Finnley Howald

437-345-5152 | finnley.howald@gmail.com | linkedin.com/in/finnley-howald | github.com/Finnley111

Education

McGill University 08/2022 – 05/2026
Bachelor of Science in Computer Science (GPA: 3.90/4.0) *Montreal, QC*

Experience

Research Assistant 05/2025 – Present
The Rosalind and Morris Goodman Cancer Institute – McCaffrey Lab *Montreal, QC*

- **Trajectory Inference from CNN-Derived Cell Morphology**
  - Conducting preliminary experiments to detect meaningful morphological correlations in cell-image patches using diffusion maps and UMAP.
  - Comparing multiple CNN backbones (ResNet-18/50/101, Phikon, Phikon-v2) to evaluate embedding quality and sensitivity to subtle morphological change.
  - Partnering with oncology/pathology researchers and CS faculty for success metrics and evaluation protocols.
- **HistoCell Pipeline for Histology Images**
  - Built an end-to-end ML pipeline using HistoCell (a weakly-supervised deep learning framework) for slide-level cancer detection across lab datasets.
  - Scaled training/inference on Narval (Canada's national research high-performance computing cluster): created batch-scheduled job templates.

Research Assistant 05/2024 – 05/2025
McGill University (Department of Psychology) – Britt Lab *Montreal, QC*

- Built and tested reinforcement learning models (Q-Learning, Double Q, Choice Kernel, Forgetting) to study probabilistic decision-making in mice; identified Double Q with Forgetting as the strongest fit.
- Developed a Python pipeline to clean, compile, and simulate behavioural data, including generating synthetic datasets for model evaluation.
- Optimised hyperparameters to improve model reliability and parameter recovery.

Research Assistant 02/2023 – 04/2024
The Rosalind and Morris Goodman Cancer Institute – McCaffrey Lab *Montreal, QC*

- Implemented basic CompuCell3D simulations (e.g., simple lumen formation and macrophage interactions) to understand how cellular behaviour is represented in a cell-based tissue model.

Volunteer 07/2022 – 09/2022
Mount Sinai Hospital – Cardiology Lab *Toronto, ON*

- Built a GUI that enabled non-technical staff to run analyses on cardiac pressure data independently.

Projects & Activities

McHacks Workshop Coordinator and Speaker

- Led/coordinated 10+ workshops throughout McGill's largest annual hackathon (Git/Bash, Cybersecurity, ML, and more).

Ray Tracer

- Developed a modular ray tracing engine in Taichi, implementing high-performance intersection kernels for spheres, planes, AABoxes, and triangle meshes.
- Developed a complete shading pipeline implementing Lambertian diffuse and Blinn-Phong specular models, alongside quadratic attenuation and occlusion testing via shadow rays.
- Implemented stochastic area lights for soft shadows, depth-of-field blur, environment mapping, and Perlin noise-based surface perturbation.

Technical Skills

Programming Languages: Python (NumPy, Pandas), C/C++, Java, JavaScript, HTML/CSS
Machine Learning: PyTorch, scikit-learn, Matplotlib; experiment tracking & evaluation
Tools: Adobe Creative Cloud, Unity
Languages: English; French (Intermediate)