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Dr. Lennart Wittkuhn

Postdoctoral Researcher & Lab Manager

Last update: March 2024 (click to open hyperlinks)

Professional experience

Current position

since 04/23 Postdoctoral Researcher & Lab Manager, University of Hamburg, Germany
 ☆ Research Group "Cognitive Neuroscience" (PI: Prof. Dr. Nicolas Schuck)
 i investigate neural replay in the human brain using fMRI as a Postdoctoral Researcher and manage core research infrastructure and lab resources (code, data, docs) as a Lab Manager

Previous positions

- 10/22–03/23 Postdoctoral Researcher, Max Planck Institute for Human Development, Berlin
 ☆ Max Planck Research Group "NeuroCode" (PI: Prof. Dr. Nicolas Schuck)
 ☆ Max Planck UCL Centre for Computational Psychiatry and Ageing Research, Berlin
 i Continuation of my PhD work on investigating replay in the human brain using fMRI
- 10/17-12/21 Pre-doctoral research fellow, Max Planck Institute for Human Development, Berlin
 ☆ Max Planck Research Group "NeuroCode" (PI: Prof. Dr. Nicolas Schuck)
 È Dissertation work: The main goal of my dissertation was to investigate neural replay of task representations and its role in learning and planning in the human brain using fMRI
- Spring 2017 Research intern, Concordia University Montreal, Canada
 ▲ Department of Psychology (PI: Prof. Ben Eppinger)
 I programmed a behavioral task using MATLAB (with PsychToolbox) to investigate adaptive decision-making in dynamic environments and analyzed the behavioral data using MATLAB and R

Summer 2016 Clinical intern, Charité University Hospital Berlin, Germany ☆ Department of Clinical Neuropsychology (Head: Dr. Ute Kopp) i conducted neuropsychological examinations (e.g., memory and executive functions) with neurology patients (e.g., with Parkinson's disease and dementia) and wrote medical reports

Spring 2015 Research intern, University College London, United Kingdom

Affective Brain Lab (PI: Tali Sharot, Ph.D.; supervised by Neil Garrett, Ph.D.)
 □ programmed two behavioral tasks using MATLAB (with Cogent 2000) to investigate risky decisions, collected and analyzed behavioral and skin conductance response data

Education

Postgraduate education

- - Grade: summa cum laude ("with highest honor")
 - Ø doi: 10.17169/refubium-34672
 - Let Advisors: Prof. Dr. Nicolas Schuck (MPIB) & Prof. Radoslaw M. Cichy (FU Berlin)
- 10/15–09/17 M.Sc. in Cognitive-Affective Neuroscience, Technische Universität Dresden
 ☐ Thesis: "Inferring changes in latent states in dynamic environments"
 ♣ Grade: 1.2 (very good; roughly equivalent to A- / GPA of 3.7)
 ♣ Advisors: Prof. Ben Eppinger, Prof. Hauke Heekeren, M.Sc. Rasmus Bruckner

Undergraduate education

10/12–09/15 **B.Sc. in Psychology**, Technische Universität Dresden ■ Thesis: "Effects of age and prefrontal rTMS on learning to predict future reward" # Grade: 1.3 (very good; roughly equivalent to A- / GPA of 3.7) ■ Advisors: Prof. Ben Eppinger, Prof. Shu-Chen Li

Specialized training and educational courses (selection)

- 02/2020 Workshop "A Reproducible Data Analysis Workflow",
 ♥ Max Planck Institute for Human Development, Berlin, Germany
 ☑ Full-day workshop on reproducible data analyses with R Markdown, Git, Make, and Docker
- 11/2019 Symposium "Doing Good–Scientific Practice under Review",
 ♥ Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany
 ☑ 2-days symposium on good scientific practices and open science
- 08/2019 Summer school on Methods in Neuroscience at Dartmouth (MIND),
 ♥ Dartmouth College, Hanover, New Hampshire, USA
 ☑ 10-days computational neuroscience summer school on "cognitive maps"
- 06/2019 Hackathon at the Organization for Human Brain Mapping Meeting 2019,
 ♥ Auditorium Parco Della Musica, Rome, Italy
 ☑ 3-days neuroinformatics hackathon, before the OHBM Annual Meeting 2019

Publications

Preprints

2022 Wittkuhn, L., Krippner, L. M., & Schuck, N. W. (2021) Statistical learning of successor representations is related to on-task replay. *bioRxiv*. doi: 10.1101/2022.02.02.478787

