# Andrew Stirling

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## Education

**M.Sc (Thesis), Mechanical Engineering** Sept. 2024 – May 2026
***McGill University*** *Montréal, CAN*

- *GPA*: 4.0/4.0.
- *Thesis*: Ultra-wideband sensing for robotic navigation in GPS-denied environments.
- *Honors & Awards*: Ian McLachlin Prize for Entrepreneurship in Engineering, McGill Engineering Undergraduate Student Master's Award

**B.Eng, Mechanical Engineering (Minor Computer Science)** Sept. 2019 – May 2024
***McGill University*** *Montréal, CAN*

- *GPA*: 3.78/4.0.
- *Honors & Awards*: Engine Design Prize, Antje Graupe Pryor Award, RISE Globalink Award, Dean's Honour List, Alexander Rutherford Scholarship.
- *Extracurriculars*: McGill Men's Volleyball Team, McGill Robotics Club, McGill Tutor, and Teaching Assistant.

## Experience

**M.Sc. Thesis Candidate** Sept. 2024 – Present
***DECAR Group, Supervised by Prof. James R. Forbes*** *Montréal, CAN*

- Developed a novel variational inference framework for robotic state-estimation handling non-line-of-sight (NLOS) and multipath effects common in ultra-wideband (UWB) and other ranging sensors.
- Deployed a continuous-time, tightly-coupled UWB-vision-inertial SLAM pipeline for applications to UAVs.

**Co-Founder** Sept. 2023 – Aug. 2024
***OPSIS*** *Montréal, CAN*

- Capstone design project turned startup accepted into McGill Engine's TechAccel incubator program.
- Developed and applied a novel Kalman filtering algorithm for occlusion robust surgical tool localization in neuro-navigated surgeries.
- Assisted in the mechanical design of a multi-camera fixture for attachement to surgical lamps.

**Robotics Research Intern** Jun. 2023 – Aug. 2023
***University of Applied Sciences & Technology*** *Berlin, GER*

- Conducted extensive testing of diverse quadruped control strategies utilizing MuJoCo and validated outcomes through physical testing on the Unitree Go1 Robot, utilizing a ROS2 (Robot Operating System) package tailored for low-level control.
- Assisted in the development and successful implementation of an Iterative Learning Controller (ILC), capable of tracking commanded velocities within 5 % relative error.
- Co-authored paper detailing control framework accepted and presented at the European Control Conference (ECC).

**Mechanical Engineering Intern** May 2021 – Sep. 2021
***Bauer Hockey*** *Montréal, CAN*

- Enhanced the custom stick traceability database for professional players, helping keep track of valuable equipment and retain top-level talent for Bauer.
- Performed and automated data analysis on millions of lines of Bauer production data using PowerBI and MATLAB to receive real-time updates on KPIs, quality control trends and other relevant information.
- Communicated on an English and French basis within team meetings.

## Publications

[1] Manuel Weiss, Andrew Stirling, et al. "Achieving Velocity Tracking Despite Model Uncertainty for a Quadruped Robot with a PD-ILC Controller". In: *2024 European Control Conference (ECC)*. June 2024, pp. 134–140. DOI: 10.23919/ECC64448.2024.10590932.

## Skills

**Programming**: Python, C/C$^{++}$, Java, MATLAB, OCAML, VBA, LaTeX, MIPS Assembly.

**Software**: Gazebo, MuJoCo, Git, SolidWorks, ABAQUS, MasterCAM, Excel, MS PowerBI, CURA.
**Operating Systems**: Linux, Windows, ROS 1/2
**Languages**: **English** (Fluent), **French** (Advanced)