Curriculum Vitae
Rickard Karlsson

Education

2021 – 2025 **Ph.D. Computer Science** at Delft University of Technology, the Netherlands.
Dissertation topic: Model evaluation and validation in causal inference
Advisors: dr.ir. Jesse H. Krijthe & prof.dr.ir. Marcel Reinders

2019 – 2021 **M.Sc. Engineering Mathematics** at Chalmers University of Technology, Sweden.
Specialization: Statistics & machine learning
Thesis project: Learning using privileged time-series
Exchange semester: Delft University of Technology (spring 2020)

2016 – 2019 **B.Sc. Engineering Physics** at Chalmers University of Technology, Sweden.
Thesis project: Event reconstruction of gamma-rays using neural networks

---

Previous Research Projects

List of publications can be found at the end of the CV.

01/2021–06/2021 **Chalmers University of Technology** – Gothenburg, Sweden.
Master Thesis Project (Supervisor: dr. Fredrik D. Johansson)
Studied how to use data that is only available during training time of a predictive model and not at test time to improve sample efficiency for long-term predictions. Proved that there are finite-sample theoretical guarantees for when using such data leads to improvements and worked on a case study of modeling disease progression for Alzheimer's disease and Multiple Myeloma. Led to first-author paper at AISTATS 2022 in collaboration with the MIT Clinical ML lab.

07/2020–09/2020 **Delft University of Technology** – Delft, the Netherlands.
Part-Time Research Assistant (Supervisor: dr. Laurens Bliek)
Studied black-box optimization using surrogate models by analyzing & comparing different classes of methods for discrete variable problems. I also helped develop an open-source benchmark for testing these methods. My findings resulted in two research papers, one of them with me as first-author, and I was also involved in winning a competition about optimization at GECCO 2021.

01/2019–06/2019 **Chalmers University of Technology** – Gothenburg, Sweden.
Bachelor Thesis Project (Supervisor: prof.dr. Andreas M. Heinz)
Developed deep learning models in TensorFlow for analysis of data from high-energy subatomic physics experiments. Our method showed better performance than the current state-of-art for higher gamma-ray energies of 3.5 to 10 MeV.

Work Experience

07/2020–12/2020 **Apro Translation AB** – Gothenburg, Sweden.
Software Developer Consultant (part-time during studies)
Developed a program in Java 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 they now could instantly accept new jobs that arrive on a "first come, first served" basis.

06/2019–08/2019 **NASA Goddard Space Flight Center** – Greenbelt, Maryland, USA.
Data Analyst Intern
Developed data visualization software in Python for very-long-baseline interferometry (VLBI) data with both a graphical and terminal-based interface. This tool helped VLBI scientists with more easily spotting anomalies in their data.

Teaching & Supervision

Courses

2022 – present Machine Learning 2 (MSc level) at TU Delft.
Guest lecture on "Causal Machine Learning" and developing course material on causality.

2022 – present Machine Learning 1 (MSc level) at TU Delft.
Teaching assistant.

2020 Computational Methods in Bioinformatics (MSc level) at Chalmers Univ. of Tech.
Teaching assistant.

Supervised projects

2022 *Stelios Avgousti, Christof Goedhart, Hendy Liang, David van der Maas, Noyan Toksoy*
Bachelor Thesis Project: Predicting Outcomes in Dota 2 using Causal Inference

2022 *Zenan Guan, Jeroen Hoefland, Jochem van Lith, Anxian Liu*
Bachelor Thesis Project: Out-Of-Domain Generalization with Invariant Predictors

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 independent project in experimental physics course among more than 110 students.
2017	Recipient of the Adlerbetska Foundation scholarship for my academic performances during the first year of my bachelors studies.

Extracurriculars and volunteering

2022 – 2023	Co-organizer in Effective Altruism Delft
2020 – 2021	Co-organizer in university chapter of Engineers Without Borders Sweden
2018 – 2019	Board member at university bookshop Cremona Chalmers AB
2018 – 2019	President of Chalmers Engineering Student Internship Program (CESIP)

Skills

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., Bliek, 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 Bliek, 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 Bliek, 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.

[CV last updated on April 5, 2023]