

Nate Lamarche

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EDUCATION

University of Waterloo

Sep 2025 - Apr 2030

Bachelor of Software Engineering (BSE)

Cumulative Average: **93%**

Relevant Coursework: Linear Algebra (100%), Calculus II & Multivariable Calculus, Data Abstraction & Implementation, Digital Circuits & Systems; *In progress*: Compilers, Statistics

EXPERIENCE

WAT.ai

Sep 2026 - Present

Machine Learning Researcher

Waterloo, Ontario

- Developing reinforcement learning controllers for locomotion of a tendon-driven soft quadruped robot using PyTorch
- Implementing and evaluating model-free and model-based reinforcement learning approaches for gait control
- Supporting sim-to-real deployment by integrating learned control policies with physical robot hardware

Ernst & Young (EY)

May 2026 - Aug 2026

Software Engineering Intern

Toronto, Ontario

- Developed and maintained production Java/Spring Boot services for a financial institution serving 13M+ clients
- Improved production resilience with retry logic, exception handling, and automated tests for Spring Boot services
- Built a cloud-native banking API with AWS Lambda, SQS, DynamoDB, RDS, and Node.js for 6 unique endpoints
- Implemented JWT authentication, transfer idempotency, secure file access and configured VPC networking

Uplus Education

Feb 2024 - Jun 2024

Web Developer Intern

Remote

- Implemented client-side JavaScript features for custom interactions, dynamic UI behaviour, and application logic
- Analyzed website usage data to identify patterns and drive data-informed improvements to site structure and UX

PROJECTS

RL Inverted Pendulum

Aug 2026 - Sep 2026

Python · PyTorch · Gymnasium · NumPy

- Built a sim-to-real reinforcement learning control system to balance a physical rotary inverted pendulum
- Implemented PPO from scratch in PyTorch with clipped policy updates, GAE, and entropy regularization
- Pretrained via Imitation Learning from an LQR controller, achieving 0.41° angular RMSE on local balancing trials
- Deployed the RL policy to hardware, integrating sensor-based state estimation and closed-loop motor control

Neural Chess Engine

Mar 2026 - Aug 2026

C++ · Python · PyTorch

- Built a chess engine with 7.7M+ move-generation nodes/s and an Efficiently Updatable Neural Network (NNUE)
- Designed and trained the NNUE chess evaluator in PyTorch with 45K sparse features on 50M labeled positions
- Deployed 66MB model in native C++ with no external ML runtime, matching PyTorch within 1e-6 absolute error
- Implemented incremental NNUE accumulator updates, improving neural search throughput by 24% to 761K nodes/s

Goose Trials

Dec 2025 - Jan 2026

TypeScript · React · Next.js

- Led the development of a Next.js/React web app with 7 cognitive mini-games for university students
- Reached 8,000+ games played, 1,000+ unique users and 100+ authenticated sign-ups within first 24 hours of launch

SKILLS

- **Languages:** Python, C++, C, TypeScript, JavaScript, Java, SQL
- **Frameworks & Libraries:** PyTorch, NumPy, Pandas, Matplotlib, Gymnasium, Spring Boot, React, Next.js
- **Cloud & Infra:** AWS (Lambda, SQS, API Gateway, Cognito, DynamoDB, RDS, S3, MSK), PostgreSQL, Git/GitHub
- **Technical Areas:** Machine Learning, Reinforcement Learning, Backend/API Development, Cloud Infrastructure