Joseph McLaughlin

Computer science PhD student.
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PUBLICATIONS

McLaughlin J., Choi J., Durairajan R., ×Grid: A Location-oriented Topology Design for LEO Satellites. LEO-NET 2023–1st International Workshop on LEO Networking and Communication at ACM MobiCom 2023, Madrid, Spain, 2–3 October, 2023

McLaughlin, J., Young M., Rockcastle S., Fine-grained measurement of the indoor built environment with robotic vacuum cleaners, BS2021–17th International Conference of the International Building Performance Simulation Association. Bruges, September 1–3, 2021

Flores J., Fuentes R., **McLaughlin, J.**, Novitzky K., Schofield S., Springel A., Tal S., Pipeline Trees - An Auxiliary Tool in the Creation of Time Series Pipelines, ITISE2021, International Conference on Time Series and Forecasting, 19–21 July, 2021

TECHNICAL REPORTS

McLaughlin J., A high performance characterization of hybridized PDEs, Technical report, University of Oregon, December 10, 2023.

McLaughlin J., Scoping study: high-efficiency X-ray sources for STARBRIGHT. Lawrence Livermore National Laboratory (LLNL) internal audience, publicized 2023 September 12.

EDUCATION

PhD, Computer Science, University of Oregon. Fall 2021 – **Ongoing**.
Advised by Jee W. Choi. Focus in parallel algorithms, tensor algorithms, numerical methods.
Instructor for CS 330, C/C++ programming.

MS, Computer Science, University of Oregon. Graduated Spring 2021.
Focus in parallel algorithms, autonomous sensing, compiler design.
Thesis: Analysis of a mobile computing system for indoor environmental monitoring.

BS, Computer Science, University of Oregon. Graduated Spring 2017.
Focus in compilers, high-performance computing, computer graphics.

RESEARCH APPOINTMENTS

Student Researcher, Sandia National Laboratories. January 2023 – **Ongoing**.
Remote.

- Researched multi-precision floating point optimizations for dense tensor decomposition methods.
- Designed and implemented tensor decomposition methods on GPU tensor cores for a notable speedup.
- Participated in ongoing roundtable discussions with scientists at Sandia .

Research Intern, Lawrence Livermore National Laboratories. June 2023 – September 2023.
Livermore, California.

- Implemented numerical ALE models targeting X-ray ground-coupling for asteroid defence applications.
- Determined optimal conditions of experimental parameters in X-ray ground-coupling simulations and proposed new directions for future models.
- Conducted and presented research on the runtime performance of particular numerical methods.

Research Intern, NASA Langley Research Center. May 2022 – January 2023.
Remote.

- Built high-performance C and CUDA code in support of the ongoing NASA Artemis mission and future Mars missions.
- Achieved 20x runtime performance improvements over existing serial C code utilizing high-performance computing cluster resources.
- Researched Monte Carlo methods for uncertainty quantification supporting ongoing research.

PROFESSIONAL EXPERIENCE

Senior Software Engineer, Kayhan Space. April 2020 – August 2021.
Remote.

- Bootstrapped an initial software product on a team of two, including frontend/backend APIs, database models, and high-performance simulation software.
- Deployed software product on AWS with Kubernetes and through a Gitlab CI/CD.
- Implemented high-performance simulations of satellite orbits in C++ and CUDA.
- Interviewed and onboarded candidates for engineering roles.

Software Engineer, Datalogic. October 2017 – September 2019.
Eugene, Oregon.

- Maintained software for a USB driver by addressing bugs, implementing additional features.
- Convened with customers and stakeholders to determine which features and bugs were critical.
- Coordinated sprint planning in a small team within a sprint planning framework.
- Evaluated customer needs and built prototype products as part of a new-product development group.

SERVICE

GEC Student Appointee, Department of Computer Science. August 2023 – **Ongoing**.
Eugene, Oregon.

GTFF Steward, Graduate Teaching Fellow Federation. September 2022 – **Ongoing**.
Eugene, Oregon.

Student Volunteer, Supercomputing conference. November 2022.
Eugene, Oregon.