

Curriculum Vitae - 2024

Name: Robert Tjarko Lange
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Professional Experience

Jan 2024 – **Sakana.AI, Tokyo, Japan**
Research Scientist & Founding Member. We build nature-inspired large models.

Jun 2023 – Dec 2023 **Google DeepMind, Berlin, Germany & Tokyo, Japan**
Graduate Student Researcher (full-time). Host: Yujin Tang, Yingtao Tian

Jun 2022 – Nov 2022 **DeepMind, London, UK**
Research Scientist Intern. Host: S. Flennerhag & Discovery team (Lead: S. Singh)

Oct 2019 – Jun 2023 **Science of Intelligence Cluster of Excellence, Berlin, Germany**
Research Assistant: Project: ‚Learning of Intelligent Swarm Behavior‘

Oct 2018 – Oct 2019 **Einstein Center for Neuroscience, Berlin, Germany**
Research Assistant/Lab Rotations in Cognitive Computational Neuroscience.
Worked with F. Blankenburg (FUB); H. Sprekeler (TUB); R. Cichy (FUB)

Apr 2017 – Jul 2017 **Accenture Analytics Innovation Center, Barcelona, Spain**
Applied Data Science Intern. Projects in Computer Vision, Robotics & NLP

Mar 2014 – Mar 2016 **Center for Macroeconomic Research, Cologne, Germany**
RA & TA to Prof. Helge Braun (RGS Econ) & Prof. A. Ludwig (SAFE Frankfurt).
Research on the interaction of retirement and unemployment insurance systems.

Education

Oct 2019 – **Technical University Berlin, Berlin, Germany**
Ph.D. Studies in Evolutionary Meta-Learning
Supervision: Henning Sprekeler

Oct 2017 – Sep 2018 **Imperial College London, London, UK**
MSc in Computing (Specialism: Machine Learning - Distinction)
Supervision: Aldo Faisal

Sep 2016 – July 2017 **Barcelona Graduate School of Economics (UPF/UAB), Barcelona, Spain**
MSc in Data Science (GPA: 9.04/10.00 - Ranked 2nd out of 25)
Supervision: Omiros Papaspiliopoulos & Ioannis Kosmidis (UoWarwick)

Oct 2012 – Feb 2016 **University of Cologne, Cologne, Germany**
BSc in Economics (GPA: 1.4/1.0 - Top 5% of Cohort)

Sep 2005 – Jun 2012 **Ernst-Mach-Gymnasium, Hürth, Germany**
A-levels (GPA: 1.4/1.0) being 16 years old - Shortening 2nd, 9th & 10th grade

Scholarships & Awards

Oct 2023 **DAAD IFI Scholarship for visiting the University of Oxford. Declined**

Jun 2023 **G-Research Grant for Ph.D. students in a Quantitative Field (2k£ Pounds)**

May 2023 **GECCO Conference Student Travel Award (~500\$ Dollars)**

Dec 2021 **Google Cloud Research Credit Grant Recipient (1K\$ GCP Credits)**

Oct 2018 – Oct 2019 **Einstein Center for Neurosciences Berlin - Research Scholarship**

Oct 2018 **Best MSc Specialism Project 2018 - ICL - DoC (sponsored by Winton Capital)**

Sep 2016 **Award of 50% tuition fee waiver by the BGSE (UPF/UAB) faculty**

Jun 2014 **Dean’s Award of the University of Cologne (Top 10% of faculty students)**

2012 – 2018 **German National Academic Foundation (‚Studienstiftung‘) - Scholarship**

Teaching & Supervision Experience

2022 **Teaching Assistant at the [M2L Summer School](#) organized by DeepMind**

2019 – 2023 **MSc Student Supervision - Sprekeler Lab, TU Berlin**
4 lab rotation students: N. Moneta, M. Vischer, D. Müller, L. Johnson
3 MSc theses students: M. Vischer, D. Müller, J. Liesen

2019 – 2023 **Teaching Assistant - ‚Models of Higher Brain Function‘, TU Berlin**
Teaching lectures on Deep Reinforcement Learning & supervision of project

2014 – 2016 **Teaching Assistant - ‚Introduction to Macroeconomics‘, UoCologne**

Poster Presentations, Talks & Science Outreach (Recordings)

