David Gurevich

dgurevich@uwaterloo.ca
(416) 414 0515
gurevich.ca

Technical Skills

- **Languages**: Python, C++, C, Rust, MATLAB, Scheme, SQL, Shell scripting
- **Libraries**: NumPy, SciPy, Pandas, PyTorch, Matplotlib, Flask, OpenCV, FFTW, CTypes
- **Tools/Environments**: Git, Vim, JetBrains IDEs, gdb, Docker, CMake, Buildroot, RFNoC

Education

University of Waterloo — Waterloo, ON
Candidate for Bachelor of Mathematics, Computer Science — *Expected Graduation: April 2025*

- *Extracurricular Research*: Within OpAL Lab, investigated the efficacy of large language models like LLaMA in performing graph clustering tasks.

Experience

MathWorks, Inc — Glasgow, UK
Software Engineer in Test Intern — *May 2023 - August 2023*

- Improved open-source UHD hardware simulator with **Python**, enriching its versatility and speed for cost-effective testing. Enabled dynamic re-routing of RFNoC radio signal processing blocks during tests.
- Enhanced the **C++** based high-speed data acquisition interface, ensuring accurate performance benchmarking and optimal system evaluation.
- Consolidated several RF processing chains to reduce the number of **FPGA** bitstreams required for building and testing MATLAB Wireless Testbench by 50%, resulting in a 4+ hour reduction in daily build time.

Microchip Technologies, Inc — Toronto, ON
Software Engineering Intern — *September 2022 - December 2022*

- Responsible for porting and documenting SmartHLS FPGA high-level synthesis build system from Makefiles to **Python**, allowing for Windows compatibility and improved maintainability.
- Implemented improvements and developed data structures in **C++** which eliminated non-determinism in LLVM-based synthesis from C/C++ to Verilog, allowing for improved integration testing.

Applied Mind, Inc — Ottawa, ON
Software Development Intern — *January 2022 - April 2022*

- Performed novel research to design and implement sensor fusion algorithms (using **Kalman filter**, TDOA) in **Python** to eliminate error in RF emitter location estimates from 2 meters to 0.5 meters.
- Designed and implemented high-speed data streaming application for **embedded Linux** system in **Rust** within soft real-time performance constraints.

Applied Mind, Inc — Ottawa, ON
Embedded Software Development Intern — *May 2021 - August 2021*

- Developed multithreaded radio signal acquisition software in **Rust** to receive and process LTE signals at over 60 MS/s.
- Made use of **DMA** and **CPU caching** in order to transfer received data from FPGA to processor at over 1 GB/s.
- Designed and deployed custom Continuous Integration workflow for embedded software using GitHub Actions.
- Implemented Linux userspace drivers in **Rust** and **C** for radios and high-performance clocks.

Projects

3D Sound Synthesis: Localize audio to a particular location around the listener.
C++ (STL, FFTW, CMake), MATLAB

- Designed a custom algorithm for 3D sound synthesis, given a position on the unit sphere using various **DSP** methods.
- Prototyped in **MATLAB**, with final implementation in **C++**.

Cross-Correlation Fluid Flow Meter: Low-cost signal acquisition and processing system for ultrasonic fluid flow measurement.
Python (NumPy, Matplotlib, SciPy), C++, MATLAB

- Developed high throughput, multi-threaded **Python** application for acquisition and processing of ultrasonic signals within strict operational requirements.
- Collaborated on and prototyped custom signal processing algorithms in **MATLAB**, with implementation in **C++**