Finn Vamosi

(587) 436-2196 – finn.vamosi@ucalgary.ca – https://finnvamosi.github.io/

EDUCATION

Bachelor of Science in Computer Science *(GPA: 3.90)*

University of Calgary; Canada — 2021 – 2025

University of Texas at Austin; USA — Fall 2024

PUBLICATIONS

Vamosi, F. G., & Forkert, N. D. (2025). CRAwDAD: Causal Reasoning Augmentation with Dual-Agent Debate. In *International Conference on Autonomous Agents and Multiagent Systems*. (**Under review**)

Stanley, E. A. M., Vigneshwaran, V., Ohara, E. Y., **Vamosi, F. G.**, Forkert, N. D., & Wilms, M. (2025). Synthetic Ground Truth Counterfactuals for Comprehensive Evaluation of Causal Generative Models in Medical Imaging. In *International Conference on Medical Image Computing and Computer-Assisted Intervention* (pp. 541–550). Springer Nature Switzerland Cham.

Ohara, E. Y., Vigneshwaran, V., Souza, R., **Vamosi, F. G.**, Wilms, M., & Forkert, N. D. (2025). Dimensionality reduction in 3D causal deep learning for neuroimage generation: an evaluation study. *Journal of Medical Imaging*, *12*(2), 024506–024506.

Ohara, E. Y., **Vamosi, F.**, Patil, H., Vigneshwaran, V., Wilms, M., & Forkert, N. D. (2024). MACAW 3D: a masked causal normalizing flow method for counterfactual 3D brain image generation. In *Medical Imaging 2024: Imaging Informatics for Healthcare, Research, and Applications* (Vol. 12931, pp. 110–115). SPIE.

SCHOLARSHIPS & AWARDS

Data Processing Management Association Prize ($400) — 2025

Killam Fellowship (USD$6,750) — **2024**

Jason Lang Scholarship ($1,000) — 2023 and 2024

Louise McKinney Scholarship ($2,500)   2022
Schulich Leader Scholarship ($80,000)   **2021**
President's Admission Scholarship ($5,000)   2021
Alexander Rutherford Scholarship ($2,500)   2021
Arts and Science Honours Academy Entrance Scholarship ($1,000)   2021

Alberta Innovates Summer Research Studentship ($7,500)   2023
NSERC Undergraduate Student Research Award ($7,500)   2022, 2024, and 2025
Dean's List   4x Recipient, 2021-25

RESEARCH EXPERIENCE

Thesis Research, Dr. Tyler Bonnell   2024 – 2025
University of Calgary, Faculty of Science
Project title: One-Life Reinforcement Learning in Naturalistic Environments
- Learned reinforcement learning theory from online courses and textbooks
- Compiled thorough literature review of associative learning as it relates to RL
- Implemented Gymnasium environment with environmental shaping and dynamism, making for a more naturalistic learning setup
- Adapted a novel associative learning formulation for continual learning
- Conducted several experiments of both standard and continual RL
- Wrote full research report and presentation, earning an A in the thesis course

Research Assistant, Dr. Nils Forkert   2023 – 2025
University of Calgary, School of Medicine
Project title: CRAwDAD: Causal Reasoning Augmentation with Dual-Agent Debate
- Compiled thorough literature review of causality understanding in LLMs and multi-agent debate effectiveness across domains
- Set up DeepSeek-R1 and Qwen3 reasoning models using Ollama
- Constructed framework for both models to debate the answer to causal inference questions from the CLadder dataset
- Observed substantial increases in final answer accuracy after engaging in debate

Project title: Evaluating Causal Counterfactual Generation in Medical Imaging
- Developed an experimental pipeline to assess causal machine learning models, such as the recently proposed MACAW
- Utilized the novel SimBA synthetic dataset generation tool to systematically and empirically evaluate MACAW's attempts at bias removal

- Employed PCA dimensionality reduction and trained the model in several components to reduce memory usage and accelerate model convergence
- Conducted quantitative analysis through MSE comparisons between image sets
- Trained a specialized CNN to assess counterfactual image quality and determine if MACAW had successfully removed the target bias
- Explored visual debugging techniques for identifying failure modes in causal medical image generation models

Project title: Deep Learning Age Prediction of Causally-Generated Brain Scans
- Filtered datasets to remove subjects with conditions affecting brain physiology to normalize training data
- Trained a machine learning model to accurately predict the ages of individuals based on their 2D or 3D brain MRI scans
- Accelerated training by configuring code to run on a remote computing cluster
- Presented the basics of Stable Diffusion to colleagues to introduce them to the new deep learning technique

Research Assistant, Dr. Christian Jacob   2019 – 2022
University of Calgary, Faculty of Science
Project title: Immersive Cell Biology Education in Virtual Reality
- Developed an immersive virtual reality (VR) experience in Unreal Engine 4 for teaching cell biology in a memorable and approachable way
- Designed, edited, and animated unique 3D models in Blender for my project and those of other undergraduate students
- Developed an engaging VR game in which the player assumes the role of a Cytotoxic T cell in the bloodstream
- Implemented best practices of VR game development to reduce discomfort while playing and improve immersion

VOLUNTEER EXPERIENCE

Food Bank Volunteer   2022 – 2024
University of Calgary, Students' Union
- Interviewed clients about their personal details and food preferences
- Packed hampers according to the specific preferences of clients, and authenticated clients upon arrival
- Mentored new volunteers to accelerate the onboarding process

Communications Team Member 2021 – 2022
CalgaryToSpace *(Student team working to launch a satellite into space)*
- Developed the software framework for transmitting information back and forth between the satellite and our ground station
- Constructed web dashboard for displaying satellite telemetry in near real-time
- Applied for international clearance to operate within specific radio frequencies

Robotics Team Lead 2020 – 2021
William Aberhart High School
- Redesigned the team's outdated website with a focus on ease of use and accessibility
- Implemented control software to ensure robot executed automated tasks correctly, and responded accurately to human control
- Delegated tasks according to skill sets and interests, and coordinated meetings to keep development on track

Volunteer Instructor 2020
Under The GUI Academy *(Tutoring organization dedicated to Computer Science education)*
- Taught young children basic programming concepts

SKILLS

Languages: English (Native), French (Fluent)
Programming: Python, PyTorch, Java, R, HTML, CSS, JavaScript, Assembly, Haskell
Software: Unreal Engine 4, Unity, Blender, LaTeX, Mathematica, Unix, Cluster Computing, Excel, Tableau

RESEARCH INTERESTS

AI alignment, safety, interpretability, explainability, fairness, and robustness

MEMBERSHIPS

Artificial Intelligence Club 2023 – present
Data Science and Machine Learning Club 2022 – present