Luca M. Schulze Buschoff ✉ **lucaschulzebuschoff@gmail.com**

Education

Ph. D. Computational Cognitive Science and Machine Learning 06.2023 –
MPI for Biological Cybernetics and Helmholtz Munich
Supervisor: Dr. Eric Schulz

M. Sc. Neural and Behavioral Science, University of Tübingen 2019 – 2023
Thesis: The acquisition of physical knowledge in neural networks
Supervisors: Dr. Marcel Binz & Dr. Eric Schulz, MPI for Biological Cybernetics

B. Sc. Psychology, University of Osnabrück 2016 – 2019
Thesis: The role of heartbeat during fast sensorimotor transformations
Supervisors: Dr. Sven Ohl & Prof. Martin Rolfs, Humboldt-Universität zu Berlin

Research Internships

Stanford University, Prof. Tobias Gerstenberg 02.26 – 04.26
Visual cognition in humans

University of Tübingen, Prof. Felix Wichmann 11.20 – 02.21
Error consistency in humans and neural networks

University of Tübingen, Prof. Philipp Berens 09.20 – 11.20
Model comparisons in approximate Bayesian computation

Berlin School of Mind and Brain, Mind Brain Body Institute 11.18 – 12.18
Influence of cardiac cycle activity on perceived object distance

Humboldt-Universität zu Berlin, Dr. Sven Ohl 08.18 – 09.18
Influence of cardiac cycle activity on saccadic eye movements

Professional Experience

Student research assistant, MPI for Biological Cybernetics
Computational Principles of Intelligence, Dr. Eric Schulz 01.22 – 01.23

Student research assistant, University of Tübingen
Neural Information Processing, Prof. Felix Wichmann 04.21 – 12.21
Data Science for Vision Research, Prof. Philipp Berens 03.20 – 08.20

Student research assistant, University of Osnabrück
Statistics and Methodology, Prof. Thomas Staufenbiel 04.18 – 09.19

Teaching assistant, University of Osnabrück
Statistics I & II 10.18 – 08.19
Test theory 04.18 – 08.18
Research methods 10.17 – 03.18

External Funding

International Research Fellowship for Computer Scientists (IFI), DAAD
Research internship at Stanford University, Prof. Tobias Gerstenberg

SUBMITTED

Can vision language models learn intuitive physics from interaction?
L. M. Schulze Buschoff*, K. Voudouris*, C. Demircan, E. Schulz
Under review at ICML 2026

PRE-PRINTS

Next state prediction gives rise to entangled, yet compositional representations of objects
T. Saanum, **L. M. Schulze Buschoff**, P. Dayan, E. Schulz
arXiv

PUBLICATIONS

A foundation model to predict and capture human cognition
M. Binz, ..., **L. M. Schulze Buschoff**, ..., E. Schulz
Nature (2025)

Testing the Limits of Fine-Tuning for Improving Visual Cognition in Vision Language Models
L. M. Schulze Buschoff*, K. Voudouris*, E. Akata, M. Bethge, J. B. Tenenbaum, E. Schulz
International Conference on Machine Learning (ICML 2025)

metabench – A Sparse Benchmark to Measure General Ability in Large Language Models
A. Kipnis, K. Voudouris, **L. M. Schulze Buschoff**, E. Schulz
International Conference on Learning Representations (ICLR 2025)

Visual cognition in multimodal large language models
L. M. Schulze Buschoff*, E. Akata*, M. Betthge, E. Schulz
Nature Machine Intelligence (2025)

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

Trivial or Impossible—dichotomous data difficulty masks model differences (on ImageNet and beyond)
K. Meding*, **L. M. Schulze Buschoff***, R. Geirhos, F. A. Wichmann
International Conference on Learning Representations (ICLR 2022)

WORKSHOP PUBLICATIONS

ImageNet suffers from dichotomous data difficulty
K. Meding*, **L. M. Schulze Buschoff***, R. Geirhos, F. A. Wichmann
ImageNet: past, present, and future workshop (NeurIPS 2021 workshop)

REVIEWING ACTIVITY

Conferences
ICLR
ICML
CogSci
Re-Align workshop at ICLR
World models workshop at ICML
Behavioral ML workshop at NeurIPS

Journals
Computational Brain & Behavior