(Robert) Cameron Rutherford

HPC/ML/Q Research Software Engineer

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cameronrutherford Robert C Rutherford

Summary

High Performance Computing (HPC) / Machine Learning (ML) / Quantum (Q) Research Software Engineer (RSE) with over 3 years of experience deploying, testing, optimizing and teaching people about scientific software and computing systems. I have worked on a wide variety of projects during my time at “the lab”, and have had my code run on everywhere from the largest supercomputer in the world, to a novel quantum computer.

Skills

C / C++17	**Python**	**DevOps**
CMake, Spack, CUDA / HIP	Pytorch, JAX, Distributed ML	Docker, ghcr, S3
RAJA + Umpire / Kokkos	conda, poetry, mamba	Singularity/Apptainer, charliecloud, podman
MPI, pybind11, toml11, spdlog	quarto, nbdev, qiskit	GitHub, GitLab, pre-commit

Experience

Software Engineer HPC/ML/Q, Pacific Northwest National Laboratory (Virtual) **2020 - Present**

- Lead Software Stack for ExaSGD project through key Frontiner deployment to 8k nodes and 54k GPUs
- MLOps internal offering lead developing containerisation and best practices community
- On-boarding and support experience for both HPC Clusters and IBMQ systems
- Deployed ML software stack for various projects, and assisted in building continuous integration pipelines
- Lead Privacy Preserving ML project to explore FHE, FL, DP and SMC

Sports Events Coordinator, Whitworth University (Spokane, WA) **2019 - 2020**

IT Intern, Mac Management, Keysight Technologies (Colorado Springs, CO) **2018**

Calculus III Grader / Mathematics Tutor, Whitworth University (Spokane, WA) **2017, 2019**

Basketball Coach, S.G.S. & M.L.C (Sydney, AUS) **2015**

Publications

- S. Abhyankar, S. Peles, **R. Rutherford**, A. Mancinelli, **Evaluation of AC optimal power flow on graphical processing units.** (IEEE PESGM 2021)
- S. Peles, M. Alam, A. J. Mancinelli, K. Perumalla, **R. C. Rutherford**, J. Ryan, C. G. Petra, **Porting the Nonlinear Optimization Library HiOp to Accelerator-Based Hardware Architectures** (arxiv 2021)

Conferences

Practice and Experience in Advanced Research Computing (PEARC) **2023**

Pacific Northwest National Laboratory (PNNL) Tech Fest **2021-2023**

Energy Exascale Earth System Model (E3SM) Annual Meeting **2023**

Sustainable Tools Ecosystem Project (STEP) East Coast Town Hall **2023**

Exascale Computing Project (ECP) Annual Meeting **2021-2023**

Pacific Northwest National Laboratory (PNNL) Innovation Summit **2022**

Co-Design Centre for Quantum Advantage (C2QA) Annual Meeting **2022**

Education

Scientist & Engineer Rising Leader Learning Journey **2023**

Cyber Security & National Security Seminar Series, PNNL **2021 - 2022**

Whitworth University, B.S. Mathematics and Computer Science **G.P.A 3.9/4.0**

- Outstanding Mathematics Major 2020
- ICPC Pacific Northwest Eastern Washington Site Winner 2018
- Howard R. Gage Memorial Scholarship 2017, 2018, 2019

Other Activities

Sustainable Horizons Institute HPC Mentor **2022, 2023**

Quantum Information Science / HPC STEM Mentor **2022 - Present**

Whitworth Chess Club President **2019 - 2020**

Pine Codes Hackathon Winner **2019**

SpokAnimal Shelter Volunteer **2019**

Whitworth Men’s Basketball Team **2016 - 2019**