- 2023 *Posters:* ICLR 2023, GECCO 2023, NeurIPS 2023
Talks: TU Berlin RL Seminar, BLISS Group, UCL Dark, FLAIR (02/23), PyData Berlin, [AutoML seminar](#), DLCT reading group (04/23), [Multi-Agent Learning Seminar](#) Google/Berkeley (06/23)
- 2022 *Posters:* AAAI 2022, ICLR 2022, Sparsity in Neural Networks Workshop
Talks: CSHL Neuro AI Seminar (invited by T. Zador; 01/22), Cohere (invited by J. Araújo; 02/22), [ML Collective Research Jam](#) (03/22), ML Collective DLCT Reading Group (04/22), [ML Collective Research Jam](#) (09/22), [Foerster AI Lab](#), [Adaptive & Intelligent Robotics Lab](#) (11/22)
Podcasts: [Deep Minds Mixed](#) (being interviewed)
- 2021 *Posters:* ICLR Workshop (A Roadmap to Never-Ending RL), Sparsity in Neural Networks Workshop, Champalimaud Research Symposium
Talks: Warwick Ph.D. Statistics Seminar (02/21), MIT M. Carbin Lab (invited by J. Frankle; 03/21), CCN 2021 Algonauts WS (5th place [report talk](#); 09/21)
Podcasts: [ML Street Talk](#) (interviewing Tom Zahavy), [TalkRL](#) (being interviewed)
- 2020 *Posters:* MLSS Summer School (Virtual), NeurIPS Workshop (Meta-Learning)
Talks: SCIOI Excellence Cluster Morning Talks (11/20)
Podcasts: [ML Street Talk](#) (being interviewed)
- 2019 *Posters:* NeurIPS Workshop (Deep RL, Transferable Skills), Cognitive Computational Neuroscience Conference, Eastern European ML Summer School, RAAI Conference, FENS ENCODS
- 2017 *Posters:* DS³ Summer School École Polytechnique (Paris)

Open Source & ML Community Projects

- 2022 **'gymnax'** [\[Link\]](#), [\[Talk\]](#): A JAX-Based Gym API (Accelerated RL Environments)
- 2022 **'evosax'** [\[Link\]](#), [\[Talk\]](#): A JAX-Based Library of Evolution Strategies
- 2021 – **Machine Learning Experiment (MLE) Infrastructure** [\[Link\]](#)
'mle-logging' [\[Link\]](#): A Lightweight Machine Learning Experiment Logging Tool
'mle-hyperopt' [\[Link\]](#): A Lightweight Hyperparameter Optimization Tool
'mle-scheduler' [\[Link\]](#): A Lightweight Cluster/Cloud VM Job Management Tool
'mle-monitor' [\[Link\]](#): A Lightweight Cluster/Cloud Resource Monitoring Tool
- 2019 – **Visual Machine Learning Notes & ML Collage** [\[Link\]](#), [\[Link\]](#)
Sketch notes from ML talks/conferences/summer schools & accessible paper summaries.
- 2019 – **Machine Learning Blog with Code** [\[Blog\]](#), [\[Code\]](#)
Blog posts on topics in Deep (Reinforcement) Learning (e.g. Meta-Gradients, JAX, etc.).
- 2016 **UNHCR IOM - Migrant Death Report/News Filter** [\[Link\]](#)
App scraping migrant death reports from Google News/Twitter & classifies their credibility.

Further Academic Activities

- 2020 – Reviewer - Meta-Learning Workshop at NeurIPS, IFAC Workshop on Discrete Event Systems
- 2020 – Independent researcher at for.AI - A distributed AI Research Collaboration [\[Link\]](#)
- 2019 – Organiser ‚Flexible Learning‘ Reading Group (Meta, Transfer, Continual, etc.) at TU Berlin [\[Link\]](#)
- 2018 Part of Advanced Data Science Team at ICL Data Science Society [\[Link\]](#)
- 2017 Editor-in-Chief of Barcelona GSE Data Science Student Blog [\[Link\]](#)
- 2016 – Summer schools: Analysis - [LSE](#) (16'), ML - [DS³](#) (17'), [EEML](#) (19'), [MLSS](#) (20'), [M2L](#) (21')

Further Non-Academic Activities

- 2016 – 2021 Member of ‚Kölischer Kunstverein‘ (Cologne Art Society)
- 2013 – 2021 Member of ‚Freunde des Wallraf-Richartz-Museum und des Museums Ludwig e.V.‘
- 2011 – Member of ‚Mensa in Deutschland e.V.‘ (Mensa in Germany)
- 2011 Participation in the ‚Magic: The Gathering‘ German National Championships (Rating)
- 2008 Participation in the ‚Magic: The Gathering‘ Pro Tour in San Diego (PTQ qualified 2x more)

Language & Coding Skills

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|-------------|--|------------------------------|-------------------------------|------------------------------|
| Languages | German Mother tongue | Italian Basic (A1) | English Fluent (C1) | Spanish Basic (A1) |
| Programming | Python, R, Git, Shell, GridEngine, Slurm, GCP, AWS – advanced | | | |

