Antoine Dangeard

McGill University
Faculty of Engineering
845 Sherbrooke St W
Montreal, Quebec H3A 0G4

antoine.dangeard@mail.mcgill.ca
antoinedang.github.io
GitHub: antoinedang
+1 (514) 690-1526

Education

McGill University — Montreal, CA
B.Eng. in Software Engineering, GPA 3.85/4.0 — *Expected, May 2025*

- Participated in 2.5 years of undergraduate research under the guidance of Prof. Joseph Vybihal, Prof. Jackie Cheung, and Prof. Isabeau Premont-Shwartz.
- Capstone project: Development of a Humanoid Robot with Dynamic Motion Planning

Lycée International Georges Duby — Aix-en-Provence, FR
Scientific Baccalaureate with IB Option, 16/20 — *June 2020*

- Concentration in Computer Science

Research Experience

McGill N.L.P. Lab — Montreal, CA
Advisors: Prof. Jackie Cheung, Ines Arous, Ph.D

- *May 2024 - Present*: Working directly with Ines Arous on the continuation of the TaxoComplete (Self-Supervised Taxonomy Completion) paper. Optimized taxonomy prediction function from 45 minute runtime down to 2 minutes. Responsible for analysis of related works to find potential improvements and/or other research directions.

Prometheus Lab — Montreal, CA
Advisor: Joseph Vybihal

- *January 2024 - Present*: Led humanoid robot research project in lab. Implemented ROS infrastructure and simulation environments, trained deep learning policy for locomotion, implemented analytical control policy using inverse dynamics, and explored research directions using the humanoid as a platform for research.
- *May 2024 - Present*: Formulated independent research project on domain knowledge-based pre-training for reinforcement learning control policies. After reviewing prior work, I proposed the project to Prof. Vybihal and implemented the algorithm. Work is ongoing.
- *September - December 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 1000+ to less than 300 whilst preserving functionality and improving maintainability and compatibility with robot hardware.
- *May - September 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.

Research Interest

My research interests broadly encompass:

- Motion planning for under-actuated robots in uncertain environments.
- Computer vision for state estimation and scene understanding in autonomous agents.

- Multi-robot coordination.

Overall, I enjoy exploring analytical or machine learning techniques to solve complex problems in robotics.

Awards

Tomlinson Engagement Award for Mentoring for my role as a mentor in MECH 360 (Principles of Manufacturing)

TechAccel Summer Undergraduate Stipend Award ($7500) for my leadership in a multi-agent robotic delivery system developed in Summer 2023. The award was granted to our project for its technological innovation and strong business case.

Advising Experience

Prometheus Lab – Multi-Agent Server *December 2023 - Present*

- Serving as advisor for all students with questions or concerns with the multi-agent server for inter-robot communication. Regularly met with students to explain the architecture of the system, help with debugging, etc.

Prometheus Lab – Humanoid *May 2024 - August 2024*

- Overseeing an undergraduate student for the implementation of SLAM on the humanoid robot. Helping student understand theoretical concepts, and validating and integrating work into the humanoid software and hardware.

Neuro AI – Testbench for Animal Cognition *May 2024 - August 2024*

- Provided guidance and technical advice for an undergraduate research project; the development of an enhanced version of the previous AnimalAI Environment. Regularly met with the student implementing the research effort to answer questions and help with problems encountered during implementation.

MECH 360 – 3D Printing *September 2023 - December 2023*

- Assisted students with the printing and viability assessment of part designs for a course assignment. Provided through the EUS Cube 3D printing service.

Industry Experience

H.i.L. Software Engineer Intern Montreal, CA
Torc Robotics *May 2024 - August 2024*

- 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 ROS2 builds and about 15-20 commands to a single docker container and under 5 commands.

Robotics Intern Montreal, CA
Vention *May 2024 - August 2024*

- Optimized joint speed limiting method for Cartesian linear movements of 6-D.O.F. robotic arms, resulting in increased maximum speed of linear movements and improved U.X. Decreased cycle time for pick-and-place tasks by 10-30%.
- Added CAD U.I. to view and modify end-of-arm tool offsets and implemented self-collision checking for end-of-arm tools.
- Built connection status detection and corresponding UI for UR arms.

Publications

[NAME TBD] TaxoComplete Follow-up Study Ongoing

Skills

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

References

Professor Joseph Vybihal
School of Computer Science
McGill University
joseph.vybihal@mcgill.ca
-

Professor Jackie Cheung
School of Computer Science
McGill University
jackie.cheung@mcgill.ca
+1 (514) 398-5491

Professor Isabeau Premont-Shwartz
School of Computer Science
McGill University
isabeau.premont-schwarz@mcgill.ca
-