Mikael Yeghiazaryan

myeghiaz@illinois.edu | LinkedIn | GitHub
Research Assistant at University of Illinois Urbana-Champaign

Education

University of Oxford — Oxford, UK
Bachelor & Master of Engineering Science — *October 2018 – June 2022*

- Graduated with a 1st Class Honours; ranked 15 out of 159
- Received the Swire Scholarship for excellent academic performance

"Quantum" Gymnasium — Yerevan, Armenia
International Baccalaureate Diploma (High School) — *September 2016 – July 2018*

- Overall IB score: 41/45

Research Projects

Safe Autonomous Unmanned Aerial System | *UIUC* — July 2024 – present

- Supervision: Dr. Naira Hovakimyan.
- Description: Our work focuses on implementing an autonomous unmanned aerial system that is capable of safe operation in scenarios where a serious system fault occurs, e.g. GPS signal is lost or an actuator is stuck. My responsibility is to develop a simulator for air taxis in cluttered urban environments using CARLA.
- Skills: Simulation (CARLA, Gazebo), ROS.

Augmenting Aerial Imagery using Vision-Language Models | *CMU* — September 2023 – present

- Supervision: Dr. Fernando De la Torre and Dr. Jessica Hodgins.
- Description: Our goal is to enhance aerial/satellite imagery employed as training data for vehicle detection. Our primary focus revolves around leveraging advanced text-to-image models, such as Stable Diffusion, to generate and augment data in a controllable manner. We are also running adversarial attacks on these generative models to assess their stability, and explain detector performance using language.
- Skills: diffusion models, generative AI, vision-language models, large language models, prompt engineering.

Practical Adversarial Attacks on Aerial Imagery | *CMU* — September 2022 – December 2023

- Supervision: Dr. Fernando De la Torre and Dr. Jessica Hodgins.
- Description: This project focused on devising practical adversarial attacks against aerial vehicle detectors.
- Skills: adversarial attacks, 3D differentiable rendering (PyTorch3D, Kaolin), synthetic data generation, Deep Neural Networks for object detection, Blender, teamwork, presentation skills.

4th year Master Thesis Project | *University of Oxford* — September 2021 – June 2022

- Title: Learning generalizable keypoints for object pose estimation.
- Supervision: Dr. Joao Henriques and Dr. Dylan Campbell (Visual Geometry Group, University of Oxford).
- Description: I worked on creating a novel approach for unseen object pose estimation using general features and low-resolution CAD models of unseen objects.
- Skills: differentiable rendering (PyTorch3D), 3D geometry, work ethics.

3rd year Group Project | *University of Oxford* — September 2020 – May 2021

- Title: Formula Student Electric Vehicle (EV) Race Car Design.
- Supervision: Dr. Dan Rogers (University of Oxford).
- Description: I worked on the design of the electronics and control systems for a Formula Student EV race car.

MIT GTL Project — June 2016 – August 2016

- Title: Movie Feedback Classification Using the Perceptron Algorithm.
- Supervision: Hayk Saribekyan (MIT student at the time of the project).
- Description: I trained a perceptron classifier which classified movie reviews (given as a raw text input) either positive or negative, and managed to achieve 96% accuracy on the test dataset.

Work Experience

Research Assistant — Urbana-Champaign, IL, USA
Advanced Controls Research Laboratory, University of Illinois Urbana-Champaign — *July 2024 – present*
- Supervised by Dr. Naira Hovakimyan.

Research Assistant — Pittsburgh, PA, USA
Robotics Institute, Carnegie Mellon University — *September 2022 – July 2024*
- Supervised by Dr. Fernando De La Torre and Dr. Jessica Hodgins.

Research Assistant — Oxford, UK
Engineering Department, University of Oxford — *November 2021 — January 2022*
- Supervised by Dr. Min Chen (University of Oxford).
- Assembled and annotated a dataset of 3D images.

Research Intern — Oxford, UK
Oxford Robotics Institute, University of Oxford — *June 2021 — August 2021*
- Supervised by Dr. Maurice Fallon (ORI).
- Integrated a 3D semantic segmentation model into a quadruped robot as a ROS (robot operating system) node.

Honours and Awards

1st Class Honours — Oxford, UK
University of Oxford — *October 2018 – June 2022*
- I achieved and graduated with 1st Class Honours (equivalent to 4.0 GPA) in all years of examinations at the University of Oxford.
- Awarded the Swire Scholarship for exceptional academic performance at my college (University College Oxford).

Honorable mention in The International Physics Olympiad — Jogjakarta, Indonesia
International Physics Olympiad, 2017 — *July 2017*

Silver medal in The International Zhautykov Olympiad (Physics) — Almaty, Kazakhstan
International Zhautykov Olympiad, 2017 — *January 2017*

Community & Leadership

Secretary and President of the Oxford University Armenian Society — Oxford, UK
Oxford University Armenian Society (OUAS) — *October 2020 – June 2022*
- I set up events for the society members.
- I engaged in the promotion of the society's events at the university level.

Lecturer of Engineering Science — Yerevan, Armenia
"Quantum" Gymnasium — *August 2019*
- I lectured engineering of electronics at my alma mater's summer camp for high school students.

President of the Experimental Physics Club — Yerevan, Armenia
"Quantum" Gymnasium — *October 2016 – March 2018*
- I founded a club for conducting experiments in physics and helped other students with their assignments.

Skills

Programming Languages: Python, C/C++, Matlab.
ML & AI: PyTorch, Natural Language Processing, Transformers, CLIP, Diffusion Models, Tensorflow, Keras, scikit-learn, Pandas.
Computer Vision & Graphics: OpenCV, Pillow (PIL), NumPy, PyTorch3D, Blender, CARLA, PyBullet, Kaolin.
Operating Systems: skillful in Linux (Ubuntu 20.04).
Other: Git, Prompt Engineering, ROS, Arduino, Raspberry Pi, Flask, AWS, Anaconda, LaTeX, Docker, PostgreSQL.
Research: critical thinking, teamwork, communication and presentation skills, work ethics, clean coding.

Miscellaneous

Languages: Armenian (native), Russian (native), Belarusian (native), English (fluent), Spanish (beginner), German (beginner), Arabic (beginner).
Music: Playing the violin since age of 6, laureate of international contests, invited performer at Vladimir Spivakov's festival at age 10.
Chess: Achieved Class A Elo ranking at age 12, now playing recreationally (Lichess ID Michael_Yeghiazaryan).