# Robin Leman

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## EDUCATION

**University College London**                                              September 2025 - September 2026
*MSc in Computational Statistics and Machine Learning.*                                        *London, UK*
- Anticipated Coursework: Supervised & Unsupervised Learning, Deep Learning, Reinforcement Learning, Statistical NLP

**McGill University**                                                              September 2019 - May 2022
*BSc in Physics and Computer Science. CGPA: 3.82/4.00.*                                     *Montreal, Canada*
- Led a 10-person exec team as President of GameDev McGill; organized workshops and hackathons for 150+ students.

## WORK EXPERIENCE

**Electronic Arts - Respawn Entertainment**                                     July 2023 - September 2025
*Software Engineer - C++*                                                                 *Vancouver, Canada*
- Designed and implemented a high-performance Entity-Component-System library with EnTT, improving feature scalability and runtime performance for highly parallelized, data-driven simulations.
- Implemented and optimized cross-platform networking code for real-time replication, interpolation, and prediction, reducing memory usage across all distributed clients.
- Designed a performant runtime type reflection system with entt::meta, leveraging modern C++ and meta-programming, enabling low-overhead data serialization in large-scale systems.
- Developed a specification testing framework, enabling scalable automated validation and improving system resilience.

**Relic Entertainment - SEGA**                                                      June 2022 - June 2023
*Associate Programmer - C++, Python*                                                      *Vancouver, Canada*
- Developed data-oriented gameplay systems within an Entity-Component-System architecture based on EnTT, focusing on cache efficiency for large-scale simulations.
- Designed and implemented a QuadTree spatial partitioning system and State Machine data structures, concurrently simulating 1600+ autonomous agents in a highly parallelized environment.
- Optimized multi-threaded StateTree data structures by 25%+, implementing highly performant squad-based AI behaviors.

**Microsoft - The Coalition Xbox**                                                   May 2021 - August 2021
*Software Engineer Intern - C++, Python*                                                  *Vancouver, Canada*
- Profiled and analyzed Unreal Engine 5's Chaos and Nanite systems, conducting performance benchmarking tests against Havok and PhysX to optimize real-time simulation on Xbox and PC.

**Ubisoft**                                                                          June 2020 - August 2020
*Generalist Programmer Intern - C++, C#, Python*                                           *Montreal, Canada*
- Designed a high-performance, voxel-based buoyancy simulation algorithm in an Entity-Component-System architecture, applying numerical integration methods to simulate real-time physical models.

## PERSONAL PROJECTS

**Cart-Pole Reinforcement Learning Agents**⚲ | C++
- Implemented PPO and REINFORCE agents from scratch in C++, reaching 500 maximum reward in sub 250 batches.
- Built Adam, SGD, and SGD with momentum optimizers, running comparative analysis on variation and convergence.
- Engineered a 2D physics engine with rigid bodies and joint constraints, and an SFML renderer for real-time visualization.

**Tiny-LLM**⚲ | Python, PyTorch
- Designed and trained a custom 51M-parameter decoder-only Transformer in PyTorch for next-token prediction, achieving a perplexity of 34 on WikiText-103 after 50,000 iterations.

**GPU-Accelerated Raytracer**⚲ | C++, CUDA, OpenGL
- Built a raytracer with CUDA and OpenGL interoperability, featuring progressive rendering for real-time visual feedback.
- Implemented anti-aliasing, depth of field, HDR tone mapping, a procedural skybox, and physically-based materials.

**Debris Disk Renderer**⚲ | C++, OpenGL
- Developed a software to visualize debris disks in 3D, used by the McGill Space Institute in the research of exoplanets.
- Optimized the engine with multi-threading and GPU programming, supporting different scattering functions.

## SKILLS

**Programming Languages:** C++, C, Python, Rust, Bash, Java, C#
**Tools & Libraries:** PyTorch, TensorFlow, CUDA, OpenGL, Unreal Engine, Unity, Git, Linux
**Languages:** English, French (Bilingual)