Peer-reviewed journal articles

- 2021 Wittkuhn, L., Chien, S., Hall-McMaster, S., & Schuck, N. W. (2021) Replay in minds and machines. *Neuroscience & Biobehavioral Reviews (129)*, 367-388. doi: 10.1016/j.neubiorev.2021.08.002
- 2021 Wittkuhn, L., & Schuck, N. W. (2021) Dynamics of fMRI patterns reflect sub-second activation sequences and reveal replay in human visual cortex. *Nature Communications* (12), 1795. doi: 10.1038/s41467-021-21970-2
- 2018 Wittkuhn, L., Eppinger, B., Bartsch, L. M., Thurm, F., Korb, F. M., & Li, S.-C. (2018) Repetitive transcranial magnetic stimulation over dorsolateral prefrontal cortex modulates value-based learning during sequential decision-making. *NeuroImage (176)*, 384-395. doi: 10.1016/j.neuroimage.2017.11.057

Conference proceedings

2019 Wittkuhn, L., & Schuck, N. W. (2019) Detecting sub-second activation sequences with sequential fMRI pattern analysis. 2019 Conference on Cognitive Computational Neuroscience, 13–16 September 2019, Berlin, Germany. doi: 10.32470/CCN.2019.1253-0

 \mathcal{Q} Conference presentations and posters

- 03/2024 Digital and Data Literacy in Teaching Lab, ♥ University of Hamburg, Germany
 Itile: "Version Control of Code and Data: A full-semester course about Git for scientists"
 Authors: Wittkuhn, L., & Pagenstedt, K.
 Poster: lennartwittkuhn.com/ddlitlab-presentation
 doi: 10.25592/uhhfdm.14162
- 06/2021 **Psychologie und Gehirn (PuG) 2021**, ♥ Online I Poster: "Dynamics of fMRI patterns reflect sub-second activation sequences and reveal replay in human visual cortex" ♣+ Authors: Wittkuhn, L., & Schuck, N. W.
- 09/2019 Conference on Cognitive Computational Neuroscience (CCN), ♥ TU Berlin I Poster: "Detecting sub-second activation sequences with sequential fMRI pattern analysis" ♣+ Authors: Wittkuhn, L., & Schuck, N. W.
- 06/2019 Organization for Human Brain Mapping (OHBM) Annual Meeting 2019,
 ♥ Auditorium Parco della Musica, Rome, Italy
 Image: Poster: "Detecting fast sub-second activation sequences with sequential fMRI pattern analysis"
 ♣+ Authors: Wittkuhn, L., & Schuck, N. W.
- 05/2019 Royal Society: "Memory reactivation: replaying events past, present and future",
 ♥ Kavli Royal Society Centre, Newport Pagnell, United Kingdom
 Image: Poster: "Tracking fast sequential neural events in humans using sequential fMRI pattern analysis" ♣+ Authors: Wittkuhn, L., & Schuck, N. W. (presented by Schuck, N. W.)
- 09/2018 **Replay @ CUBRIC**, **♥** CUBRIC, Cardiff, United Kingdom ■ Poster and talk: "Tracking fast sequential neural events in humans using fMRI" **▲+** Authors: Wittkuhn, L., & Schuck, N. W.

Talks

About my research

- 11/2022 **General Psychology Lab**, PI: Sebastian Gluth, ♥ University of Hamburg, Germany □ Talk: "Investigating replay of task representations in the human brain using fMRI" (online)
- 03/2022 **Center for Mind/Brain Sciences**, PI: Roberto Bottini, **♀** University of Trento, Italy **⊡** Talk: "Investigating replay of task representations in the human brain using fMRI" (online)
- 08/2021 **Physiology of Action Lab**, PI: Valeria Della-Maggiore, **♀** University of Buenos Aires **□** Talk: "Dynamics of fMRI patterns reflect sub-second activation sequences and reveal replay in human visual cortex" (online)
- 01/2021 Learning, Memory & Decision Lab, PI: Matthew Nassar, ♥ Brown University, USA □ Talk: "Dynamics of fMRI patterns reflect sub-second activation sequences and reveal replay in human visual cortex" (online)
- 01/2021 **COMP2PSYCH Doctoral Colloquium**, ♥ Max Planck UCL Centre for Computational Psychiatry and Ageing Research, Berlin, Germany □ Talk: "Dynamics of fMRI patterns reflect sub-second activation sequences and reveal replay in human visual cortex"

