

Emil Carlsson

PhD-student

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Research Interests

I'm interested in online learning, decision-making under uncertainty, computational learning theory and communication in multi-agent reinforcement learning.

Education

- 2019- Ph.D. Computer Science, Chalmers University of Technology, Sweden.
Advisor: Prof. Devdatt Dubhashi.
- 2017-2019 M.Sc Mathematics, Chalmers University of Technology, Sweden.
- 2014-2017 B.Sc Mathematics, Chalmers University of Technology, Sweden.

Research Visits and Exchanges

- 2022-2023 Visiting Researcher, UC Berkeley, US.
Host: Prof. Terry Regier.
- 2017-2018 Exchange Student at the Informatics department, Technische Universität München, Germany.

Publications

Under Review

Emil Carlsson, Debabrota Basu, Fredrik D. Johansson, Devdatt Dubhashi. Pure Exploration in Bandits with Linear Constraints. *Under review. Earlier version presented at the European Workshop for Reinforcement Learning 2023.*

Peer-reviewed Journal Articles

Newton Mwai Kinyanjui, Emil Carlsson, Fredrik D Johansson, Fast Treatment Personalization with Latent Bandits in Fixed-Confidence Pure Exploration. TMLR 2023.

Mikael Kågeback, Emil Carlsson, Devdatt Dubhashi, Asad Sayeed. A reinforcement-learning approach to efficient communication. *Plos one* 15 (7), 2020.

Peer-reviewed Conference Contributions

Emil Carlsson, Devdatt Dubhashi, Terry Regier. Iterated learning and communication jointly explain efficient color naming systems. Proceedings of the Annual Meeting of the Cognitive Science Society 45, 2023. Poster presentation.

Emil Carlsson, Devdatt Dubhashi. Pragmatic Reasoning in Structured Signaling Games. Proceedings of the Annual Meeting of the Cognitive Science Society 44, 2022. Poster presentation.

Emil Carlsson, Devdatt Dubhashi, Fredrik D. Johansson. Learning Approximate and Exact Numeral Systems via Reinforcement Learning. Proceedings of the Annual Meeting of the Cognitive Science Society, Volume 43, 2021. Oral presentation (Acceptance rate: 14.8%).

Emil Carlsson, Devdatt Dubhashi, Fredrik D. Johansson. Thompson Sampling for Bandits with Clustered Arms. Proceedings of the Thirtieth International Joint Conference on Artificial Intelligence (IJCAI), 2212-2218, 2021. Poster presentation (Acceptance rate: 13.9%).

Workshop Contributions

Emil Carlsson, Debabrota Basu, Fredrik F. Johansson, Devdatt Dubhashi. Pure Exploration in Bandits with Linear Constraints. *European Workshop for Reinforcement Learning 2023*.

Erik Jergéus, Leo Karlsson Oinonen, Emil Carlsson, Moa Johansson. Towards Learning Abstractions via Reinforcement Learning. AIC 2022, 8th International Workshop on Artificial Intelligence and Cognition.

Thesis

Efficient Communication via Reinforcement Learning, Licentiate Degree.
Opponent: Prof. Noah D. Goodman, Stanford University, US.

Employment

2019 Data Scientist at 1928 Diagnostics.

Developed and implemented novel machine learning methods to enhance the quality of antibiotic resistance predictions.

2017 Intern at Volvo GTT.

Worked on software for automatic data annotation.

2016 Industrial worker at SKF.

2014-2015 Caretaker at Backagården short-term accommodation for children with autism.

Grants

2022-2023 Fellowship Sweden-America foundation.

The Sweden-America foundation promotes exchange of scientific, cultural, and practical experiences through presenting fellowships to young men and women for research and graduate level studies in the United States and Canada. The foundation is under the patronage of the King of Sweden, Carl XVI Gustaf.

Talks (selected)

- 2022 Seminar at CLASP, Göteborgs Universitet.
Pragmatic Reasoning and Efficiency.
- 2021 Vetenskapsfestivalen (Science festival), Göteborg.
Language learning and Reinforcement Learning
- 2021 Seminar at the Language & Cognition Lab, UC Berkeley.
Learning Approximate and Exact Numeral Systems via Reinforcement Learning.
- 2023 Seminar at UC Berkeley.
Neural Iterated Learning and Efficiency.

Misc

- 2021 Member of the CSE PhD Council at Chalmers University.
The council acts as the voice of the PhD students in various meetings with faculty and head of department. The main goal is to highlight questions regarding the well-being of PhD students.
- 2019-2021 Organizer of Chalmers Machine Learning Seminar.
A weekly seminar with both local and international speakers.

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