Lukas Schäfer

🌐 lukaschaefer.com   ⚥ Lukas Schäfer   ⌨ LukasSchaefer
🔗 lukas-schaefer   ✈ luki.schaefer96@gmail.com   📱 +44 7925 103212

🎓 EDUCATION

PhD Data Science & Artificial Intelligence
University of Edinburgh

12/2019 -- Present
Edinburgh, United Kingdom

- Supervisors: Stefano V. Albrecht (primary) and Amos Storkey (secondary) | Expected graduation: March 2024
- Project: Sample Efficiency and Generalisation in Multi-Agent Reinforcement Learning
- Receiving **Principal's Career Development Scholarship** from the University of Edinburgh
- Organisation and hosting of **RL reading group** with speakers from leading industry (MSR, Google Brain, Deepmind, FAIR) and academic (Oxford University, McGill University, Georgia Institute of Technology, National University of Singapore) labs

M.Sc. Informatics
University of Edinburgh

09/2018 -- 08/2019
Edinburgh, United Kingdom

- Degree classification: **Distinction** (77.28%)
- Received **DAAD** (German Academic Exchange Service) **graduate scholarship** and **Stevenson Exchange Scholarship**

B.Sc. Computer Science, minor subject Japanese
Saarland University

10/2015 -- 09/2018
Saarbrücken, Germany

- Degree classification: grade of **1.2** (German scale) - within **top 5%**

📖 PUBLICATIONS

Peer-Reviewed Publications

[1] **Lukas Schäfer**, F. Christianos, J. P. Hanna, and S. V. Albrecht, "Decoupled reinforcement learning to stabilise intrinsically-motivated exploration," in *International Conference on Autonomous Agents and Multiagent Systems (26% acceptance rate)*, 2022.

[2] **Lukas Schäfer**, "Task generalisation in multi-agent reinforcement learning," in *International Conference on Autonomous Agents and Multiagent Systems, Doctoral Consortium*, 2022.

[3] R. Zhong, D. Zhang, **Lukas Schäfer**, S. V. Albrecht, and J. Hanna, "Robust on-policy data collection for data efficient policy evaluation," in *Advances in Neural Information Processing Systems (26% acceptance rate)*, 2022.

[4] G. Papoudakis, F. Christianos, **Lukas Schäfer**, and S. V. Albrecht, "Benchmarking multi-agent deep reinforcement learning algorithms in cooperative tasks," in *Neural Information Processing Systems (26% acceptance rate), Datasets and Benchmarks Track*, 2021.

[5] **Lukas Schäfer**, F. Christianos, J. P. Hanna, and S. V. Albrecht, "Decoupling exploration and exploitation in reinforcement learning," in *ICML Workshop on Unsupervised Reinforcement Learning (URL)*, 2021.

[6] F. Christianos, **Lukas Schäfer**, and S. V. Albrecht, "Shared experience actor-critic for multi-agent reinforcement learning," in *Neural Information Processing Systems (20% acceptance rate)*, 2020.

Selected Preprints

[7] **Lukas Schäfer**, F. Christianos, A. Storkey, and S. V. Albrecht, "Learning task embeddings for teamwork adaptation in multi-agent reinforcement learning," *arXiv preprint arXiv:2207.02249*, 2022.

📊 SKILLS

Programming
Python · C++ · SML · Bash

Technologies and Tools
PyTorch · NumPy · UNIX · Git

Languages
Native in German · Fluent in English · Beginner in Chinese

Soft Skills
Teamwork · Teaching · Communication · Organisation

💼 EXPERIENCE

Young Research Attendee
HEIDELBERG LAUREATE FORUM

09/2022
HEIDELBERG, GERMANY

> Selected as one of 200 international young researchers in mathematics and computer science
> Discussed research and connected with laureates of the most prestigious awards in mathematics and computer science

Research Intern
HUAWEI NOAH'S ARK LAB

07/2022 -- Present
LONDON, UNITED KINGDOM

> Research multi-agent reinforcement learning algorithms capable of learning behaviour which transfers to new tasks

Research Intern
DEMATIC - TECHNOLOGY AND INNOVATION

11/2020 -- 03/2021
REMOTE

> Applying state-of-the-art AI technology to automate large-scale robotic warehouse logistics

📖 DISSERTATIONS

M.Sc. Dissertation, Autonomous Agents Research Group
CURIOSITY IN MULTI-AGENT REINFORCEMENT LEARNING (74%)

05/2019 -- 08/2019

> Applied count- and prediction-based intrinsic rewards as exploration bonuses to multi-agent reinforcement learning (MARL)
> Evaluated MARL with curiosity under partial observability and sparse rewards in multi-agent particle environments
> Proposed multi-agent curiosity led to improved stability and convergence of policy-gradient MARL in sparse-reward tasks

B.Sc. Dissertation, Foundations of Artificial Intelligence (FAI) Group
DOMAIN-DEPENDENT POLICY LEARNING USING NEURAL NETWORKS IN CLASSICAL PLANNING (1.0)

04/2018 -- 07/2018

> Transferred policy learning Action-Schema Networks to classical automated planning with adjusted training scheme, Keras implementation and extension of the FastDownward planning framework
> Extensive evaluation and analysis on IPC domains identifying limitations in generalisation and scalability

🖥️ TEACHING EXPERIENCE

Teaching Assistant, University of Edinburgh
REINFORCEMENT LEARNING, SCHOOL OF INFORMATICS

10/2019 -- Present

> **Delivering lectures** and **designing RL coursework** covering wide range of topics from single- to multi-agent and deep RL
> Marking project and exam for reinforcement learning course

M.Sc. Student Supervision, University of Edinburgh

02/2021 -- 08/2021

> Co-supervised two M.Sc. students through project proposal, refinement and execution towards final thesis
> Assisted M.Sc. student from their thesis towards a **successful publication at NeurIPS 2022**

Voluntary Lecturer and Coach, Saarland University
MATHEMATICS PREPARATION COURSE

09/2017 -- 10/2017

> Explained formal languages and predicate logic to ~ 250 participants in daily lectures of the first week
> Supervised two groups to provide feedback and further assistance in daily coaching-sessions
> The course received **BESTE-award** for special student commitment 2017 of Saarland University

Teaching Assistant, Saarland University
PROGRAMMING 1, DEPENDABLE SYSTEMS AND SOFTWARE GROUP

10/2016 -- 03/2017

🔍 REVIEWING

> **Conferences**: NeurIPS 2022, ICML 2022 (**top 10% outstanding reviewer award**), NeurIPS 2021 and 2022 Datasets and Benchmarks Track, AAMAS 2022
> **Workshops**: Pre-Registration Experiment Workshop at NeurIPS 2020

[REFERENCES AVAILABLE ON REQUEST]