Publication List — Robert Lange — Last Updated: 06/24

Journal Publications (* - Shared First Authorship)

- 2023 Gómez-Nava, L., **Lange, R.T.**, Klamser, P.P., Lukas, J., Arias-Rodriguez, L., Bierbach, D., Krause, J., Sprekeler, H. and Romanczuk, P., 2023. 'Fish shoals resemble a stochastic excitable system driven by environmental perturbations'. *Nature Physics*, pp.1-7. [[Paper](#) | [Code](#)]
- 2021 Gijssen*, S., Grundei*, M., **Lange, R.T.**, Ostwald, D. and Blankenburg, F., 2021. 'Neural surprise in somatosensory Bayesian learning'. *PLoS computational biology*, 17(2), p.e1008068. [[Paper](#) | [Code](#)]

Peer-Reviewed Conference Publications

- 2023 **Lange, R.T.**, Tang, Y. and Tian, T., 2023. 'NeuroEvoBench: Benchmarking Neuroevolution for Large-Scale Machine Learning Applications'. *NeurIPS Track on Datasets and Benchmarks 2023*. [[Paper](#) | [WWW](#) | [Code](#)]
- Lange, R.T.** and Sprekeler, H., 2023. 'Lottery Tickets in Evolutionary Optimization: On Sparse Backpropagation-Free Trainability'. *ICML 2023*. [[Paper](#) | [Code](#)]
- Lange, R.T.**, Schaul, T., Chen, Y., Lu, C., Zahavy, T., Dallibard, V. and Flennerhag, S., 2023. 'Discovering Attention-Based Genetic Algorithms via Meta-Black-Box Optimization'. *GECCO 2023. Nominated for Best Paper Award (GA Track)* [[Paper](#) | [Code](#)]
- Lange, R.T.**, Schaul, T., Chen, Y., Zahavy, T., Dallibard, V., Lu, C., Singh, S. and Flennerhag, S., 2023. 'Discovering Evolution Strategies via Meta-Black-Box Optimization'. *ICLR 2023*. [[Paper](#) | [OpenReview](#)]
- 2022 **Lange*, R.T.**, Vischer*, M.A. and Sprekeler, H., 2021. 'On lottery tickets and minimal task representations in deep reinforcement learning'. *ICLR 2022 Spotlight*. [[OpenReview](#)]
- Lange, R.T.** and Sprekeler, H., 2022. 'Learning not to learn: Nature versus nurture in silico'. In *Proceedings of the AAAI Conference on Artificial Intelligence* (Vol. 36, No. 7, pp. 7290-7299) [[Paper](#)]

Workshop Publications & Pre-Prints

- 2024 Lu*, C., Lu*, C., **Lange*, R.T.**, Foerster, J. N., Clune, J., Ha, D., 2024. 'The AI Scientist: Towards Fully Automated Open-Ended Scientific Discovery'. *Arxiv Preprint*. [[Paper](#) | [Code](#) | [Blog](#) | [Tweet](#)]
- Lu, C., Holt, S., Fanconi, C., ..., **Lange, R.T.** 2024. 'Discovering Preference Optimization Algorithms with and for Large Language Models'. *Arxiv Preprint*. [[Paper](#) | [Code](#)]
- Lange, R.T.**, Tian, T. and Tang, Y. 2024. 'Evolution Transformer: In-Context Evolutionary Optimization'. *Poster presentation at GECCO 2024*. [[Paper](#) | [Code](#)]
- Lange, R.T.**, Tian, T. and Tang, Y. 2024. 'Large Language Models as Evolution Strategies'. *Poster presentation at GECCO 2024*. [[Paper](#)]
- 2022 **Lange, R.T.**, 2022. evosax: JAX-based Evolution Strategies. *arXiv preprint arXiv:2212.04180*. *Poster presentation at GECCO 2023*. [[Paper](#) | [Code](#)]
- 2019 **Lange*, R.T.**, Christodoulou*, P., Shafiq, A. and Faisal, A.A., 2019. Reinforcement Learning with Structured Hierarchical Grammar Representations of Actions. *arXiv preprint arXiv:1910.02876*. [[Paper](#)]
- Lange, R.T.** and Faisal, A., 2019. Semantic RL with Action Grammars: Data-Efficient Learning of Hierarchical Task Abstractions. *Deep RL Workshop NeurIPS 2019*. [[Paper](#)]
- 2017 **Lange, R.T.**, 2017. Randomized numerical linear algebra for generalized linear models with big datasets. *Public repository - Universitat Pompeu Fabra* [[Paper](#) | [Code](#)]