Roman Knyazhitskiy

✉ cv@knyaz.tech — 🌐 knyaz.tech — ⚫ knyazer

Summary

Software Engineer and Machine Learning Researcher specializing in C++ and Python, with extensive experience in Generative AI (LLMs) and Reinforcement Learning. Proven track record of building scalable end-to-end ML systems, optimizing infrastructure, and developing accessible technologies. Expertise in JAX, algorithms, and sequential decision-making logic.

Education

MPhil in MLMI (Machine Learning), University of Cambridge   10/2025 - 09/2026

BSc Computer Science and Engineering, TU Delft   09/2022 - 07/2025
- GPA: 8.7/10. Distinction (Cum Laude, top 5%) + Honours.

Work Experience

Machine Learning Engineer (Lead), Delft Mercurians   05/2023 - 09/2025
- Led the control team, focusing on sequential decision making and real-time optimization.
- Built a JAX+Equinox differentiable simulator, integrating Python models into a Rust/C++ codebase.
- Designed Model Predictive Control (MPC) systems for trajectory optimization.

Research Associate, TU Delft   03/2023 - 08/2025
- Investigated Prior-Data Fitted Networks (PFNs) for meta-learning and HPO.
- Researched applicability of LLMs for vulnerability detection and code generation.

Applied Machine Learning Intern, Central Robotics Institute   06/2021 - 07/2021
- Implemented image segmentation and processing logic for path planning over image edges.

Selected Projects

Bootstrapped DQN Scaling Laws (Reinforcement Learning), JAX, Deep RL   2025
- Conducted large-scale empirical study of ensemble-based exploration in Deep RL.
- Engineered high-performance training infrastructure supporting 40,000+ configurations.

Automatic Item Selling & Haggling, PyTorch, LLMs   2025
- Built a system for automatic placement of the adverts on a marketplace from a photo of the item.
- Used a chain of LLM/VLM calls, some processing and automatic interaction with a web UI.
- Implement an integration that allows the system to haggle with buyers until the best price is reached.
- The same system was later built by the marketplace itself, probably driving some revenue.

Implicit Neural Representations, Python, JAX, Computer Vision   2024
- Developed a framework for training memory-efficient INRs for image compression.
- Implemented end-to-end training pipelines with multi-GPU sharding and automatic batch scaling.
- Published as a workshop paper on ICLR.

Silver-qt: Sign Language Recognition (Accessible Tech), Python, ONNX, CV   2019
- Developed a real-time sign language platform recognition using YOLOv5 and LSTMs.
- Deployed several models using ONNX Runtime, integrating with a PyQt5 GUI.

Literature Search Engine Startup (CTO), Python, LLM, BERT, Search   2024
- Architected a recommendation and search system using fine-tuned BERT models and LLM-based scoring.
- Implemented embedding-based retrieval and keyword filtering to rank scientific papers.

Honours, Awards, Contributions

- **1st Place**, Bunq Hackathon 6 (2025) – €30,000 prize.
- **2nd Place**, Epoch AI Hackathon (2024).
- **Best Software Solution**, RoboCup World Championships (2019).
- **Silver Medal**, AIIJC International AI Competition – Sign language recognition application.
- **Open Source:** Contributed to jaxtyping, Equinox, and Gymnax (RL environments). Improved stability in libccd (C++ collision detection).