Joona Pohjonen
+358 449868806
https://jopo666.com
me@jopo666.com

Machine Learning Engineer with 5 years of specialized experience in designing, deploying, and scaling robust, production-grade ML pipelines for digital pathology.

Machine Learning Engineer | Aiforia Technologies | 2023 – Present

- Independently engineered the company's next-generation ML pipeline from scratch in Python and PyTorch, replacing a legacy C++ system. This drove a significant reduction in clinical model errors, model training time and manual annotation requirements, through a combination of state-of-the-art methods, advanced augmentation strategies, and pipeline optimizations.
- Reduced the pixel-level error of multiple production clinical models by 5-10x. The company’s flagship production Gleason grading model error on unseen data was reduced from 15% to 2.72%, without lowering model throughput.
- Achieved orders of magnitude faster training times and reduced manual annotation requirements by 2-5x, enabling rapid model iteration and faster time-to-market for new clinical products.
- Authored a pending patent based on the high-performance ML pipeline architecture.
- Provided technical leadership and mentorship to company’s model development team and pathologists on annotation strategy, data augmentation, and hyper-parameter tuning.
- Deployed models into company’s multi-cloud (Azure, GCP, AWS) Kubernetes-based production infrastructure operating under ISO-27001 certification.

Doctoral Researcher | University of Helsinki | 2020 – 2023

- Secured and managed a 1 million GPU-hour grant on the LUMI supercomputer to train a large-scale foundation model for digital pathology, leveraging slurm, singularity, and AMD's ROCm platform.
- Optimized computationally-intensive data processing workloads by implementing critical components in Rust.
- Researched and implemented novel methods for neural network generalization by addressing the key domain shift problem between medical centers.

Technical Consultant | Dustin Finland Oy | 2011 – 2015

- Designed and led large-scale network implementations for hospital and municipal clients, including the City of Helsinki (500+ schools) and Jorvi Hospital in Finland.

Education

- Doctor of Science | Machine learning | University of Helsinki | 2020 – Present
- Master of Science | Bioinformatics | University of Helsinki | 2018 – 2020
- Bachelor of Science | Biology | University of Helsinki | 2016 – 2018
- Bachelor of Engineering | Network systems | Metropolia UAS | 2011 – 2015

Technologies

- Languages: Python (expert), Rust, Zig, C#, Go, TypeScript, Finnish, English
- Libraries: PyTorch (expert), NumPy, OpenCV, React, OpenTelemetry, RabbitMQ
- MLOps/Devops: Kubernetes, Docker, Signularity, Slurm, Git, CI/CD, Monitoring

Selected publications and open-source projects

- Digital pathology foundation model for prostate cancer. [github, arxiv]
- Domain shift testing and augmentation strategy for medical imaging AI. [github, arxiv]
- Spectral decoupling makes medical imaging AI more transferable. [arxiv]
- HistoPrep: Prepare pathology slide images for machine learning pipelines. [github]

References provided on demand