Roman Knyazhitskiy

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Summary

Incoming MPhil student at the University of Cambridge with a track record in AI research and software engineering. My experience spans machine learning, computer vision, and robotics. I am passionate about developing innovative, high-impact solutions and aim to contribute to cutting-edge research and development teams.

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: 9/10. Graduated with Honours.

Work Experience

Head of AI, Delft Mercurians (Student Robotics Team) 05/2023 - Present (Part-Time)

- Led a team of 3 engineers in developing AI control systems for RoboCup competitions.
- Designed and implemented a Model Predictive Control (MPC) system for robot trajectory optimization, significantly enhancing path-following accuracy and tactical execution.
- Spearheaded the creation of a continuous-time, differentiable simulator in JAX, providing the foundation for the implementation of more efficient learning algorithms.
- Ensured AI solution robustness via CI/CD, runtime type checking, and a comprehensive test suite.

Software Engineer, Delft Mercurians (Student Robotics Team) 05/2023 - 10/2023

- Developed a sensor fusion toolkit for our wheeled platform, leading to more accurate Kalman Filter calibration.
- Analyzed past movement data to establish sensor fusion performance benchmarks and improve system reliability.

Honours and Awards

- **1st Place**, Bunq Hackathon 6 (2025), against 50+ teams with a prize of €30,000.
- **2nd Place & Special Prize**, Epoch AI Hackathon (2024).
- **'Best Software Solution'** award, RoboCup World Championships, Sydney (2019).
- **1st Place**, RoboCup Junior National Competitions (2017, 2018, 2019).

Open Source Contributions

- Enhanced functionalities in jaxtyping and Equinox, resolving multiple issues and enabling IPython runtime type checking.
- Currently (as of 2025) a semi-official maintainer of Gymnax - a widely used JAX RL environments collection, with 800 stars on GitHub.

Publications

Luijmes, J., Gielisse, A., **Knyazhitskiy, R.**, van Gemert, J. (2025). "ARC: Anchored Representation Clouds for High-Resolution INR Classification". *arXiv preprint arXiv:2503.15156*.

- Accepted for presentation at the ICLR 2025 Workshop on Weight Space Learning.

Skills

- **Machine Learning:** PyTorch, JAX, Equinox, HuggingFace, OpenCV, scikit-learn, W&B
- **Programming:** Python, Rust, C/C++, Java, SQL, HTML/CSS/JS
- **DevOps & Tools:** Git, GitHub Actions (CI/CD), Docker, JIRA, Ruff, Flake8
- **Languages:** English, Russian