DMYTRO HUMENIUK
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PhD candidate in Computer Engineering, specializing in the simulation of AI-powered robotic systems, with graduation expected in summer 2025. Strong background in programming, numerical methods, and machine learning, including deep learning and reinforcement learning. Expertise in advanced simulation-based testing and validation of robotic systems. Experienced in developing autonomous robotic systems using NVIDIA Isaac Sim and ROS 2, including robotic manipulators with vision-based perception.

SKILLS

Languages: Python, Shell, SQL, C/C++, Matlab
Libraries/Frameworks: TensorFlow/Pytorch, TAO 5, Scikit-Learn, OpenAI Gym, Flask, ROS2, Isaac Sim
Technologies: Git, Docker, Kubernetes, AWS, Azure cloud

LANGUAGES

- English (fluent)
- French (fluent)
- Ukrainian (mother tongue)
- Russian (mother tongue)

EDUCATION

Sept 2021 – present, Montreal, Canada
PhD in Computer Engineering
Polytechnique Montréal, GPA: 3.79/4
Research Direction*:* AI Techniques for Simulation-based Test Generation for Autonomous Robotic Systems

Sept 2019 - August 2021, Montreal, Canada
Master of Applied Science (M.A.Sc.) in Computer Engineering
Polytechnique Montréal, GPA: 3.59/4
Thesis: "A Search-Based Framework for Automatic Generation of Testing Environments for Cyber-Physical Systems"

Sept 2015 - June 2019, Kyiv, Ukraine
Bachelor's degree in Computer Engineering
National Technical University of Ukraine, Kyiv Igor Sikorsky Polytechnic Institute (Kyiv, Ukraine), GPA: 91/100, Final Project Title: "Automated System for Determining Solar Cell Model Parameters"

RELEVANT EXPERIENCE

May 2023 - present, Montreal, Canada
Internship in intelligent robotics at Sycodal
Development of a configurable simulation-based test environment for vision-based autonomous manipulator robots in the Nvidia Isaac Sim simulator. Designing pipelines for collecting synthetic datasets with Isaac Replicator. Design of control and computer vision algorithms for the execution of pick and place tasks with Kinova Link 6 and Flexiv Rison4s.

Jan 2023 - June 2023, Montreal, Canada
Machine Learning Software Developer Intern at Éricsson
Implementation of distributed and decentralized gradient descent on a cluster of compute nodes using the PyTorch and BlueFog distributed frameworks. Through experiments conducted on real nodes and network latency simulations, we have demonstrated that the decentralized CENT algorithm, developed at Ericsson, is more efficient than centralized strategies.

Jan 2024 – May 2024, Montreal, Canada
Teaching assistant for the Advanced Software Testing Methods
Development of practical work for students on advanced software testing in Python, including fuzzing, research-based testing (genetic algorithms), and test generation using language models (LLMs).

Sept 2022 - Dec 2022, Montreal, Canada
Teaching assistant for the Software Testing and Validation Methods
Development of practical work for students on software testing, covering the use of Pytest, mutation testing, fuzzing, and load testing. Metamorphic testing and set up of automated test pipelines with GitHub Actions.

Feb 2021 - June 2021, Montreal, Canada
Internship with COGECO
Preventive maintenance of cable modem networks. Cleaning and preparation of real data provided by Cogeco. Proposing a model neural network built in PyTorch to predict equipment failures up to seven days in advance.

Sept 2020 - Dec 2020, Montreal, Canada
Teaching assistant for the Software Testing and Validation Methods
Preparation of five practical assignments for the course, support for students by answering their questions and evaluation of the work submitted. Development of an anti-spam filtering system based on the Naïve Bayes algorithm.

