

# Damien LaRocque

Stuttgart, Germany

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## Education

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### Master of Science - Computer Science

Université Laval, Quebec City, QC, Canada

2020-2024

Cumulative GPA: 4.26/4.33

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

### 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

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### 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.

## Grants & Awards

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### 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 - Groupe de Robotique de l'Université de Moncton (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**, IEEEXtreme competitive programming challenge
- 2017 **First place of Université de Moncton**, IEEEXtreme 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

# Research Experience

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## Robotics Engineer

2025-

Sereact GmbH, Stuttgart, Germany

### • Robot Learning Research Engineer:

- Fine-tuned and evaluated state-of-the-art policies (ACT,  $\pi_{0.5}$ ) for manipulation and mobile manipulation tasks on [ALOHA](#) setups.
- Contributed to [LeRobot](#), and [its integration](#) with Trossen arms.

### • Core Robotics Engineer:

- Developed and maintained a C++ codebase running one of Sereact's core robotics products.
- Led software engineering efforts on the project; reviewed and integrated contributions from other engineers.
- Improved system reliability, enabling continuous operation for months without failures.

## Research Assistant in Field Robotics

2020-2024

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

- Developed deep learning models, such as convolutional neural networks (CNNs) and Mamba, for terrain characterization and power consumption prediction of rovers in winter conditions.
- Executed field deployments with rovers in boreal forests under harsh winter conditions.
- Integrated and deployed robots using Robot Operating System (ROS)/ROS 2; configured DDS and 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; contributed to experiments, analysis, and scientific writing.

## Research Assistant in Robotics

Summer 2019

Université Laval, Quebec City, QC, Canada

Developed a MATLAB-based simulation tool for inverse kinematics of robotic manipulators. This tool is used in robotics courses at Université Laval. Prototyped using JavaScript.

## Research Assistant in Deep Learning and Artificial Intelligence (AI)

2017-2018

Université de Moncton, Moncton, NB, Canada

- Developed deep learning-based object detection pipelines (Detectron, R-CNN) for industrial applications.
- Integrated the outputs of the deep learning models to control a KUKA industrial robotic arm.
- Developed and implemented models using TensorFlow and Keras.

## 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

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## OPEN SOURCE PROJECTS

### rosvbag-tools

2023-

#### A ROS-agnostic toolbox for common rosvbag operations,

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

### tcv-roboclaw

2022-

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

Developer and maintainer of [tcv-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

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## PROGRAMMING

<b>Programming Languages</b>	Python (Expert), C++, $\LaTeX$ , Rust, JavaScript (Bases)
<b>Libraries/Frameworks</b>	ROS, ROS 2, OpenCV, Flask, Python scientific programming, Python packaging
<b>Machine Learning</b>	Numpy, Pandas, Scikit-Learn, PyTorch, Lightning, Transformers, LeRobot
<b>DevOps</b>	Git (Advanced), Docker, Podman, GitLab CI, uv, tmux, Pixi, Linux (Ubuntu, Debian)
<b>Editors</b>	(neo)vim, VSCode, Experienced with JetBrains IDEs
<b>Embedded Programming</b>	Raspberry Pi, PlatformIO, ESP32, ESP8266, Arduino, Jetson

## ENGINEERING & DESIGN

<b>Engineering</b>	KiCad, LTSpice, NI Multisim, FreeCAD, Onsel ES, PCB design, 3D printing
<b>Vector graphics</b>	Inkscape, $\LaTeX$ with TikZ

## LANGUAGES

<b>French</b>	Mother tongue
<b>English</b>	Bilingual (IELTS Academic 8.0)
<b>German</b>	Conversational

# Certifications

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- Mar 2025 **TOEFL IBT 107**, TOEFL
- Jan 2020 **IELTS Academic 8.0**, IELTS
- Jun 2019 **WHMIS 2015**, Université Laval