Omar Elrefaei

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Professional Experience

Bank of Canada, Software Engineer Jan 2023 – Aug 2023

Worked on a next-gen macroeconomic modeling suite in Julia.

- Optimized memory allocations for specialized operations by interfacing with Fortran LAPACK.
- Drafted engineering recommendations regarding code auto-differentiation libraries.
- Asserted robustness of numerical routines through careful **unit-testing**.
- Developed **graphical plotting** for new forecasting methods.
- Deployed legacy matlab codebase on a **Linux HPC** SLURM cluster.

Lumentum, Optical Testing Software Developer Sep 2021 – Mar 2022

Lead the development of an in-house data processing tool using **C#, dotnet, and SQL**.

- Processed over 200,000 hardware testing results into an analytics database.
- Achieved 80% reduction in ingress time by batching the **SQL transactions.**
- Designed an in-house **WinForms GUI** for previewing and cleaning the parsed data.
- Maintained data integrity when importing noncompliant files with fail-safe parsing.
- Enhanced design workflow by dispatching jobs to simulation toolkit using **Python API.**

Alolom, Software Developer May 2020 – Aug 2020

- Deployed JupyterHub through **Github CI/CD** using **Docker** and Kubernetes.
- Developed tools for automated **Python AST** source-code transformations.

Education

University of Waterloo, BASc Nanotechnology Engineering 2019 – 2024

Highlighted Coursework:

- Numerical Methods (Python, scipy, numpy)
- Statistical Regression and Forecasting (R, tidyverse, ggplot2, glmsdata)
- Systems and Performance programming (C, Rust, Linux, SIMD, GPU-CUDA, profiling)

Open Source Contributions

Symbolic Quantum Computing project - paid contract:

- Assert code quality by integrating type-system analysis in test suite. (link)
- Develop library benchmarks for automated performance tracking. (link)

Molly Molecular Simulation project:

- Rewrite molecular bonding constraints algorithm to run efficiently on CUDA GPU.

Other Skills

- Comfortable - linux provisioning, flamegraphs profiling, gdb debugging
- Other tools I've used - PyQt, R, Powershell, matplotlib, scipy, pandas, gcc, valgrind, apt/dpkg