



# Joona Kareinen

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## Education

LUT University, Lappeenranta, Finland July 2024 – Present

D.Sc. in Technology, Computer Vision and Pattern Recognition

- Focus: plankton recognition, open-set recognition, and domain adaptation and generalization

LUT University, Lappeenranta, Finland

Sept 2022 – June 2024

M.Sc. in Technology, Data-Centric Engineering

GPA 4.88/5

- Focus: Machine Learning, Computer Vision, Data-Analytics,
- Thesis: Open-set plankton detection

LUT University, Lappeenranta, Finland

Sept 2019 – Sept 2022

B.Sc. in Technology, Computational Engineering

GPA 4.38/5

- Thesis: User interface for Saimaa ringed seal re-identification
- The thesis implemented a web UI using React for a novel animal re-identification method

## Work Experience

### Quantum Technologies Trainee

CSC - IT Center for Science – Espoo, Finland

May 2023 – Aug 2023

- Installed CUDA-accelerated quantum simulators onto two High-Performance Computing (HPC) systems
- Developed performance benchmarks for CUDA acceleration, focusing on simulation speed and resource use
- Achieved a 10x speedup in quantum simulation performance compared to the CPU implementation

### Part-time Teacher in Mathematics

LUT University – Lappeenranta, Finland

Mar 2023 - Apr 2023

- Assisted students in solving linear/nonlinear equations, differential equations, optimization problems, integration, and data fitting using MATLAB

### Part-time Teacher in Mathematics

LUT University – Lappeenranta, Finland

Sep 2021 - May 2022

- Provided exercise group tutoring for *Differential Equations*, *Mathematics III*, and *Differential Calculation* courses
- Instructed students on the practical application of MATLAB for differential equations and to understand eigenvalues and eigenvectors

## Projects

### Open-set plankton detector

 [github.com/Jookare/open-set-plankton-detector](https://github.com/Jookare/open-set-plankton-detector)

- Implemented a two-part system for open-set plankton detection with Faster R-CNN object detector implemented using PyTorch and OpenCV and three advanced open-set recognition methods
- Achieved open-set accuracy of 93% using 12 known classes and 8 unknown classes

## Skills

**Software skills:** Python, PyTorch, Keras, NumPy, Pandas, OpenCV, MATLAB, React, Next.js, JavaScript, HTML, CSS, Node.js, C, C++, CUDA, MPI, OpenMP

**Language skills:** Finnish, English, Japanese (basics)