Lukas Schäfer

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SKILLS

Programming

Competent
Python • C++ • C • Java • SML
Familiar
Rust • HTML • CSS • Matlab • Bash

Technologies and Tools

TensorFlow • Keras • NumPy • UNIX • Git • Vim

Languages

Native in German • Fluent in English • advanced in French • beginner in Japanese

EDUCATION

M.Sc. Informatics — 09/2018 – Present

University of Edinburgh — Edinburgh, United Kingdom

- Expected graduation in August 2019
- Specialisation in Machine Learning and Autonomous Robotics
- DAAD (German Academic Exchange Service) graduate scholarship
- Modules include: Reinforcement Learning, Algorithmic Game Theory and its Applications, Machine Learning and Pattern Recognition, Robotics: Science and Systems, Decision Making in Robots and Autonomous Agents

B.Sc. Computer Science, minor subject Japanese — 10/2015 – 08/2018

Saarland University — Saarbrücken, Germany

- Degree classification: grade of 1.2 (German scale) equivalent to UK 1st class honours
- BSc thesis: Domain-Dependent Policy Learning using Neural Networks in Classical Planning
- Modules include: Automated Planning, Admissible Search Enhancements, Neural Networks: Implementation and Application, Information Retrieval and Data Mining, Software Engineering, Modern Imperative Programming Languages

Abitur - Secondary School — 08/2008 – 07/2015

Warndtgymnasium Geislautern, Völklingen — Geislautern, Germany

- Graduated Abitur 1.0 with examination subjects:
  Mathematics - 15, English - 12, Computer Science - 14, German - 15, History - 15
- Prices received:
  - Year's best student award of the Warndtgymnasiums Geislautern
  - Computer science and mathematics award 2015 of Saarland University

PROJECT EXPERIENCE

Autonomous Robot Localisation, University of Edinburgh — 09/2018 – 12/2018

Group Project for Robotics: Science and Systems Lecture

- Constructed a four-wheel differential steering mobile robot as group of three for autonomous localisation in a known environment using LEGO aside of technical components including a Raspberry Pi computer
- Implemented particle-filter localisation and obstacle avoidance based on IR and sonar sensors
- Robot successfully managed to navigate through the constructed arena, detect and communicate points of interest using light sensors and return back to its deployment location

Galaxy-based Search, University of Edinburgh — 09/2018 – 12/2018

Group Project for Natural Computing Lecture

- Implemented the Galaxy-based Search Algorithm (GbSA) and Particle Swarm Optimisation (PSO) baseline for PCA approximation as metaheuristic optimisation algorithms
- Evaluated and analysed GbSA and its foundational research paper, outlined limitations, proposed adjustments to the algorithm and showed their positive impact on performance in an evaluation

Plagiarism Detection Tool, Saarland University 04/2017 – 07/2017

Group Project for Software Engineering Lecture

- Researched, planned and built a reliable similarity detection for text & code in Python with language-specific analysis for Python and C as a group of five
- Designed and implemented a web-based output creation, highlighting similar submissions and plagiarism
- Our software is now successfully used in our customer's lectures to detect plagiarism cases on Python code

Concurrent CDCL SAT-Solver, Saarland University 07/2017 – 09/2017

Group Project for Modern Imperative Programming Languages Seminar

- Planned and implemented a concurrent Conflict-Driven Clause Learning SAT-Solver using Rust
- Optimised literal assignment using multiple heuristic strategies, pure variable detection and handling

RESEARCH

B.Sc. Dissertation, Saarland University 04/2018 – 07/2018

Foundations of Artificial Intelligence (FAI) Group

- Transferred domain-dependent policy learning neural network architecture of Action-Schema Networks to classical automated planning
- Implemented the network using Keras, slightly adjusted its training for classical planning and extended the FastDownward planning framework
- Extensive evaluation and analysis was conducted on IPC domains of varying complexity identifying limitations in generalisation and scalability
- Received best grade 1.0 twice of both reviewers

TEACHING EXPERIENCE

Voluntary Lecturer and Coach, Saarland University 09/2017 – 10/2017

Mathematics Preparation Course

- Assisted the organization of the mathematics preparation course for upcoming computer science students
- Explained importance of mathematics for CS, formal languages and predicate logic to $\sim$ 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

Programming 1 Teaching Assistant, Saarland University 10/2016 – 03/2017

Dependable Systems and Software Group

- Taught first-year students fundamental concepts of functional programming, basic complexity theory and inductive correctness proofs in weekly tutorials and office hours
- Corrected weekly tests as well as mid- and endterm exams
- Collectively created learning materials and discussed student progress as part of the whole teaching team

VOLUNTEERING

Navigation Team Member, University of Edinburgh 09/2018 – Present

HYPED – University of Edinburgh Hyperloop Society

- Working on navigation of Poddy III Hyperloop prototype including filtering data of IMUs and proximity sensors using Kalman filters to estimate location, orientation and speed of the pod
- Preliminary Design Briefing of Poddy III was approved by SpaceX for their 2019 Hyperloop competition

School Year Representative, Warndtgymnasium 08/2013 – 07/2015

- Elected committee member representing school year; involved in organisation of school events and sponsor negotiations

[References available on request - Last updated on 13th December 2018]