# Antoine Dangeard

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## Education

**McGill University — B.Eng Software Engineering, Minor in Applied A.I.** Montreal, Canada
*CGPA 3.85/4.0* *2020 - 2025*

## Professional Experience

**Research Assistant** Aug. 2024 - Present
*McGill N.L.P. Lab* *Montreal, Canada*
- Working directly with Ines Arous, Ph.D, under Prof. Jackie Cheung, on the continuation of the TaxoComplete paper.
- Optimized taxonomy prediction function to run about 20x faster.
- Responsible for analysis of related works to find potential improvements and/or other research directions.
- Work ongoing.

**H.i.L. Software Engineer Intern** May - Aug. 2024
*Torc Robotics* *Montreal, Canada*
- Researched, designed and implemented data injection infrastructure for HiL (Hardware-in-the-loop) test benches. Design supported manual and automatic (CI/CD) testing of ROS components with MCAPs.
- Created ROS2 MCAP replay and recording tool from scratch in C++ with Python bindings. Enabled developers to replay and record any ROS2 messages without requiring prior knowledge of custom ROS message types.
- Simplified testing procedure from requiring custom builds and 15-20 commands to a single distributable environment and under 5 commands.

**Software Engineer Intern in Robot Team** May - Aug. 2023
*Vention* *Montreal, Canada*
- Optimized joint speed limiting during Cartesian linear movements of 6-D.O.F. robotic arms, resulting in increased maximum speed of linear movements and improved U.X.
- Improved U.I. to view and modify end-of-arm tool offsets and view live status of hardware, implemented self-collision checking for end-of-arm tools.

## Robotics

**Project Manager and Software Lead** Jan. 2024 - Present
*McGill Humanoid Project* *Montreal, Canada*
- Founded undergraduate design team focused on building and controlling a humanoid robot
- Led 10 engineers, successfully raising over $10,000 in value in under 4 months.
- Single-handedly created software architecture, R.L. and R.O.S. simulations (MuJoCo/Unity), R.L. training framework and model-predictive controllers from scratch.

**Research Volunteer** May 2024 - Present
*Neuro AI* *Montreal, Canada*
- *Aug. 2024-Present*: Research project targeting the NeurIPS conference. Implemented baseline RL algorithms in custom environment, optimized simulation for faster training times, and technical writing for paper.
- *May 2024-Sep. 2024*: Provided guidance and technical advice for an undergraduate research project. Regularly met with the student implementing the research effort to answer questions and help with problems encountered during implementation.

**Research Volunteer** May 2023 - Present
*Prometheus Lab* *Montreal, Canada*
- *May 2024-Present*: Proposed and implemented independent research project on domain knowledge-based pre-training for reinforcement learning control policies.
- *Sep.-Dec. 2023*: Re-designed and implemented server infrastructure for multi-agent inter-robot communication and control. Reduced number of lines of code in the server from over 5000 to less than 300 whilst preserving functionality and improving maintainability and compatibility with robot hardware.
- *May-Sep. 2023*: Technical lead for multi-agent robotic delivery project. Obtained $7500 TechAccel Summer Stipend from McGill Engine and implemented control, mapping, and planning ROS packages for vehicle from scratch.

**McGill Robotics AUV Software** Sep. 2022 - August 2024
*Software Team Lead* *May 2023 - August 2024*
- Created tutorials, onboarding plan, and thorough documentation for new members; more than doubling retention rate from previous years.
- Implemented mandatory code reviews, issue tracking, scheduled documentation upkeep, and automatic integration testing pipelines, successfully preventing any major code breakages throughout the year.
- Build new simulation from scratch with improved performance, more Q.o.L. features, and better sim-to-real than previous framework.
- Assisted members with state estimation, pose control, computer vision, and simulation.

*Software Team Member* *Sep. 2022 - May 2023*
- Built object detection, mapping, and autonomous planner from scratch, enabling the team to reach semi-finals for the first time since 2020.

## Skills

**Languages**: Fluent in English and French
**Programming**: Python, Javascript, C++, Bash, C, Java, C#
**Frameworks**: ROS (1 & 2), Pandas/NumPy, CUDA, PyTorch/TensorFlow/Keras, Unix, WebSocket/TCP/HTTP/UDP, Node.js, React.js
**Developer Tools**: Colab/Jupyter, Docker, Git, GitHub/GitLab, AWS

## Awards

**Tomlinson Engagement Award for Mentoring in MECH 360 (Principles of Manufacturing)** December 2023
**2nd place at McGill A.I. Hackathon** September 2023
**1st place at McGill RoboHacks** March 2023
**Top 5 of 115 at McHacks** January 2023
**Top 10 at McGill Data Challenge** January 2023
**Grade A in McGill A.I. Society M.L. Boot-Camp** September - December 2021