Robin Leman

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EDUCATION

University College London September 2025 - September 2026
MSc in Computational Statistics and Machine Learning. *London, UK*

- **Activities**: Head of ML Tutorials at the UCL AI Society. Organized weekly workshops covering core ML concepts.
- **Coursework**: Probabilistic and Unsupervised Learning, Approximate Inference, Bayesian Deep Learning, Supervised Learning, Reinforcement Learning, Generative AI, Open-Endedness and General Intelligence.

McGill University September 2019 - May 2022
BSc in Physics and Computer Science. CGPA: 3.82/4.00. *Montreal, Canada*

- **Activities**: President of GameDev McGill. Led a 10-people team to organize hackathons and events for 100+ members.

RESEARCH EXPERIENCE

Latent Dynamics Representations for Long-Horizon Consistency in World Models UCL
Supervisor: Jagmohan Chauhan (Dept of Computer Science) *Present*

- Investigating hierarchical latent representations and decoupled dynamics to reduce feature drift in world models.

Real Time Visualization of Debris Disks in Scattered Light and Thermal Radiation McGill University
Supervisors: Eve J. Lee (Dept of Physics), Clark Verbrugge (School of Computer Science) *2022*

- Simulated debris disk morphologies by numerically solving Kepler's equation with Newton's method, rendering up to 10^7 particles at 60 FPS, with 1.56s loading time leveraging multi-threading.

WORK EXPERIENCE

Electronic Arts July 2023 - September 2025
Software Engineer - C++ *Vancouver, Canada*

- Designed and implemented a high-performance Entity-Component-System library, optimizing memory layout for cache-efficient data access in highly parallelized simulations.
- Optimized cross-platform networking code for real-time replication, interpolation, and prediction, reducing memory usage.
- 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*

- Implemented spatial partitioning and state machine structures to accelerate nearest-neighbour queries for 1600+ entities.
- Optimized multi-threaded state tree data structures by 25%+, implementing highly performant squad-based AI behaviors.

Microsoft May 2021 - August 2021
Software Engineer Intern - C++, Python *Vancouver, Canada*

- Profiled UE5's physics systems, running performance analysis and benchmarks to optimize simulation on Xbox and PC.

Ubisoft June 2020 - August 2020
Generalist Programmer Intern - C++, C#, Python *Montreal, Canada*

- Designed a voxel-based fluid simulation algorithm for real-time buoyancy within a data-oriented architecture.

PERSONAL PROJECTS

Pico-Banana | Python, Pytorch

- Built a 10M-parameter diffusion model (DDPM) featuring a U-Net with sinusoidal embeddings and bottleneck attention.
- Optimized training stability using an EMA update strategy and a cosine noise schedule to improve sample fidelity.

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 variance and convergence.

Tiny-LLM | Python, PyTorch

- Built and trained a 51M-parameter transformer in PyTorch, achieving a perplexity of 34 on WikiText-103 after 50k iters.

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.

SKILLS

Python, PyTorch, C++, CUDA, C, Rust, Bash, Java, C#, TensorFlow, OpenGL, Unreal Engine, Unity, Git, Linux