

Dmytro Humeniuk

AI Developer | Robotics & Machine Learning

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Summary

AI developer and PhD graduate in Computer Engineering specializing in autonomous robotic systems, simulation-based testing, and machine learning. Experienced in robotics simulation, reinforcement learning, computer vision, and software engineering for autonomous systems. Skilled in developing and testing robotic platforms using NVIDIA Isaac Sim and ROS 2, with experience deploying machine learning models on edge and cloud platforms. Research contributions include reinforcement learning, simulation-based validation, and sim2real testing of robotic perception systems.

Skills

Programming: Python, C/C++, SQL, Shell, MATLAB
Machine Learning & AI: PyTorch, TensorFlow, Scikit-Learn, Gymnasium, OpenCV
Robotics & Simulation: ROS 2, NVIDIA Isaac Sim, Gazebo
Cloud & DevOps: Docker, Kubernetes, AWS, Azure, Google Cloud
Software Tools: Git, Flask, Django, Linux
Languages: English (fluent), French (fluent), Ukrainian (native), Russian (native)

Education

PhD in Computer Engineering, with distinction, Polytechnique Montréal *Sep 2021 – Dec 2025*
Thesis: *Operational Knowledge Distillation for Efficient Testing and Enhancement of Autonomous Robotic Systems*, Supervisor: [Prof. Foutse Khomh](#)

Master of Applied Science in Computer Engineering, Polytechnique Montréal *Sep 2019 – Aug 2021*
Thesis: *A Search-Based Framework for Automatic Generation of Testing Environments for Cyber-Physical Systems*, Supervisor: [Prof. Foutse Khomh](#)

Bachelor Degree in Computer Engineering, Kyiv Polytechnic Institute *Sep 2015 – Jun 2019*
Final Project: *Automated System for Determining Solar Cell Model Parameters*

Experience

Artificial Intelligence Developer, Thales Digital Solutions, Montréal *Sept 2025 – May 2026*

- Developed software components for collaborative autonomy and robotic systems simulation.
- Contributed to AI-driven robotics projects in collaboration with multidisciplinary engineering and research teams.

Research Intern, Sycodal, Montréal *May 2023 – Sept 2025*

- Developed a search-based testing framework for robotic manipulators in NVIDIA Isaac Sim, enabling automated generation of safety-critical test scenarios.
- Designed synthetic data generation pipelines using Isaac Sim for robotic perception and manipulation tasks.
- Developed control and computer vision algorithms for pick-and-place tasks with Kinova Link 6 and Flexiv Rizon 4s robotic manipulators.
- Authored a paper published at the [IEEE/ACM International Conference on Automated Software Engineering](#).

Teaching Assistant – Advanced Software Testing, Polytechnique Montréal *Jan 2024 – May 2024*

- Designed and implemented five assignments covering fuzzing, search-based software testing, and large language model-based test generation.
- Presented lab sessions and graded assignments for a group of 12 students.

Machine Learning Software Developer Intern, Ericsson, Montréal *Jan 2023 – Jun 2023*

- Implemented decentralized gradient descent algorithms using PyTorch and BlueFog.
- Evaluated communication-computation trade-offs of distributed gradient descent algorithms in a real-world 10-node network setup.

- Teaching Assistant – Software Testing**, Polytechnique Montréal *Sep 2022 – Dec 2022*
 - Updated assignment templates to cover Pytest, fuzzing, mutation testing, load testing, and GitHub Actions pipelines.
 - Presented lab sessions and graded assignments for a class of 40 students.
- Research Intern**, COGECO, Montréal *Feb 2021 – Jun 2021*
 - Collected, analyzed, and visualized preventive-maintenance data from cable modem networks.
 - Proposed a feature-based predictive maintenance algorithm for forecasting equipment failures up to seven days in advance.
- Teaching Assistant – Software Testing**, Polytechnique Montréal *Sep 2020 – Dec 2020*
 - Developed a Naïve Bayes anti-spam system for educational exercises on software testing of machine learning systems.
 - Authored five assignments and graded submissions for a class of 45 students.
- Research Assistant**, Institute of Physics and Technology, Kyiv *Mar 2018 – Aug 2019*
 - Developed an automated semiconductor diode measurement system.
 - Co-authored an [IEEE publication](#) on thermal regime estimation of power LEDs.
- Mitacs Globalink Intern**, Laval University, Quebec *Jun 2018 – Aug 2019*
 - Designed and manufactured an energy harvesting system based on microbial fuel cells, including a MATLAB user interface.
 - Co-authored a [publication](#) on bacterial energy recovery systems.

Selected Projects

- **Dynasto** – Open-source Python tool for automated generation of adversarial driving behaviors using a combination of search and reinforcement learning. Code: [Dynasto](#). Paper: [Dynasto](#).
- **AmbieGen** – Open-source Python framework for optimization-based testing of autonomous systems, enabling configurable intelligent test generation. Code: [AmbieGen](#). Paper: [AmbieGen](#).
- **RILaST** – Open-source tool for improving search representations by mapping test inputs into the latent space of a variational autoencoder for testing autonomous vehicles and drones. Code: [RILaST](#). Paper: [RILaST](#).
- **RIGAA** – Open-source tool that uses reinforcement learning to improve initial population generation for search-based testing algorithms. Code: [RIGAA](#). Paper: [RIGAA](#).

Scholarships and Awards

- Merit Scholarship for Foreign Students, PBEEE, 50,000 CAD *May 2024*
- FRQNT Doctoral Training Scholarship *May 2024*
- CodeML Hackathon – 2nd place, CNN-based model for plant disease prediction *Oct 2023*
- CodeML Hackathon – 1st place, NLP model for language classification *Oct 2022*
- Finalist, [Human Competitive Awards](#), GECCO Conference *July 2022*
- Winner, [SBST CPS Testing Competition](#), AmbieGen tool *June 2022*

Other Activities

- Member of the [organizing committee](#) of the international competition on autonomous drone testing *2024 – 2026*
- [Participant](#), Montreal Summer School in Robotics at Mila *Aug 2022*
- [Participant](#), IVADO/Mila Deep Learning School *Mar 2021*

Volunteer Activities

- Volunteer for an automated de-mining system project. Development of computer vision models for mine detection, dataset collection and processing. *Feb – Sept 2025*
- Member of the organizing committee for the [AI Helps Ukraine conference](#). *June – Dec 2022*
- Volunteer for the Ukrainian community; organized [fundraising](#) for a VAC device for a hospital in Kyiv, raising 3,000 CAD; *Feb – Dec 2022*
- Volunteer at Entraide des Familles food bank, Montreal, 60+ hours. *July 2020 – Sept 2021*