David Gurevich

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Technical Skills

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

Education

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

Experience

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

- 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
- Worked on a team of a dozen engineers to help fix bugs submitted by customers

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

- Performed novel research to design and implement optimal algorithm for signal emitter localization
- Implemented sensor fusion algorithms (**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

Radar-based Drone Identification: Novel machine learning based approach to the identification of drones from radar signals
Python (NumPy, Matplotlib, SciPy, TensorFlow)

- Developed a novel approach to the identification of drone types from noisy radar signals
- Approach won second place in competition organized by CANSOFCOM, DRDC, and Hack The North
- Utilized **TensorFlow** to fit a CNN classification model based on state of the art research

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 high frequency analog signals within strict operational requirements
- Collaborated on and prototyped custom signal processing algorithms in **MATLAB**, with implementation in **C++**