

Alex Guo

alexguoxh@gmail.com | [linkedin.com/in/guoalex](https://www.linkedin.com/in/guoalex) | <https://github.com/guoalex1>

EDUCATION

University of Waterloo and Wilfrid Laurier University 2023 – 2027 (Expected)

Bachelor of Computer Science and Bachelor of Business Administration

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

EXPERIENCE

Fall 2025 Undergraduate Research Assistant September 2025 – December 2025

University of Waterloo

- Developing an extension in C to neper (Linux networking performance tool) to integrate AF_XDP communications

Software Developer Intern May 2025 – August 2025

Emergent Vision Technologies

- Developing a Linux kernel module in C to intercept and decode GVSP (UDP) packets with netfilter, sending image data directly to userspace memory at the prerouting stage
- Optimizing TCP request and reply model in eCapturePro (a modern C++20 distributed system for remote camera control), 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 in Python for coupled first-order ODEs using an adaptive backward differentiation algorithm

Undergraduate Research Assistant January 2025 – April 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 users to interact with Emergent cameras, utilizing object-oriented design and multithreading to achieve a 5x performance improvement
- Wrote CUDA kernels to create live projections from fisheye lenses to panoramic and “little planet” (stereographic projection) 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 blister packs moving along a conveyor belt with over 95% accuracy

PROJECTS

Computer Algebra | C++

- 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 and tools: C, C++, Python, CUDA, Git, Bash and PowerShell scripting