models

Current Position

Max Planck Institute for Biological Cybernetics, PI: Dr. Eric Schulz **2021 - present**
Postdoctoral researcher

Education

Philipps-Universität Marburg, PI: Prof. Dominik Endres **2018 - 2021**
Dr. rer. nat. (Psychology)

KTH Royal Institute of Technology, Stockholm **2015 - 2018**
M.Sc. (Machine Learning)

Eberhard Karls Universität Tübingen **2012 - 2015**
B.Sc. (Cognitive Science)

Experience

Harvard University, PI: Prof. Samuel Gershman **09/2019 - 12/2019**
Research visit

Facebook Inc. **06/2016 - 12/2016**
Research internship

Eberhard Karls Universität Tübingen, PI: Prof. Martin Butz **04/2015 - 08/2015**
Research assistant

Awards

German Cognitive Science Society Best Publication Award **2020 - 2022**
Best publication in cognitive science by a young investigator

EuroCogSci 2019 Best Poster Award **2019**
Best poster presentation

DMV-Abiturpreis **2010**
Excellent performance in high school mathematics

Grants

German Academic Exchange Service (DAAD) Scholarship **2019**
Funding for a three month research visit at Harvard University

Summer Institute on Bounded Rationality **2019**
Funding for travel and accommodation

Publications

This list only contains archival publications. Please check my google scholar profile for an exhaustive list of preprints, abstracts, extended abstracts, and non-archival conference publications.

Schulze Buschoff, L. M. , Schulz, E. and **Binz, M.**, 2023. The Acquisition of Physical Knowledge in Generative Neural Networks. *Fortieth International Conference on Machine Learning (ICML 2023)*.

Binz, M. and Schulz, E., 2023. Using cognitive psychology to understand GPT-3. *Proceedings of the National Academy of Sciences*.

Binz, M. and Schulz, E., 2022. Reconstructing the Einstellung Effect. *Computational Brain & Behavior*.

Binz, M. and Schulz, E., 2022. Modeling Human Exploration Through Resource-Rational Reinforcement Learning. *36th Conference on Neural Information Processing Systems (NeurIPS 2022)*. Selected as Oral.

Binz, M., Gershman, S.J., Schulz, E. and Endres, D., 2022. Heuristics From Bounded Meta-Learned Inference. *Psychological Review*.

Brändle, F., **Binz, M.** and Schulz, E., 2022. Exploration Beyond Bandits. *The Drive for Knowledge: The Science of Human Information Seeking. Cambridge University Press.*

Teaching

Computational Cognitive Science, Eberhard Karls University of Tübingen **2022, 2023**
Lecturer

International Interdisciplinary Computational Cognitive Science Summer School **2022, 2023**
Lecturer

Bayesian Statistics and Machine Learning, Philipps-Universität Marburg **2020**
Lecturer

Theoretical Neuroscience, Philipps-Universität Marburg **2019, 2020**
Lecturer

Deep Learning in Data Science, KTH Royal Institute of Technology **2017**
Teaching assistant

Supervision (PhD students)

Julian Coda-Forno (co-supervised with Eric Schulz and Jane Wang) **2022 - present**
Meta-Learning in Large Language Models

Akshay Kumar Jagadish (co-supervised with Eric Schulz) **2021 - present**
Reverse-Engineering Adaptive Principles of Cognition

Supervision (Master and Bachelor students)

Johannes Schubert **2023**
Investigating the Optimism Bias Using Meta-Reinforcement Learning

Luca Schulze Buschoff **2022**
Development as Decompression

Akshay Kumar Jagadish **2021**
Compositional Generalization in Meta-Reinforcement Learning

Gwen Hirsch **2020**

Comparing Meta-Learners with Human Performance in a Continual Learning Framework
Hauke Niehaus **2019**
Simulating Decision-Making Deficits in a Deep Meta-Reinforcement-Learning Agent

Reviewing

Nature	**2023 - present**
Conference on Neural Information Processing Systems (NeurIPS)	**2023 - present**
Trends in Cognitive Sciences	**2023 - present**
Conference on Cognitive Computational Neuroscience	**2023 - present**
Proceedings of the National Academy of Sciences (PNAS)	**2022 - present**
Psychological Review	**2022 - present**
Computational Brain & Behavior	**2022 - present**
Annual Meeting of the Cognitive Science Society	**2021 - present**