

JONATHAN LAMONTAGNE-KRATZ

AI RESEARCHER & SOFTWARE ENGINEER

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EXPERIENCE

Independent RL Researcher

March 2026

MSURJ Poster Presentation

Montreal, QC

- Authored and presenting a research poster detailing the integration of MuZero advancements (EfficientZero V2, Gumbel MuZero) for stochastic multi-agent environments.
- Showcasing the architecture and empirical benchmarks of "RainbowZero," a custom superhuman agent for Settlers of Catan.

AI Researcher Intern (Hybrid)

May 2025 – August 2025

Edgenda

Montreal, QC

- Researched LLM architectures and their application in enterprise automation systems to guide product strategy.
- Developed data pipelines to process and visualize complex model performance metrics for non-technical stakeholders.
- Collaborated with cross-functional teams to integrate LLM capabilities into enterprise software solutions.

Reinforcement Learning Research Lead

January 2025 – May 2025

McGill Student AI Research Lab

Montreal, QC

- Led a research team to recreate key RL papers, including AlphaZero, MuZero, PPO, and RainbowDQN.
- Implemented Monte Carlo Tree Search (MCTS) and Deep Q-Learning from scratch, managing code reviews and system architecture.

Undergraduate Researcher

September 2024 – December 2024

McGill University (Prof. Schwarz's Lab)

Montreal, QC

- Implemented key components of the SLAM algorithm based on RatSLAM and VectorHASH for efficient mapping.
- Co-authored an article on RatSlam 2.0 (Bio-inspired SLAM).
- Developed Python simulations for cognitive mapping and performed statistical analysis to validate algorithmic convergence.

Software Team Member

August 2023 – January 2024

McGill AUV Robotics Team

Montreal, QC

- Engineered the software system for the McGill AUV, upgrading the PID system and designing joystick controls using Python and Rospy.

Team Captain & Lead Systems Engineer

Aug 2019 – May 2023

VEX Robotics Competition (ISB)

Bangkok, Thailand

- Engineered autonomous robots using C++ and custom PID control loops for precise motion profiling.
- Implemented sensor fusion algorithms combining odometry and vision sensors to automate complex field tasks.
- Led the engineering design lifecycle from CAD prototyping to physical fabrication and testing.

Research Intern

June 2026 – Present

Retail Realm

Montreal (Remote)

- Architected a Python-based telemetry tool to unify multi-line payment system logs, implementing a time-windowed correlator for accurate cross-component event mapping.
- Engineered automated data pipelines that calculate hardware clock drift, normalize log formats, and automatically mask sensitive PII/PCI data for strict security compliance.
- Prototyped LLM integrations to analyze filtered error datasets, automatically generating diagnostic summaries and actionable remediation steps for system failures.

Researcher
McGill University (Prof. Navarra's Lab)

May 2025 – Present
Montreal (Hybrid)

- Architected a Python-based Discrete Rate Simulation (DRS) engine to model complex mining operations, including dynamic mass balance, stochastic ore generation, and fleet logistics.
- Implemented complex fleet management logic based on published research, translating theoretical operating modes into programmatic, first-class simulation components to publish a journal paper.
- Engineered a "Python-first" modelling framework utilizing execution contexts for dependency tracing, abstracting complex DRS logic for accessible industrial application.

Kitchen Volunteer
The Open Door

August 2025 – May 2025
Montreal

- Assisted with food preparation, service, and organization in a fast-paced environment.
- Collaborated with staff to maintain efficient operations and support community members.

Camp Counselor
Acadecap

May 2024 – August 2024
Ottawa

- Led structured activities and supported youth learning in a collaborative setting.

Camp Coordinator
STEM Camp

May 2023 – August 2023
Ottawa

- Managed daily operations, schedules, and logistics for 50+ participants.
- Supervised staff and ensured a safe, structured, and engaging environment.

EDUCATION

McGill University
B.Sc. Honours Computer Science

August 2023 – December 2027

CGPA: 3.77 / 4.00. Coursework: Applied Machine Learning, Reinforcement Learning, Algorithms and Design, Numerical Computing, Probability & Statistics, Linear Algebra.

International School of Bangkok
IB Diploma

May 2023

Graduated with High Honours. IB Score: 42/45.

PROJECTS

Advanced RL Framework

 github.com/epicgamer17/modular-rl

March 2024 – Present

Independent Researcher

- Developing a superhuman Stochastic MuZero agent for Settlers of Catan, extending architecture to support multi-agent environments via PettingZoo.
- Engineered a modular RL library implementing SOTA algorithms: EfficientZero V2, Gumbel MuZero, and RainbowDQN.
- Integrating theoretical frameworks from Sutton’s Alberta Plan to advance long-term planning capabilities, and apply to true online stream RL.

Pantry Pilot
Full Stack Developer

Jan 2026

- Developing a cross-platform mobile application for inventory management using React Native and Expo.
- Engineered a scalable backend to handle real-time user data, recipe suggestions, and shopping lists.

Aldo AI Hackathon
Full Stack Developer

Oct 2024

- Designed a semantic search engine using vector embeddings, winning \$1500 for technical innovation.
- Optimized retrieval latency for large-scale product datasets using indexing strategies.

SKILLS & AWARDS

Technical Skills:

Python, C++, C, C#, Java, JavaScript, TypeScript, MATLAB, R, SQL, Bash, PyTorch, TensorFlow, Ray, Optuna, NumPy, Pandas, Scikit-learn, Vector Embeddings, RAG, Monte Carlo Tree Search,

Quantization (PTQ/QAT), Game Theory (Nash Eq.), Stochastic Processes, SLAM (RatSLAM, VectorHASH)

Languages: English, French

Certifications: Introduction to TensorFlow for Deep Learning (Google through Udacity, July 2022), Machine Learning with Python (Free Code Camp, May 2022), Responsive Web Design (Free Code Camp, April 2022), JavaScript (Code Academy February, 2022), Game Design certified (Global Online Academy, May 2021), First Aid Certified (August 2023)

Awards: Aldo AI Hackathon 3rd Place Winner (\$1500)