Nazar Misyats

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Education

MASc. Electrical and Computer Engineering Sept 2025 –
University of British Columbia, Vancouver, Canada

BSc. & MSc. (1st year) Computer Science Aug 2022 – Aug 2025
École Normale Supérieure de Rennes, France

Undergraduate Mathematics & Physics Sept 2020 – Jun 2022
*Classes préparatoires aux Grandes Écoles MPSI – MP**, France

Experience

CERN Summer Student, *CERN* – Geneva, Switzerland Jun - Sept 2025

Acceleration of Geant4's B-field integrator and particle-matter interaction simulation on GPU.
Supervisors: Severin Diederichs, John Apostolakis
Funding: CERN

Research Intern, *National Institute of Informatics* – Tokyo, Japan Feb - Jun 2025

3D reconstruction of auroras' plasma using physically-based machine learning.
Supervisors: Satoshi Ikehata, Yoshimasa Tanaka
Funding: National Institute of Informatics

Research Student, *Norwegian University of Science and Technology* – Norway Sept - Dec 2025

Onboard implementation of a safe drone navigation algorithm using control barrier functions.
Supervisors: Konstantinos Alexis, Marvin Harms, Martin Jacquet
Funding: Erasmus scholarship

Research Student, *University of British Columbia* – Vancouver, Canada May - Aug 2024

Development of a PyTorch's library for simulating custom floating-point formats in machine learning GPU kernels.
Supervisors: Guy Lemieux, Silviu-Ioan Filip
Funding: ENS scholarship

Research Intern, *Inria/IRISA* – Rennes, France Sept 2023 – May 2024

Design space exploration of approximate hardware multipliers for deep learning for low-power systems.
Supervisors: Marcello Traiola, Silviu-Ioan Filip, Angeliki Kritikakou

Research Intern, *Inria* – Valbonne, France May – Jul 2023

Implementation of a physically-based renderer. Extension and improvement of a real-time morphing operator for SVBRDFs.
Supervisors: George Drettakis, Alban Gauthier
Funding: Inria

Publications

Embedded Safe Reactive Navigation for Multirotors Systems using Control Barrier Functions May 2025

Nazar Misyats, Marvin Harms, Morten Nissov, Martin Jacquet, Kostas Alexis

International Conference on Unmanned Aircraft Systems (ICUAS 2025)

Range Extension with Supernormals for Mixed-Precision 8-bit DNN Training May 2025

Shing Wai Pun, Bozhang Bao, Silviu-Ioan Filip, Guy Lemieux, John V. Kim, ***Nazar Misyats***, Nirvik Pande, Victor Ravain, Robert Scherrick

International Symposium on Computer Arithmetic (ARITH 2025)

Teaching

Introduction to CUDA programming, *University of British Columbia* Jun 2024

90 minutes, 6 bachelor and master students. Introducing the CUDA programming model with practical example on developping a PyTorch extension with CUDA backend.

Lecture on procedural graphics, *ENS Rennes* Apr 2023

2 hours, 15 bachelor students. Combining raymarching and physically based methods for real-time applications.

Computer science topics, *Lycée Saint Joseph*, Dijon, France 2021 – 2023

30 hours, 15 students. Introduction to computer graphics (15 hours), computer security (7 hours) and machine learning (8 hours). Wrote 11 course documents/presentations and 9 practical works.

Introduction to astronautics and orbital mechanics, *Société Astronomique de Bourgogne* Apr 2022

90 minutes. Orbital mechanics, patched conics approximation, trajectory propagation, computational methods for trajectory optimization.

Introductory lecture on neural networks, *Lycée Carnot*, Dijon, France Jun 2021

90 minutes, 46 undergraduate students. Lecture requested by a professor. Multi-layer perceptron feedforward and backpropagation.

Electronics and robotics for children, *Fablab Kelle Fabrik*, Dijon, France 2018 – 2020

30 hours total. Children learned to design and build an obstacle avoiding robot, from the electronics to the programming.

Notable projects

Optimization tool for interplanetary trajectories with multiple gravity assists Website, GitHub

A tool for automatic design of optimal trajectories with multiple gravity assists trajectories and deep space maneuvers. Now used by hundreds of players of the video game Kerbal Space Program.

Procedural shaders Shadertoy

Implementation of several rendering techniques using GLSL shaders, such as raymarching, pathtracing, and physically based rendering.

GPU-accelerated terrain generation GitHub

Implementation of a fast marching cubes algorithm for terrain generation using OpenGL compute shaders.

Robot neuroevolution GitHub

Training a neural network to drive a robot in a simulation with a genetic algorithm. The trained models were successfully tested on a real robot.

Extracurricular activities

Competitive programming 2020 – 2023

Top 10 finalist of the national coding competition *Prologin*.

Astropi project 2020

Experiment selected for the Astropi highschool competition organized by ESA. Wrote and ran a custom Python script on the International Space Station.

Skills

Programming: C/C++, Python, CUDA, GLSL, JavaScript/TypeScript, C#, HTML/CSS, OCaml, PHP, SQL

Frameworks: PyTorch, Unity, Node.js, .NET, OpenGL/WebGL, LaTeX, Arduino, Tensorflow/Keras

Languages: French (native), English (fluent), Ukrainian (basics)