Dr. Moritz Möller

Berlin, Germany • (+49) 1573 4967134 • moritz.moeller.home@gmail.com • Google Scholar • GitHub

Profile

- Computational neuroscientist (PhD from Oxford), worked on neural mechanisms of reinforcement learning
- Main current research interest: how can neuroscience help to solve hard problems in AI/Robotics?
- Expertise in Neuroscience, AI, Mathematics & Physics, in academia and industry
- Excellent communication, presentation & marketing skills honed by work in strategy consulting at BCG

Education

Ph.D. Computational Neuroscience (no corrections) at the University of Oxford **2017 - 2021**
"Learning about the distribution of rewards through dopamine and the basal ganglia pathways", advised by Rafal Bogacz & Sanjay Manohar, assessed by Tim Behrens & Sam Gershman

M.A.St. Applied Mathematics (distinction) at the University of Cambridge **2016 - 2017**
"Deep Reinforcement Learning"

B.Sc. Physics (grade 1.11) at the Friedrich-Alexander Universität Erlangen-Nürnberg **2012 - 2015**
"Terahertz Waveform Acquisition at a scan rate of 36 KHz"

Employment

Jr. Consultant at the Boston Consulting Group (BCG) **since 2022**
Member of Tech & Digital Advantage Practise Area, creating strategies for AI & Advanced Analytics systems and improving IT efficiency for major global companies

Software Engineering Intern at BMW **2020**
Member of the Research and Development unit for Autonomous Driving, developing machine learning systems and customer functions in python and C++

Funding & Awards

During my Ph.D.
Gates Cambridge Scholarship (£ 45000 + tuition fees, declined) and MRC Research Studentship (£ 44000 + tuition fees)

During my M.A.St. & B.Sc.
Max Weber Scholarship (€ 23000)

Publications

Neuroscience

- **Möller, M.**, Manohar, S., & Bogacz, R. (2022). Uncertainty–guided learning with scaled prediction errors in the basal ganglia. PLoS Computational Biology, 18(5), e1009816.
- **Möller, M.**, Grohn, J., Manohar, S., & Bogacz, R. (2021). An association between prediction errors and risk-seeking: Theory and behavioral evidence. PLoS computational biology, 17(7), e1009213.
- **Möller, M.**, & Bogacz, R. (2019). Learning the payoffs and costs of actions. PLoS computational biology, 15(2), e1006285.

Physics

- Urbanek, B., **Möller, M.**, Eisele, M., Baierl, S., Kaplan, D., Lange, C., & Huber, R. (2016). Femtosecond terahertz time-domain spectroscopy at 36 kHz scan rate using an acousto-optic delay. Applied Physics Letters, 108(12), 121101.

Conferences & Invited talks

Symposium on Biology of Decision Making (SBDM*2021), Online 2021
"Tracking reward unpredictability with scaled prediction errors" (poster presentation)

Computational Neuroscience Meeting (CNS*2020), Online 2020
"A predictive coding model of transitive inference" (poster presentation)

Max Planck Institute for Human Development, Berlin 2020
"Range adaptation and risk effects of dopaminergic prediction errors" (invited talk)

Max Planck Institute for Biological Cybernetics, Tübingen 2019
"Variable feedback impairs learning, but is compensated by dopaminergic range adaptation" (invited talk)

Artifical and biological cognition (ABC*2019), Cambridge 2019
"Reward prediction errors modulate risk preferences" (poster presentation)

Computational Neuroscience Meeting (CNS*2018), Seattle 2018
"Learning the payoffs and costs of actions" (poster presentation)

Teaching

University of Oxford

- Neuroengineering: Master's thesis supervision
- Computational Neuroscience: Lecture
- Statistics for Biomedical Sciences: Tutorial

Johannes Kepler University

- Quantum field theory: Summer school

Friedrich-Alexander Universität Erlangen-Nürnberg

- Theoretical Physics - Electrodynamics: Tutorial
- Theoretical Physics - Mechanics: Tutorial

Other activities

Organiser
Organised two talks for the Neurotheory Seminar Series at the University of Oxford, inviting researchers from UCL and Deepmind

Reviewer
Reviewed articles for PLoS Computational Biology and Communications in Nonlinear Science and Numerical Simulation

COVID-19 Data Scientist
Created an interactive COVID-19 literature atlas as a contribution to the COVID-19 Open Research Dataset Challenge on Kaggle

Brain-Computer Interface Designer
Won IEEE Brain prize in a BCI Hackathon with an EEG-controlled file browsing system

Ball chair at St Cross College, Oxford
Planned a summer ball for 250 guests, with a budget of 20k, recruiting and leading a committee of 12

Refugee supporter
Provided weekly support sessions and language training to a refugee who suffered from brain cavernomas