

Damien LaRocque

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Education

Master of Science - Computer Science

Cumulative GPA: 4.26/4.33

Thesis title: "Terrain Analysis using Data from Proprioceptive Sensors on Mobile Robots"

Université Laval, Quebec City, QC, Canada

2020-2024

Bachelor of Engineering - Electrical Engineering

Université de Moncton, Moncton, NB, Canada

2015-2020

Cumulative GPA: 4.22/4.30 (Recipient of the Best Academic Achievement Award in the Faculty of Engineering's Graduating Class)

Publications

JOURNAL ARTICLES

- [1] K. Nasiri, W. Guimont-Martin, **D. LaRocque**, G. Jeanson, H. Bellemare-Vallières, V. Grondin, P. Bournival, J. Lessard, G. Drolet, J.-D. Sylvain, and P. Giguère, "Using Citizen Science Data as Pre-Training for Semantic Segmentation of High-Resolution UAV Images for Natural Forests Post-Disturbance Assessment", *Forests*, vol. 16, no. 4, p. 616, Mar. 2025.
- [2] D. Baril, S.-P. Deschênes, O. Gamache, M. Vaidis, **D. LaRocque**, J. Laconte, V. Kubelka, P. Giguère, and F. Pomerleau, "Kilometer-scale autonomous navigation in subarctic forests: Challenges and lessons learned", *Field Robotics*, vol. 2, no. 1, pp. 1628–1660, Mar. 2022.

REFEREED CONFERENCE PUBLICATIONS

- [1] **D. LaRocque**, W. Guimont-Martin, D.-A. Duclos, P. Giguère, and F. Pomerleau, "Proprioception Is All You Need: Terrain Classification for Boreal Forests", in *2024 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, IEEE, Oct. 2024, pp. 11686–11693.
- [2] M. Vaidis, W. Dubois, E. Daum, **D. LaRocque**, and F. Pomerleau, "Uncertainty Analysis for Accurate Ground Truth Trajectories with Robotic Total Stations", in *2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, IEEE, Oct. 2023, pp. 5312–5319.

Work Experience

Robotics Engineer

2025-

Sereact GmbH, Stuttgart, Germany

Research Assistant in Field Robotics

2020-2024

Northern Robotics Laboratory (Norlab), Université Laval, Quebec City, QC, Canada

- Conducted research on terrain characterization and power consumption of rovers in winter conditions using deep learning models, such as convolutional neural networks (CNNs) and Mamba.
- Executed field deployments with rovers in boreal forests under adversarial winter conditions.
- Integrated Robot Operating System (ROS) and ROS 2, configured and troubleshoot DDS, and tested Zenoh on mobile robots.
- Authored and presented a peer-reviewed paper at IROS 2024, one of the top conferences in robotics and AI.
- Co-authored 3 papers, contributing to experiments and scientific writing.

Research Assistant in Robotics

Summer 2019

Université Laval, Quebec City, QC, Canada

Developed a MATLAB interface for simulating serial robotic arms in inverse kinematics problems. This interface is used to teach inverse kinematics algorithms to mechanical engineering students at Université Laval.

- Implemented with object-oriented programming (OOP) in MATLAB
- Prototype in JavaScript

Research Assistant in Deep Learning and Artificial Intelligence (AI)

2017-2018

Université de Moncton, Moncton, NB, Canada

Developed object detection solutions with deep learning methods (Detectron, R-CNN) to identify objects on a conveyor and send the detections to a KUKA industrial robotic arm. Used TensorFlow and Keras, wrote documentation.

Research Assistant in Smart Grid Technologies

Summer 2017

University of New Brunswick, Fredericton, NB, Canada

Powerflow analysis & modelling using CYME. Learned C++, Java, and Python during the summer. Recipient of a NSERC Undergraduate Student Research Award.

Research Assistant in Home Automation (IoT)

2016-2017

Université de Moncton, Moncton, NB, Canada

- Developed a communication interface between a smart air exchanger and a database for IoT applications.
- Measured the signal emitted by an ESP8266 WiFi microcontroller.

Projects

OPEN SOURCE PROJECTS

rosbag-tools

2023-

A ROS-agnostic toolbox for common rosbag operations,

Developer and maintainer of a Python package to rapidly process *ROSBag* datasets. *ROSBag* is the standard format to record robot data in ROS.

tcr-roboclaw

2022-

An easy to install version of Basicmicro's RoboClaw Python library,

Developer and maintainer of [tcr-roboclaw](#), a Python package to control BasicMicro's *RoboClaw* motor drivers.

