Mikk **Kruusalu**

Machine learning · Physics · Numerical modelling

53030327 kruusalu.mikk@gmail.com https://mikruu.ee mikk-kruusalu Mikk Kruusalu

About

I am an **active** person with a healthy lifestyle and value great work ethics, honesty and accuracy. I believe in **science** and **innovative green technologies**. I like to solve problems and I am open to any new challenges. Since I have actively played **football** for most my life, I enjoy **good teamwork** and an **ambitious environment**.

Projects

Implementing PaiNN

Course project in DTU — MrCogito/Deep_learning_2023

State of the art graph neural network architecture for predicting physical properties of molecules being much faster than conventional methods.

Robotex

- Competed in line following, water rally, maze solving, folkrace. I have won also a few prizes.
- Building robots involved 3D modelling, custom PCBs, also algorithmic thinking and programming in C.

Deep learning

Course project — mikk-kruusalu/deep_learning_project

Implementations of different architectures such as CNN, RNN, GAN, VAE, PINN

Nerve signal modelling

Bachelor thesis — mikk-kruusalu/heimburg_jackson

I used Jax for analysing nonlinear dispersive wave phenomena in nerve axons. Learned about the electrophysiology of nerve signals.

Graph topology optimisation

Course project — https://mikruu.ee/assets/power-grid-optimisation.pdf

I analysed what is the optimal topology for a small scale deployable power grid to be tolerant for node attacks while delivering the most power.

Skills

Languages **Estonian**, English (C1)

Programming **Python** -- Jax, Pytorch, Scipy, Numpy, Scikit-learn, Sktime, LaTeX, Git, Julia, Rust, R, C++

Programs Autodesk Fusion 360, Kicad, OpenFOAM, ElmerFEM, Paraview

Education

MSc Applied Physics and Data Science

TalTech — Sep 2024 - Present

- Mathematical Modelling, Machine learning, Deep Learning, Numerical methods

Erasmus exchange student

Denmark University of Techonolgy — Sep 2023 - Jan 2024

- Dynamical Systems, R, Deep learning, State Space Models

BSc Applied Physics

TalTech, Cum laude — Sep 2021 - June 2024

- Thesis – modelling nerve signal propagation in an axon
- Mathematical modelling, Physics, Probability and Statistics

Experience

Development Engineer

CAFA Tech — Mar 2023 - Present

- Energy Team Lead in developing a small-scale microgrid.
- Machine learning model for classifying objects based on their trajectories.
- Developed a Data Acquisition System based on Beckhoff PLC and Timescale database.
- Rapid prototyping of heat engines.
- Developed a battery pack control system PCB and firmware.
- Drone tether system control loop firmware.

Robot Technician

Starship Technologies — June 2022 - Feb 2023

- Repaired mechanics and electronics including PCBs
- Create tools to improve the robot's repair process

Bike mechanic

Hawaii Express — June 2021 - Sep 2021