- 11/2017 COMP2PSYCH Fall Academy 2017, ♥ Max Planck UCL Centre for Computational Psychiatry and Ageing Research, Berlin, Germany
 ☑ Talk: "Tracking fast sequential replay events in humans using fMRI"

About open science, reproducibility and research data management

- 03/2024 6th Research Data Management Workshop 2024 on Research Data Management in the Max Planck Society, ♥ Max Planck Institute for Astronomy, Heidelberg, Germany I Talk: "Reproducible Research Data Management with DataLad" (hybrid) I Slides: lennartwittkuhn.com/talk-mps-fdm-2024 I to: 10.5281/zenodo.10844704
- 10/2023 "Digital Total", ♥ University of Hamburg, Germany
 ☑ Talk: "Science as distributed open-source knowledge development"
 ☑ Slides: lennartwittkuhn.com/digital-total
 ④ doi: 10.25592/uhhfdm.13467
- 08/2023 Digital Research Academy Train-the-Trainer program
 ☑ Talk: "Reproducible and FAIR Teaching Materials" (online)
 ☑ Slides: lennartwittkuhn.com/dra-fair-teaching
 ☑ doi: 10.5281/zenodo.8296951

- 05/2023 Symposium on "Reproducible Research: Education and Teaching Formats Reports From the Reproducibility Networks", ♥ QUEST Center, Berlin, Germany □ Talk: "A full-semester course on 'Version control of code and data using Git and DataLad'" ♥ doi: 10.5281/zenodo.7926692
- 04/2023 **Department of Education & Psychology**, **♥** Freie Universität Berlin, Germany Image: Talk: "Open and reproducible data management with DataLad" (online) Image: Open and reproducible data management with DataLad" (online) Image: Open and reproducible data management with DataLad" (online)
- 01/2023 **Open Science Initiative Psychology (OSIP)**, **♥** Technical University Dresden, Germany □ Talk: "Tools for an open and reproducible research workflow" (online) • doi: 10.5281/zenodo.7554142
- 09/2022 **5th Research Data Management Workshop 2022**, **♥** Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany Image: Talk: "Tools for an open and reproducible research workflow" (hybrid) Image: workflow doi: 10.5281/zenodo.7075084
- 10/2021 Lifespan Neural Dynamics Group, PI: Douglas Garrett, ♥ MPI for Human Development □ Talk: "A research workflow with DataLad" (online) ♥ doi: 10.5281/zenodo.5012477
- 10/2021 **Open Science Ambassadors Day 2021**, **♥** Max Planck PhDnet & Digital Library **■** Talk: "Tools for an open and reproducible workflow" (online) **●** doi: 10.5281/zenodo.5575219
- 06/2021 Max Planck Digital Library, ♥ Max Planck Society, Munich, Germany □ Talk: "Towards a workflow for open and reproducible MRI studies" (online) ♥ doi: 10.5281/zenodo.5012477

T Awards, funding and fellowships

Funding

2023–2024 **Digital and Data Literacy in Teaching Lab grant**, awarded by the Digital and Data Literacy in Teaching Lab (DDLitLab) initiative at the University of Hamburg (role: PI) 50,000 € funding for a course on "Version control of code and data using Git and DataLad"

Fellowships

2020–2021 **ReproNim/INCF Training Fellowship**, awarded by the Center for Reproducible Neuroimaging Computation and International Neuroinformatics Coordinating Facility Full year Train-the-Trainer fellowship program which provides fellows with conceptual and practical training in reproducible neuroimaging

Travel stipends

- 2019 **DAAD travel stipend**, awarded by the German Academic Exchange Service for my conference trip to the OHBM Annual Meeting 2019 in Rome, Italy
- 2017 **DAAD PROMOS stipend**, awarded by the German Academic Exchange Service for my research visit to the Department of Psychology at Concordia University Montreal
- 2015 **Erasmus+ stipend**, awarded by the Saxon Erasmus+ Internship Consortium for my research visit to the Affective Brain Lab at University College London

