

Rickard K.A. Karlsson

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Research Interests: Machine Learning, Causal Inference, Statistics

Education

- Expected 2025 **Ph.D. Computer Science** at Delft University of Technology, the Netherlands.
Dissertation topic: Causal machine learning
Advisors: Jesse H. Krijthe & Marcel Reinders
- 2021 **M.Sc. Engineering Mathematics** at Chalmers University of Technology, Sweden.
Thesis: Learning using privileged time-series
Advisor: Fredrik D. Johansson
Exchange: Delft University of Technology during spring semester 2020
- 2019 **B.Sc. Engineering Physics** at Chalmers University of Technology, Sweden.
Thesis: Event reconstruction of gamma-rays using neural networks
Advisor: Andreas M. Heinz
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Work Experience

- 01/2021–06/2021 **Chalmers University of Technology** – Gothenburg, Sweden.
Graduate Student Researcher
Studied learning algorithms for long-term predictions, particularly focusing on understanding how to improve sample efficiency in a healthcare setting. Led to first-author paper at AISTATS 2022. Supervised by Fredrik D. Johansson.
- 07/2020–12/2020 **Apro Translation AB** – Gothenburg, Sweden.
Software Developer Consultant
Developed a Java program to automate order confirmation and other time-consuming computer tasks at the company. This allowed the company to accept new translation jobs with much higher success rate as jobs arrive on a "first come, first served" basis.
- 07/2020–09/2020 **Delft University of Technology** – Delft, the Netherlands.
Research Assistant
Worked on black-box optimization using surrogate models. Resulted in two research papers, one of them with me as first-author, and winning a competition at GECCO 2021. Supervised by Laurens Bliek.

- 06/2019–08/2019 **NASA Goddard Space Flight Center** – Greenbelt, Maryland, USA.
Data Analyst Intern
Developed specialized data visualization software in Python for very-long-baseline interferometry (VLBI) data with both a graphical and terminal-based interface.
- 01/2019–06/2019 **Chalmers University of Technology** – Gothenburg, Sweden.
Undergraduate Student Researcher
Developed deep learning models in TensorFlow to improve analysis of data from high-energy subatomic physics experiments. Supervised by Andreas M. Heinz.
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Teaching Experience

- 2022 – Machine Learning 1 (MSc level) at TU Delft.
Teaching assistant.
- 2022 – Machine Learning 2 (MSc level) at TU Delft.
Teaching assistant & practice leader.
- 2020 Computational Methods in Bioinformatics (MSc level) at Chalmers Univ. of Tech.
Teaching assistant.
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Supervisions

- 2022 *Stelios Avgousti, Christof Goedhart, Hendy Liang, David van der Maas, Noyan Toksoy*
Thesis topic (BSc level): Predicting Outcomes in Dota 2 using Causal Inference
- 2022 *Zenan Guan, Jeroen Hoefland, Jochem van Lith, Anxian Liu*
Thesis topic (BSc level): Out-Of-Domain Generalization with Invariant Predictors
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Awards & Scholarships

- 2021 1st place on the GECCO 2021 Industrial Challenge (limited evaluation track).
- 2020 Recipient of the Royal & Hvitfeldtska Foundation scholarship for my academic performances.
- 2018 Awarded for best experimental work in physics among more than 110 physics students.
- 2017 Recipient of the Adlerbetska Foundation scholarship for my academic performances during the first year of my bachelors studies.

Extracurriculars and volunteering

2022 – present	Co-organizer in Effective Altruism Delft
2020 – 2021	Co-organizer in university chapter of Engineers Without Borders Sweden
2018 – 2019	Board member at Cremona Chalmers AB (university bookshop)
2018 – 2019	President of Chalmers Engineering Student Internship Program (CESIP)

Languages & Tools

Languages	Swedish (native), English (fluent), Polish (intermediate), Dutch (intermediate)
Programming	Python, R, C, Java, PyTorch, TensorFlow, Git, Docker, Kubernetes

Publications

Full list of publications also available on Google Scholar ([link](#)).

Conference

- 2022 Karlsson, R., Willbo, M., Hussain, Z. M., Krishnan, R. G., Sontag, D., and Johansson, F. D. Using time-series privileged information for provably efficient learning of prediction models. In *International Conference on Artificial Intelligence and Statistics* (2022), PMLR, pp. 5459–5484
- 2020 Karlsson, R., Blik, L., Verwer, S., and Weerdt, M. d. Continuous surrogate-based optimization algorithms are well-suited for expensive discrete problems. In *Benelux Conference on Artificial Intelligence* (2020), Springer, pp. 48–63

Preprint

- 2022 Karlsson, R., and Krijthe, J. H. Detecting hidden confounding in observational data using multiple environments. *arXiv preprint arXiv:2205.13935* (2022)
- 2021 Blik, L., Guijt, A., Karlsson, R., Verwer, S., and de Weerdt, M. Expobench: Benchmarking surrogate-based optimisation algorithms on expensive black-box functions. *arXiv preprint arXiv:2106.04618* (2021)

Extended Abstract / Short Papers

- 2022 Blik, L., Guijt, A., and Karlsson, R. Hospital simulation model optimisation with a random relu expansion surrogate model. In *Proceedings of the Genetic and Evolutionary Computation Conference Companion* (2021), pp. 13–14

Theses

- 2021 *Learning using Privileged Time-Series*, Chalmers University of Technology.
2019 *Event reconstruction of gamma-rays using neural networks*, Chalmers University of Technology.

References

Available upon request.

[CV last updated on February 3, 2023]