

Mikolaj Duchlinski

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ABOUT ME

As an Artificial Intelligence graduate from Vrije Universiteit Amsterdam, with a minor in Electronics for Robotics from TU Delft, I am interested in domains where intelligent algorithms meet physical hardware. My academic background combines theoretical and applied AI – designing evolutionary algorithms for optimization problems, training reinforcement learning models, and building neural networks – with a solid foundation in electrical engineering and an understanding of hardware limitations. I am just as comfortable writing clean code as I am soldering components, reading component datasheets, and 3D-printing custom drone frames for physical prototypes. Python is currently my strongest language, and I am actively advancing my proficiency in C++.

Beyond my technical expertise, I do have a strong international and operational foundation, thanks to the Propedeuse in Business & Event Management and an academic exchange semester in Spain. I am actively seeking a full-time engineering role where I can apply my knowledge to real-world projects and gain enterprise experience in software deployment. Since graduating this summer, I have also begun studying advanced robotics, control systems engineering, and computer vision with deep learning in my free time.

SKILLS

Hardware & Electronics: VHDL, FPGA (Artix-7), AMD Vivado, Circuit Analysis, Power Electronics, Battery Management, Finite State Machines, Hardware Assembly, 3D Printing, Raspberry Pi 5

Software & Systems: Python (OOP, APIs), C/C++ (improving), Linux, Docker, Git/GitHub, SSH, Slurm/HPC

AI & Robotics: PyTorch, Reinforcement Learning (PPO), Evolutionary Algorithms (NSGA-II), Stable-Baselines3, Deep Learning

Data & Web: Flask, RESTful APIs, SQL, SQLite, Pandas, NumPy, JavaScript/HTML/CSS

PROJECTS

Autonomous Drone Navigation & Hardware Deployment

Independent Project | Vrije Universiteit Robotics Lab | Jul 2026 - Current

- Building a 3- and 5-inch quadcopter from scratch to establish a full physical hardware deployment pipeline.
- 3D-printing the drone's frame; integrating an onboard Raspberry Pi running pre-trained PPO models in real time for autonomous flight navigation, validated against an OptiTrack motion-capture system.

Key Technologies: Raspberry Pi, Python, Real-Time RL Inference, Flight Controllers, 3D Printing, OptiTrack

Autonomous Solar-Powered Mars Rover

Hardware Systems Project | TU Delft | Nov 2025 - Jan 2026 | Grade: 8.5/10

- Designed and synthesized a complete digital control system in VHDL on an AMD Xilinx Artix-7 FPGA to navigate an autonomous mobile robot.
- Engineered a physical power system: buck converter, supercapacitor energy buffer, solar panel array, and a custom analog Schmitt-trigger comparator.

Key Technologies: VHDL, AMD Vivado, FPGA (Artix-7), FSM Design, PWM Control, Power Electronics

Power-Aware Co-Optimization of Unconventional Hexacopters via Evolution and Learning

Bachelor Thesis | VU Amsterdam | Apr-Jun 2026 | Grade: 8.5/10 (15 ECTS)

- Designed a bi-objective evolutionary framework (NSGA-II) co-optimizing hexacopter morphology and PPO-trained neural flight controllers in PyTorch.
- Ran parallelized evolutionary compute across a 192-core cluster; achieved up to 31.6% lower energy consumption while retaining 95.7% of baseline flight performance.

Key Technologies: Python, PyTorch, PPO, NSGA-II, Battery Physics Modeling, HPC Cluster

Pulse - Personalized Content Feed Platform

Applied Programming for AI | VU Amsterdam | Jun 2026 | Grade: 8.5/10

- Architected a full-stack content feed platform (Python/Flask, SQLite) with RESTful JSON APIs and a custom NLP ranking engine.
- Wrote 325 unit/integration tests (pytest) with mocked dependencies and full type-hint coverage.

Key Technologies: Python, Flask, REST APIs, SQLite, NLP, Pytest

Voice-Driven Conversational AI Pipeline

Applied AI Project | VU Amsterdam | Jan 2026 | Grade: 9.5/10

- Built an end-to-end voice-interactive recipe recommendation system, fine-tuning BERT for intent classification and slot filling.
- Integrated the classifier with a Prolog knowledge base and OpenAI Whisper for speech recognition and synthesis.

Key Technologies: NLP, BERT, PyTorch, Prolog, OpenAI Whisper

Deep Learning Architecture

Machine Learning Project | VU Amsterdam | Feb-Mar 2025 | Grade: 8.5/10

- Built LeNet-5 from scratch in pure NumPy (12x speedup via Numba JIT); implemented ResNet-18 in PyTorch with custom BatchNorm and Adam optimizer.
- Benchmarked LeNet-5, ResNet-18, and ConvNeXt-tiny on MNIST using bootstrap resampling for 95% confidence intervals.

Key Technologies: PyTorch, NumPy, Numba JIT, Custom Backpropagation, Model Benchmarking

EDUCATION

BSc Artificial Intelligence, Track: Intelligent Systems

Vrije Universiteit Amsterdam | Sep 2023 - Jul 2026 | GPA: 7.8/10

Selected coursework: Multi-Agent Systems (9.5), Computational Thinking (9.5), Data Wrangling (9.0).

Minor in Electronics for Robotics

TU Delft, Faculty of Electrical Engineering | Sep 2025 - Jan 2026

Circuit Analysis (9.0), Mars Rover Project (8.5), Digital Systems (8.0), Power Electronics for Robotics (8.0).

Erasmus Exchange Semester

Universitat Politecnica de Valencia | Jan-Jun 2023

Propedeuse, Business & Event Management

Breda University of Applied Sciences | Sep 2021 - Jun 2023

WORK EXPERIENCE

Delivery Van Driver (Bezorger) - Jumbo Supermarkten B.V.

Amsterdam, Netherlands | Nov 2024 - Ongoing | Part-time

Carrying out home delivery routes across Amsterdam alongside my studies, handling scheduling, vehicle checks, and customer handoffs reliably under time pressure.

Project Manager Intern - PROSKE GmbH

Munich, Germany | Sep 2022 - Feb 2023

Coordinated pre-event planning and on-site execution for an international sales conference; managed external suppliers, budgets, and cross-functional teams to deliver against client needs.

F&B Specialist - Hotel Jakarta Amsterdam

Amsterdam, Netherlands | Nov 2023 - Aug 2024 | Part-time

Supported daily bar operations, inventory forecasting, and process improvements to increase service speed and consistency.

LANGUAGES

Polish (native) | English (C2) | Spanish (B1) | French (B1)