

TECHNICAL SKILLS

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

EXPERIENCE

Research in Flows, Inc

Software Engineer

Brampton, ON

February 2018 - September 2020

- **Research and Development:** Responsible for the ground-up architecture and development of a low-cost digital phase demodulation system for high frequency signal analysis in industrial applications
- **High Performance:** Developed a high-throughput, multi-threaded Python application for acquisition and processing of high frequency analog signals within strict operational requirements
- **Digital Signal Processing:** Collaborated on and prototyped custom digital signal processing algorithms in MATLAB with final implementation in C++
- **Low-Cost Design:** Worked within strict budget requirements to source OEM hardware that is cheaper than competition, but delivers improved results

York University

Research Assistant

Toronto, ON

January 2019 - August 2019

- **Mathematical Research:** Conducted original epidemiological research to design an ODE model to simulate the dynamics of a measles outbreak in secondary schools, with implementation in MATLAB
- **Computational Model:** Designed and implemented an Agent-Based Model alternative to the ODE model in C++ with improved accuracy and realism
- **Software Optimization:** Implemented certain improvements in C++17 software (multi-threading, data structure optimization) to improve execution time by a factor of over 17,000, saving days of compute time
- **Conference Planning:** Supported the planning of the 2019 Annual Society for Mathematical Biology meeting. Developed Python and Shell scripts to automate repetitive tasks

PROJECTS

- **3D Sound Synthesis:** Make any sound appear as though it is coming from somewhere else
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 memory efficient implementation in well documented C++ code
 - Performed an extensive literature survey to determine the state-of-the-art in 3D sound synthesis
- **Trading Bot:** Python implementation of custom stock trading algorithm and backtesting system
Python (NumPy, Pandas, Matplotlib)
 - Custom algorithm performs at or above market levels in almost all cases – as much as 220% above market
 - Developed mathematical method for prediction of scale of asset growth
 - Designed custom strategy backtesting framework for easier evaluation
 - Investigated and evaluated various data analysis techniques

EDUCATION

University of Waterloo

Candidate for Bachelor of Mathematics, Computer Science

Waterloo, ON

Expected Graduation: 2025

GPA: 3.90/4.00