March 2018 - Aug 2019, Kyiv, Ukraine
Research Assistant at Institute of Physics and Technology

Development of an automated system for acquiring voltage-current characteristics of semiconductor devices. (Director: Professor Gennady Monastyrsky). Our work has resulted in two publications. The most recent accepted at the IEEE 2022 International Conference "Indirect Estimation of the Operating Thermal Regime of Power LEDs"

June 2018 - Aug 2019
Quebec, Canada

Mitacs Globalink Research Internship
Design and manufacture of the energy harvesting system based on microbial fuel cells, system interface design with Matlab. Laval University, Department of Electrical and Computer Engineering (Prof. Amine Miled). Our work resulted in the publication 'Bacterial energy recovery system using natural soil bacteria in microbial fuel cells'.

ACADEMIC ACTIVITIES

Sept 2024 - present

Member of the organizing committee of the international competition on autonomous drones testing
Evaluating submissions in the Kubernetes cluster of an autonomous drone equipped with PX4 obstacle avoidance and automating the process of analyzing the results

October 2022
Montreal, Canada

Hackathon CodeML
1st place for the task of classifying the language of the text (https://bit.ly/3MrhFNT)

August 2022
Montreal, Canada

Montreal Summer School in Robotics 2022
Development of an RL-based controller for a quadruped robot (https://bit.ly/3emxiJU)

March 2021 - April 2021
Montreal, Canada

6th IVADO/Mila Deep Learning School
Certificate of participation

SCHOLARSHIPS AND AWARDS

May 2025 — **Excellence Scholarship for Foreign Students - Doctorate/PhD. (PBEEE)**
Merit Scholarship for the Doctoral Research Project (funding of 50,000 CAD for 2 years)

May 2025 — **FRQSC – Doctoral Training Scholarship**
Excellence Scholarship for the Doctoral Research Project (funding of 50,000 CAD for 2 years)

June 2022 — **Finalist of the Human Competitive (Humies) 2022 competition on evolutionary computing.**
Nomination for our research-based testing tool, presented at the GECCO 2022 conference, https://www.human-competitive.org/awards

May 2022 — **Winner of the 2022 SBST Cyber-Physical Systems (CPS) Testing Competition**
Our AbmieGen tool won the competition: https://sbst22.github.io/program/

November 2020 — **Public's Favorite Award 2020 at the first edition of IVADO Digital October**

September 2019 — **Mitacs Globalink Fellowship (CA$15,000)**

March 2018 — **2018 Mitacs Globalink Research Internship Award (CA$5,000)**

September 2015 — **Scholarship of the President of Ukraine (1000 CAD)**
Obtained for first place in the National Competition of Ukraine for Engineering and Scientific Prc category "Design of Embedded Systems"

SELECTED PUBLICATIONS

1. Dmytro Humeniuk, Houssem Ben Braiek, Thomas Reid, and Foutse Khomh. "In-Simulation Testing of Deep Learning Vision Models in Autonomous Robotic Manipulators." In *Proceedings of the 39th IEEE/ACM International Conference on Automated Software Engineering*, pp. 2187-2198. 2024, https://doi.org/10.1145/3691620.3695281

2. Dmytro Humeniuk, Foutse Khomh, and Giuliano Antoniol. 2024. Reinforcement Learning Informed Evolutionary Search for Autonomous Systems Testing. ACM Trans. Softw. Eng. Methodol. Just Accepted (July 2024). https://doi.org/10.1145/3680468

3. Dmytro Humeniuk, Foutse Khomh, Giuliano Antoniol, AmbieGen: A search-based framework for autonomous systems testing, Science of Computer Programming, Volume 230, 2023, 102990, ISSN 0167-6423, https://doi.org/10.1016/j.scico.2023.102990

4. Dmytro Humeniuk, Foutse Khomh, and Giuliano Antoniol. "A search-based framework for automatic generation of testing environments for cyber–physical systems." Information and Software Technology 149 (2022), https://doi.org/10.1016/j.infsof.2022.106936.

VOLUNTEER ACTIVITIES

February 2022 – December 2022 — Volunteer for the Ukrainian community**.** Fundraising for VAC**,** Member of the organizing team of the conference "AI Helps Ukraine"

July 2020 – September 2021 — Volunteer at the ABC Centre in Montreal
Work at the food bank for the organization "Entraide des familles", 60+ hours of work (as of June 1, 2021)