Jack Quirion

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Education

University of Waterloo — Waterloo, ON, CAN
Master of Mathematics in Combinatorics and Optimization — *Jan. 2026 – Present*

- Specialization: Graph theory
- Supervisor: Prof. Penny Haxell

University of Ottawa — Ottawa, ON, CAN
Joint Honours Bachelor of Science in Computer Science and Mathematics (CO-OP) — *Sept. 2021 – Dec. 2025*

- CGPA: 9.95/10
- *The Directed Oberwolfach Problem: Small Cases — A Computational Approach* (Prof. Mateja Šajna)
- *Connected Dominating Sets in Triangulations* (Prof. Vida Dujmović and Prof. Pat Morin)

Research Experience

Game Theory Research Intern — May 2025 – Aug. 2025
Institute of Science and Technology Austria (ISTA) — *Klosterneuburg, Lower Austria, AUT*

- Member of the Chatterjee Group under the supervision of Dr. Krishnendu Chatterjee.
- Studying the complexity of multi-objective reachability in turn-based stochastic games.

Operations Research Intern — Jan. 2024 – May 2024
Defence Research and Development Canada — *Ottawa, ON, CAN*

- Developed a differential equations model to simulate training, mentor-mentee and attrition dynamics within fleets of the Royal Canadian Air Force (RCAF).
- Created and deployed a tool in Python based on this model for use by decision-makers in the RCAF, enabling custom scenario analysis with adjustable parameters and showcasing visualizations of key information, such as phase diagrams of personnel states through time and areas of system sustainability.

Publications

A mentored experience accumulation differential model: rapid parameter space analysis applied to Royal Canadian Air Force pilot production, absorption, and retention
Winter Simulation Conference (WSC), 2024, https://doi.org/10.1109/WSC63780.2024.10838854
With S. Okazawa, R.M. Bryce, and J.A. Henderson

Teaching

Teaching Assistant
University of Ottawa

- ITI 1120 – Introduction to Computing I (Fall 2025)
- MAT 1720 – Calcul différentiel et intégral I (Calculus 1) (Fall 2025)

Awards

- **Student Mobility Scholarship**, University of Ottawa — 2025
- **Power Corporation of Canada International Experience Scholarship**, University of Ottawa — 2025
- **Dean's Honour List**, University of Ottawa — 2021-2025
- **CO-OP Student of the Year**, University of Ottawa - Faculty of Engineering — 2024
- **CO-OP Student of the Year (Second place)**, University of Ottawa — 2024

Other Experience

Tutor Aug. 2022 – Present
Scholars Education *Ottawa, ON, CAN*

- Provided individualized tutoring in mathematics, computer science and physics to high school students, adapting lesson plans to diverse learning styles.
- Monitored student progress and collaborated with parents and staff to create strategies that improved student confidence and academic performance.

AI/ML Engineering Intern Sept. 2024 – Dec. 2024
Raven Connected Inc. *Ottawa, ON, CAN*

- Developed and implemented event detection algorithms (e.g. refueling) for use on vehicle video telematics devices.
- Built a real-time snap-to-road feature with intersection, crosswalk and speed camera detection, including data preprocessing, cloud communication with AWS and model implementation on Android device.

Data Science Intern May 2023 – Aug. 2023
Communications Research Centre Canada *Ottawa, ON, CAN*

- Designed, implemented, and trained a sophisticated Multi-Agent Reinforcement Learning (MARL) model utilizing PettingZoo and RLlib to simulate bid generation strategies in a dynamic spectrum auction environment.
- Conducted comprehensive analyses of the auction format and procedures leveraging the MARL model outputs, identifying key areas for enhancement and proposing actionable recommendations to improve auction effectiveness.

Technical Skills

Languages: Python, Java, SQL, MATLAB, Go, C++, C, LaTeX, HTML, CSS
Developer Tools: Git, GitHub, Anaconda, Jupyter, AWS, Android Studio, Linux
Libraries: pandas, NumPy, Matplotlib, RLlib, TensorFlow, PyTorch, scikit-learn, SciPy

Languages

English: Native, **French**: Fluent