	Skills
Coding	Python, R, MATLAB, Bash
Development	Git (GitHub, GitLab), DataLad, high-performance computing (Slurm, Torque), software containers (Docker, Singularity), continuous integration (Travis, GitLab Cl, GitHub Actions)
Data Analysis	Nipype, NiLearn, scikit-learn, SPM12, fMRIPrep, MRIQC, Brain Imaging Data Structure
Task Design	PsychoPy (Python), PsychToolbox & Cogent 2000 (MATLAB)
Methods	functional and structural magnetic resonance imaging (MRI), online behavioral studies (Prolific, Pavlovia, LimeSurvey), electroencephalography (EEG), skin conductance response (SCR) measurement, transcranial magnetic stimulation (TMS), transcranial direct-current stimulation (tDCS)
Writing	LATEX, Markdown, MS Office, Literate Programming (in Jupyter, RMarkdown, Quarto)
Design	Adobe Photoshop, Adobe Illustrator, Affinity Designer
Languages	German (native), English (fluent), French (basic)
	Teaching
Winter 23/24	Course on "Version Control of Code & Data" , University of Hamburg Full-semester hands-on course aboutt on version control using Git
06/2021	Git Workshop "Git for Scientists" , Max Planck Research Group NeuroCode Half-day online workshop on version control using Git (with Christoph Koch & Ondrej Zika)
10/2020	Data Management Workshop with DataLad , for MPIB / FZ Jülich (online) Full-day online workshop on data management using DataLad (with Adina Wagner) Links to: Workshop Website — Workshop recordings on YouTube
12/2019	Introduction to git , Max Planck Institute for Human Development Hands-on introductory workshop on the version-control system git
07/2019	Introduction to fMRIPrep, Lab of Christian Doeller Introductory tutorial how to run fMRIPrep for pre-processing fMRI data
Winter 18/19	fMRI data analysis and pre-processing , MPI for Human Development I organized and partly taught a weekly meeting on fMRI data analysis and data pre-processing
	A Professional memberships
since 09/2023	German Society for Psychology (DGPs)
2019–2020	Organization for Human Brain Mapping (OHBM)
	N Media coverage
11/2019	"Neuroplastizität: Wie das Gehirn sich neu strukturiert" , <i>Bayern 2</i> Rebroadcast of the radio podcast featuring our work on replay in humans (in German)
11/2018	"Kommandozentrale Gehirn" , <i>Bayerischer Rundfunk (Bayern 2), radioWissen</i> Radio podcast featuring our work on replay in humans (in German)
	PMentoring and supervision

Research assistants

- since 06/23 Konrad Pagenstedt, Bachelor's student, Psychology
- 2019 2020 Sudeshna Bora, Masters's student, Computational Neuroscience
- 2019 2020 Lena Krippner, Masters's student, Berlin School of Mind and Brain
- 2018 2020 Anika Löwe, Masters's student, Social, Cognitive and Affective Neuroscience

Interns

- 2019 **Leonardo Pettini**, *Masters's student*, Berlin School of Mind and Brain Now: PhD candidate at the Max Planck School of Cognition, Berlin, Germany
- 2018 Lion Schulz, Bachelor's student, Technische Universität Dresden Now: PhD candidate at the Department Computational Neuroscience, Max Planck Institute for Biological Cybernetics, Tübingen, Germany

Professional services and extracurricular activities

- since 12/2022 **Project Coordinator of the Castellum Task Force**, University of Hamburg I coordinate a task force that aims to implement a privacy-compliant participant database.
- since 10/2022 Member of the Institutional Review Board (IRB), MPI for Human Development I contribute to the ethics committee that reviews proposals for research involving human subjects.
- since 01/2021 **Member of Research Data Management group**, MPI for Human Development I contribute to the institutionalized, cross-departmental management of research data.
 - 2019–2022 **PhD wiki administrator**, MPI for Human Development I created and since maintain a git-based wiki for PhD students.

99 References

Prof. Dr. Nicolas Schuck, PhD & Postdoc advisor
Professor of Psychology (Chair of "Cognitive Neuroscience: Mechanisms of Learning and Change")
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Associate Professor at the Department of Psychology
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Prof. Shu-Chen Li, Ph.D., Bachelor's advisor Professor at the Chair of Lifespan Developmental Neuroscience Technische Universität Dresden Zellescher Weg 17, 01062 Dresden, Germany ☑ shu-chen.li@tu-dresden.de

Univ.-Prof. Dr. Hauke Heekeren, Master's advisor

President of the University of Hamburg University of Hamburg, Mittelweg 177, 20148 Hamburg, Germany ☑ praesident@uni-hamburg.de