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

NLP Research Assistant **Aug. 2024 - May 2025**
McGill N.L.P. Lab (at MILA) *Montreal, Canada*

- Working directly with Ines Arous, Ph.D, under Prof. Jackie Cheung, on the continuation of the TaxoComplete paper. TaxoComplete is a machine learning approach to the taxonomy completion problem, in which new concepts need to be inserted into a tree where higher-level nodes represent broader categories.
- Improved accuracy of method by nearly 50% through modification of data labelling when fine-tuning pre-trained DistillBert LLM.
- Tooling included huggingface, sentence-transformers library, and distributed training on SLURM GPU cluster.
- Currently preparing for journal submission to ACM.

H.i.L. Software Engineer Intern **May - Aug. 2024**
Torc Robotics *Montreal, Canada*

- Implemented data injection for HiL (Hardware-in-the-loop) test benches, enabling manual and CI/CD testing of ROS components.
- Created ROS2 MCAP replay and recording tool from scratch in C++ with Python bindings. Allows for replay and recording of messages without requiring prior knowledge of custom message types through only a single distributable environment and under 5 setup 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. Decreased cycle time for pick-and-place tasks by up to 20%.
- Improved U.I. to view and modify end effector offsets and view live status of hardware, and added self-collision checking for end effector.

Extra-Curricular

Project Manager and Software Lead **Sep. 2024 - May 2025**
McGill Humanoid Project *Montreal, Canada*

- Founded design team of 6 focused on building a humanoid robot, successfully raising over $10,000 in value in under 4 months.
- Single-handedly created reinforcement learning pipeline, simulations in MuJoCo and Unity, model-predictive control infrastructure, and software architectural design from scratch using Python, C++, PyTorch and Jax.

Research Volunteer **Aug. 2024-Jan. 2025**
Neuro AI *Montreal, Canada*

- Research project accepted to NeurIPS conference, proposing baseline environment to evaluate the ability of RL algorithms to learn animal locomotion and navigation skills.
- Implemented reinforcement learning training pipeline for training baseline algorithms in PyTorch; final pipeline was able to support 6 different algorithms and HER.

Research Volunteer **May 2023 - May 2025**
Prometheus Lab *Montreal, Canada*

- *May 2024-Jan. 2025*: Proposed and implemented independent research project on domain knowledge-based pre-training for reinforcement learning control policies using PyTorch. Method allowed for incorporation of high-level rules defined by humans into policy before training.
- *Sep.-Dec. 2023*: Re-designed and implemented server infrastructure for multi-agent inter-robot communication and control between heterogeneous robots. Reduced lines of code from over 5000 to less than 300 whilst improving functionality and maintainability.
- *May-Sep. 2023*: Technical lead for multi-agent robotic delivery project, in which hetergeneous robots had to autonomously map and navigate an unknown environment. Obtained $7500 TechAccel Summer Stipend from McGill Engine and implemented control, mapping, and planning ROS packages from scratch.

McGill Robotics AUV Software **Sep. 2022 - August 2024**
Software Team Lead *May 2023 - August 2024*

- Led members in effort to build state estimation, pose control, computer vision, and simulation software. Involved concepts like EKFs, PID controls for quaternions, CNNs for discrete 3D scene reconstruction, OpenCV for image processing, etc.
- Built new simulation from scratch in Unity with improved performance, more Q.o.L. features, and better sim-to-real.
- 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.

Software Team Member *Sep. 2022 - May 2023*

- Reached semi-finals for the first time since 2020 with all-new software stack.
- Built object detection, mapping, and autonomous planner from scratch using YOLO, a custom 2D-to-3D scene reconstruction module, and recursive state machines.

Skills

Languages: American English (Native Speaker), French (Native Speaker)
Programming: Python, C++, Bash, Javascript, C, Java, C#
Frameworks: ROS 1/2, Pandas/NumPy, CUDA/Jax, PyTorch/TensorFlow/Keras/huggingface/transformers, Unix, Node/React
Developer Tools: Colab/Jupyter, Docker, Git, GitHub/GitLab, AWS, Jenkins, Slurm, Unity, MuJoCo, Gazebo

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