David Gurevich

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Technical Skills

- **Languages**: Python, C++, C, Rust, MATLAB, Scheme, SQL, Shell scripting
- **Libraries**: NumPy, SciPy, Pandas, PyTorch, TensorFlow, sklearn, Matplotlib, Flask, OpenCV, FFTW, CTypes

Education

University of Waterloo Waterloo, ON

Bachelor of Mathematics in Computer Science and Computational Mathematics *Expected Graduation: April 2025*

Cumulative Average: 86%

- ***Quickest Change Detection***: Performed supervised research on non-parametric quickest changepoint detection of high-dimensional data on low power systems.
- ***Spiking Neural Networks***: Investigated ability of spiking neural networks in solving certain classes of partial differential equations on neuromorphic hardware.
- ***LLM Research***: Investigated the efficacy of LLM's like LLaMA in performing graph clustering tasks.

Experience

Enlighted – Siemens AG Waterloo, ON

IoT Research Intern *January 2024 - April 2024*

- Independently researched and developed a data-efficient **LSTM**-based approach to perform RSSI-based localization of Bluetooth Low Energy (BLE) assets using **TensorFlow**.
- New machine learning-based approach achieves accuracy of 2 metres, compared to 4.5 metre accuracy of previous solution, with improved trajectory estimation and decreased time delay.
- Developed data-driven **channel estimation** utilities to facilitate conversion from signal strength (dBm) to distance.
- Developed and integrated a robust Kalman filter using **Python**, **Redis**, and **MongoDB**, accessible via **FastAPI**.
- Performed mathematical analysis on optimal estimators (CRLB) and filters (Kalman) to establish benchmarks.

MathWorks, Inc Glasgow, Scotland

Software Engineer in Test Intern *May 2023 - August 2023*

- Improved open-source UHD hardware simulator with **Python**, enriching its versatility for cost-effective testing.
- 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** to interface with radios and jitter attenuators over SPI and I2C.