

Daniel Holmberg

PhD Student

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Experience

PhD Student

Finnish Center for Artificial Intelligence

August 2022 – present Helsinki, Finland

- Develop ML algorithms able to detect signatures of magnetic reconnection in Vlasov based simulations of Earth's magnetosphere
- Includes some teaching work, now TA in Introduction to Data Science

Technical Student

CERN

July 2021 – June 2022 Geneva, Switzerland

- Built end-to-end cloud native ML pipelines with Kubeflow
- Developed scalable particle physics usage samples
- Optimized models with Katib AutoML
- Served ONNX models over http with Nvidia Triton

Software Engineer

Fjuul Vision Oy

March 2020 – March 2021 Helsinki, Finland

- App development on Google Cloud Platform with Node.js and React
- Integrated the Withings tracker as an activity source
- Implemented OAuth handshakes, API subscriptions as well as data tables with Terraform

Research Assistant

Helsinki Institute of Physics

Nov 2020 – Jan 2021 Helsinki, Finland

- Researched how jet energy corrections can be performed using graph neural network regression under the guidance of Dr. Henning Kirschenmann and Associate Prof. Mikko Voutilainen
- Participated in Fermilab's CMS data analysis school

Publications

- A. Ovaska, E. Rauth, **D. Holmberg**, et. al. *Models for accumulation mode particle concentrations using machine learning and reanalysis data*. To be presented at IAC 2022.
- P. Kuopanportti, M. Ropo, **D. Holmberg**, et. al. *Interatomic Fe-Cr potential for modeling kinetics on Fe surfaces*, *Computational Materials Science* journal (2022), doi: 10.1016/j.commatsci.2021.110840.

Education

M.Sc. Data Science

University of Helsinki

2020 – 2022

- Thesis: *Jet Energy Corrections with Graph Neural Network Regression*
- Thesis awarded 5/5, GPA 4.3/5

B.Sc. Physics

University of Helsinki

2016 – 2019

- Thesis: *Interatomic Potentials for Simulating Fe-Cr*
- Thesis awarded 4/5, GPA 4.3/5

Organizations

Managing Editor

Spektrum rf

2021

- Oversee student paper publication process
- Wordpress admin for the website spektrum.fi/spektraklet

Vice-Chairman

Nyland Brigade Conscript Committee

2018

- Hosted meetings for conscript representatives and officers to discuss current affairs at the brigade
- Arranged working life events and a study fair with some 20 universities and polytechnics

Skills

Python Kubeflow Bash JavaScript
Git PyTorch TensorFlow Docker

Data Analysis Computational Physics
Machine Learning Teamwork

Highlights

Speaker

KubeCon + CloudNativeCon Europe 2022

📅 May 2022

- Talk about scalable cloud native ML pipelines for particle physics

🔗 kccnceu2022.sched.com/event/ytqv

Speaker

Learning to Discover @ Institut Pascal Paris-Saclay

📅 April 2022

- Talk about calibrating particle jets' energy with GNN regression

🔗 indico.ijclab.in2p3.fr/event/5999/timetable/32-jet-energy-corrections-with

Kubeflow Facilitator

CMS ML Hackathon

📅 November 2021

- Helped phycisists run deep learning workflows as scalable jobs on cern's internal cloud resources
- Developed hyperparameter-tuning configuration files for Kubeflow

Helper

CodeRefinery

📅 May – June 2020

- Participant of the June 2020 CodeRefinery instructor training
- Helper at the first online mega-CodeRefinery workshop

Languages

Swedish: Native, C2

English: Fluent, C1

Finnish: Intermediate, B1

German: Elementary, A1

Hobbies

I like to run and I also play some football every now and then. I've participated in a couple of sports events over the years and more to come.

- Helsinki Midnight Run 2022
- Football with CERN FC 2021-2022
- Futsal with Spektrum FC 2019-2021
- Anchor - Jukola Orienteering Relay 2019
- Baltic Sea Half Marathon 2019