

Alex Guo

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EDUCATION

University of Waterloo and Wilfrid Laurier University 2023 – 2028 (Expected)

Bachelor of Computer Science and Bachelor of Business Administration

- Relevant Coursework: Object Oriented Software Development, Data Structures, Intro Algorithms, Tools and Techniques for Software Development, Probability, Optimization

EXPERIENCE

Software Developer Intern May 2025 – August 2025

Emergent Vision Technologies

- Developing a Linux kernel module to intercept and decode GVSP (UDP) packets, sending image data directly to user buffers
- Optimizing TCP request and reply model in eCapturePro (a distributed system for remote camera control), including a C++ serialization protocol, resulting in 10x smaller transmissions and improved memory safety

GPU Software Developer Intern May 2025

InfinityQ Technology

- Worked with researchers to develop a numerical solver for coupled first-order ODEs using adaptive backward differentiation

Undergraduate Research Assistant Jan 2025 – May 2025

Porous Materials Engineering & Analysis Lab (PMEAL)

- Wrote performant parallelized random walk algorithms in C for 2D and 3D images, with a Python interface for PoreSpy, PMEAL's library for quantitative image analysis of porous materials
- Set up CI/CD pipeline with GitHub actions to build dynamic libraries and deploy platform specific wheels for Windows, Linux, and MacOS

Software Developer Intern May 2024 – August 2024

Emergent Vision Technologies

- Developed image processing algorithms in C++ for eSDK (Linux and Windows), the primary toolkit for all internal and external users to interact with Emergent cameras, utilizing object-oriented design and parallelism to achieve a 5x performance improvement
- Wrote CUDA kernels to create live projections from fisheye lenses to panoramic and “little planet” displays capable of streaming at more than 100Gbit/s
- Created a suite of tools utilizing PyTorch to train a machine learning (R-CNN) model to detect defects on products moving along a conveyor belt with over 95% accuracy

PROJECTS

Computer Algebra | C++ September 2024 - December 2024

- A C++ command-line algebra system, with a tokenizer and recursive descent parser to read expressions into a syntax tree: supports expression evaluation, simplification, and symbolic differentiation

TECHNICAL SKILLS

Languages: C, C++, Python, CUDA

Tools and Libraries: Qt, QML, OpenCV, PyTorch, NumPy, Git, Shell Scripting, CMake