STUDENT CLUBS

Team Chat Robotique

2021-

Team participating in the French Robotics Cup, Le Creusot, France

Team Chat Robotique is a team participating in the [French Robotics Cup](#), the largest student robotics competition in Europe. The team's robots autonomously perform agility tasks in a given time. They are designed remotely, since all the members are spread across France and the world.

- **Electronic lead:** Robot electrical architecture design, PCB design with KiCad, Soldering
- **Programming:** Robot interfacing and drivers, Computer Vision: Pose estimation with ArUco markers, Website maintenance

CubeSat NB

2018-2019

Team of the Canadian CubeSat Project, Moncton, NB, Canada

- Participated in the kickoff meeting of the CubeSat NB project and early planning discussions. ([Press Release](#))
- Conducted in-depth research on CubeSat components and their standards, including the PC/104 standard.
- Explored the use of KubOS for programming the On Board Computer (OBC) and developed proofs of concept to determine its viability.
- Compiled and contributed to a comprehensive report detailing key technical and regulatory aspects of CubeSat development.

Groupe de Robotique de l'Université de Moncton (GRUM)

2017-2020

Team participating in the Eurobot robotics competition, Moncton, NB, Canada

GRUM is a team participating in the [Eurobot](#) competition, the European final of the [French Robotics Cup](#), with up to 300 participating teams coming from up to 40 countries around the world. The team's robots are autonomous and are designed to perform agility tasks in a given time.

- **Computer Vision:** Image processing to detect objects in images acquired by our robots, Hockey puck detection using image processing, Color sequence identification
- **Project management:** Organization of meetings and programming classes for the members of the club, Search for sponsors
- **Awards:** *Eurobot* 2019 Team Spirit Award, 2019 Student Delegation of the Year Award of Université de Moncton.

Skills

PROGRAMMING

Programming Languages Python (Expert), C++, \LaTeX , JavaScript (Bases), Rust (Bases)

Libraries/Frameworks ROS, ROS 2, OpenCV, Flask, Python scientific programming, Python packaging

Machine Learning Numpy, Pandas, Scikit-Learn, PyTorch

DevOps Git (Advanced), Docker, Podman, GitLab CI, pyenv, tmux, vcstool, Linux (Ubuntu, Debian)

Editors (neo)vim, VSCode, Experienced with JetBrains IDEs

Embedded Programming Raspberry Pi, PlatformIO, ESP32, ESP8266, Arduino, Jetson

ENGINEERING & DESIGN

Engineering KiCad, LTSpice, NI Multisim, FreeCAD, Ondsel ES, PCB design, 3D printing

Vector graphics Inkscape, \LaTeX with TikZ

LANGUAGES

French Mother tongue

English Bilingual (IELTS Academic 8.0)

German Conversational

Grants & Awards

GRANTS

2021-2022 **FRQNT scholarship for Francophone Canadians**, Fonds de recherche du Québec - Nature et technologies

2020-2021 **Canada Graduate Scholarship - Master**, Natural Sciences and Engineering Research Council

2017 **Undergraduate Student Research Award**, Natural Sciences and Engineering Research Council

2015 **21,000 \$ of scholarships**, Université de Moncton

ACADEMIC AWARDS

2020 **Best academic achievement of the graduating class**, Faculty of Engineering, Université de Moncton

2018 **Duc T. Phi Award for academic excellence in Electrical Engineering degree courses**, Faculty of Engineering, Université de Moncton

2016 **APEGNB Award for best academic standing in a first-year engineering program**, Association of Professional Engineers and Geoscientists NB

2015-2020 **Dean's List**, Faculty of Engineering, Université de Moncton

2015-2020 **Méritas Awards of the best academic performance in Electrical Engineering**, Faculty of Engineering, Université de Moncton

EXTRACURRICULAR AWARDS

2019 **Team Spirit Award - GRUM**, *Eurobot 2019*

2019 **Student Delegation of the Year Award - GRUM**, Gala Bleu et Or - Université de Moncton

2018 **Second place of Université de Moncton**, *IEEEExtreme* competitive programming challenge

2017 **First place of Université de Moncton**, *IEEEExtreme* competitive programming challenge

2015 **Third place**, *Poincaré* mathematics competition

2015 **Top 5 %**, *Sir Isaac Newton* Canada-Wide Physics competition

2015 **Eighth place**, *Opti-Math* Canada-Wide Mathematics competition

Certifications

Jan 2020 **IELTS Academic 8.0**, IELTS

Jun 2019 **WHMIS 2015**, Université Laval