Robin Schmucker

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Profile

I am a PhD student working in the intersection of artificial intelligence and machine learning. My current focus is on problems related to intelligent tutoring systems including deep learning for student knowledge assessments and reinforcement learning for personalized curriculum design.

Education

Doctor of Philosophy, Candidate – Carnegie Mellon University — Since August 2018
Machine Learning
Related Coursework: Deep Reinforcement Learning, Advanced Machine Learning, Data Analysis, Intermediate Statistics, Convex Optimization, Graduate Artificial Intelligence
Advisor: Prof. Tom Mitchell

Master of Science – Carnegie Mellon University — August 2018 – May 2021
Machine Learning - Research
Advisor: Prof. Tuomas Sandholm and Prof. Tom Mitchell

Bachelor of Science – Karlsruhe Institute of Technology — October 2014 – March 2018
Computer Science & Minor Economics
Bachelor Thesis: Learning and Recognizing Activity Patterns with Sensor Data
Advisor: Prof. Manuela Veloso

Research & Work Experience

Applied Scientist Intern — February 2021 – April 2021 & May 2020 – August 2020
Berlin office, Amazon Web Services, Inc.
- Member of research group associated with Amazon SageMaker.
- Design of algorithms for automated hyperparameter optimization.
- Contribution of multi-objective optimization algorithms to open-source project AutoGluon.

Advisor: Michele Donini and Cédric Archambeau

Student Intern — September 2017 – March 2018
Machine Learning Department, Carnegie Mellon University
- Learning robot activity patterns based on sensor data of a real humanoid-like robot.
- Member of CMU's RoboCup2018 home robotics team.

Advisor: Prof. Manuela Veloso

Undergraduate Research Assistant — May 2017 – August 2017
Telecooperation Office, Karlsruhe Institute of Technology
- Development of a social media analysis framework and event detection algorithms for graphs.
- Analysis of data from Germany's largest Q&A website (Gutefrage.de).

Advisor: Simon Sudrich and Prof. Michael Beigl

Summer Internship — August 2014 - September 2014
Centre for Quantum Technologies, National University Singapore
- Verification of theoretical research results in an independent numerical simulation in Matlab.

Advisor: Prof. Stephanie Wehner

Summer Internship — August 2013 - September 2013
Centre for Quantum Technologies, National University Singapore
- Study of the visible effects of special relativity when traveling close to the speed of light.

Advisor: Prof. Artur Ekert and Prof. Stephanie Wehner

Robin Schmucker, rschmuck@cs.cmu.edu

Publications & Working Papers

- Yang Shi, **Robin Schmucker**, Tiffany Barnes, Min Chi, Thomas Price
  Automated Knowledge Component Discovery for Programming Problems
  Submitted to International Learning Analytics and Knowledge Conference (LAK), 2022.
- **Robin Schmucker**, Tom M Mitchell
  Transferable Student Performance Modeling for Intelligent Tutoring Systems
  Accepted at International Conference on Computers in Education (ICCE), 2022.
- **Robin Schmucker**, Jingbo Wang, Shijia Hu, Tom M Mitchell
  Assessing the Performance of Online Students - New Data, New Approaches, Improved Accuracy
  Journal of Educational Data Mining (JEDM), 2022.
- **Robin Schmucker**, Gabriele Farina, James Faeder, Fabian Fröhlich, Ali Saglam, Tuomas Sandholm
  Combination Treatment Optimization Using a Pan-Cancer Pathway Model
  PLOS Computational Biology, 2021.
- **Robin Schmucker**, Michele Donini, Muhammad Bilal Zafar, David Salinas, Cédric Archambeau
  Multi-Objective Asynchronous Successive Halving
  Submitted to Conference on Neural Information Processing Systems (NeurIPS), 2021.
- Valerio Perrone, Michele Donini, **Robin Schmucker**, Krishnaram Kenthapadi, Cédric Archambeau
  Fair Bayesian Optimization
  Conference on AI, Ethics, and Society (AIES), 2021.
- Gabriele Farina, **Robin Schmucker**, Tuomas Sandholm
  Bandit Linear Optimization for Sequential Decision Making and Extensive-Form Games
  AAAI Conference on Artificial Intelligence, 2021.
- **Robin Schmucker**, Michele Donini, Valerio Perrone, Muhammad Bilal Zafar, Cédric Archambeau
  Multi-Objective Multi-Fidelity Hyperparameter Optimization with Application to Fairness
  NeurIPS Workshop on Meta-Learning, 2021.
- Gabriele Farina, **Robin Schmucker**, Tuomas Sandholm
  Counterfactual-Free Regret Minimization for Sequential Decision Making and Extensive-Form Games
  Workshop on Reinforcement Learning in Games (AAAI-RLG), 2020.
- Michiel de Jong, Kevin Zhang, Travers Rhodes, Aaron Roth, **Robin Schmucker**, Chenghui Zhou, Sofia Ferreira, João Cartucho, Manuela Veloso
  Towards a Robust Interactive and Learning Social Robot
  International Conference on Autonomous Agents and Multiagent Systems (AAMAS), 2018.
- **Robin Schmucker**, Chenghui Zhou, Manuela Veloso
  Multimodal Movement Activity Recognition Using a Robot's Proprioceptive Sensors
  RoboCup Symposium, 2018.
- C. Pfister, J. Kaniewski, M. Tomamichel, A. Mantri, **R. Schmucker**, N. McMahon, G. Milburn, S. Wehner
  A Universal Test for Gravitational Decoherence
  Nature Communications 7, 13022, 2016.

Teaching

2022 Teaching Assistant for **Deep Reinforcement Learning & Control** (Carnegie Mellon University)

2020 Teaching Assistant for **Convex Optimization** (Carnegie Mellon University)

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Community Service

Since 2022	Mentor, CMU undergraduate AI mentoring program
Since 2019	MLD retreat committee, organization of social events for the department
2021	MLD PhD admission committee
2017 – 2018	Press team, German network for young scientists (JuForum)
2016	Block representative, Dormitory Waldhornstraße 36, Karlsruhe

Computer Skills

Languages	Python, C++, Java, JavaScript
Operating systems	Linux, Windows, macOS
Other	PyTorch, Sklearn, ROS, SQL, Matlab

Languages

German	Native speaker
English	Fluent
Spanish	Basic

Scholarships & Awards

2017 **CLICS-Scholarship** – Karlsruhe Institute of Technology
Selected for 6-month long student exchange program.

2014 – 2018 **KIISS-Scholarship** – Karlsruhe Institute of Technology & Robert Bosch GmbH
Selected for Karlsruhe's Informatics-Industry-Scholarship

2014 – 2018 **Society for Gifted Students** – Karlsruhe Institute of Technology

2015 **Ferry-Porsche-Scholarship** – Porsche AG

2014 **2nd Place Youth Research Competition** – Baden-Wuerttemberg
Project: Visualization of special relativity
Category: Mathematics / Informatics