

Michael McKinsey

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Education

- 2024 **M.S. Computer Science**, Texas A&M University, GPA – 3.8.
Using Parallel Performance Data to Classify Parallel Algorithms. Advisor: Dr. Olga Pearce
- 2022 **B.S. Computer Science**, Texas A&M University, GPA – 3.8.
Minor in Mathematics

Experience

- 2022– **Graduate Student Intern**, LLNL, PAVE.
- Present
- Collaborated with a team of 10+ developers on [Thicket](#), an open-source performance analysis tool, contributing over 100 pull requests (GitLab & GitHub), totalling 10,000+ lines of code.
 - Created 50+ unit tests with [Pytest](#), contributing to an 82% overall code coverage.
 - Developed multiple tutorial notebooks for the [Thicket tutorial](#), showcasing tool functionality and teaching new users how to utilize the tool.
 - Integrated the reading of [Caliper](#) and [Nsight Compute](#) performance profiling data, and the [Extra-P](#) performance modeling tool in [Thicket](#).
 - Instrumented the [RAJA Performance Suite](#) with [Caliper](#), a performance profiling tool for HPC applications, enabling exploratory data analysis (EDA) with [Thicket](#).
- 2022– **Teaching Assistant**, TEXAS A&M UNIVERSITY, Computer Science & Engineering.
- 2023 CSCE 435 Parallel Computing TA for Dr. Olga Pearce (193 students, Fall '22 & '23):
- Maintained and tested installs of [Caliper](#), [Thicket](#), and Python on the Grace cluster for students to use in their parallel programs.
 - Updated parallel code assignments with performance profiling ([Caliper](#)), for an introduction to performance analysis with [Thicket](#) for various programming models (OMP, MPI, and CUDA).
 - Created instructional material and examples for students to collect parallel performance data for different parallel sorting algorithms and conduct performance analysis.
 - Created and maintained repositories for the class materials (parallel programs, build instructions, and analysis notebooks) for future teaching assistants and graders to leverage.
- 2021 **Software Engineering Intern**, WORKRISE, Engineering Enablement.
- Incorporated [Tonic](#), a data generation and security tool, into the Workrise software infrastructure, deploying via Kubernetes ([GKE](#)) with [Helm](#), and managing resources with [Terraform](#).
 - Improved user accessibility by creating scripts to make [Docker](#) containers from the [Tonic](#) databases, and created self-service documentation for developers to connect their databases.
- 2020 **Software Engineering Intern**, WORKRISE, Data Engineering.
- Deployed [Amundsen](#), an open source data discovery tool, using [GCP](#) and Workrise's data platform in [Snowflake](#), collaborating with Business Intelligence to identify important data.
 - Generated custom usage statistics using real user data in [Snowflake](#) with SQL, and ingested them into [Amundsen](#) for analysis.
- 2019– **Student Security Analyst**, TEXAS A&M UNIVERSITY, IT Security Operations.
- 2020
- Developed a Python program based on an automated security report to correctly identify 80% of the reports as false positives, saving a significant amount of time for Security Analysts.
 - Assisted to manage and train Junior Student Security Analysts and worked alongside a team of 10+ Student Security Analysts.

Publications

- [1] Olga Pearce, Jason Burmark, Rich Hornung, Befikir Bogale, Ian Lumsden, **Michael McKinsey**, Dewi Yokelson, David Boehme, Stephanie Brink, Michela Taufer, and Tom Scogland. "RAJA Performance Suite: Performance Portability Analysis with Caliper and Thicket". In: *ACM/IEEE International Conference for High Performance Computing, Networking, Storage, and Analysis*. Supercomputing. 2024.
- [2] **Michael McKinsey**, Stephanie Brink, and Olga Pearce. "Using Parallel Performance Data to Classify Parallel Algorithms". In: *Proceedings of the 15th International Conference on Parallel Processing & Applied Mathematics*. PPAM. 2024.
- [3] Stephanie Brink, **Michael McKinsey**, David Boehme, Connor Scully-Allison, Ian Lumsden, Daryl Hawkins, Treece Burgess, Vanessa Lama, Jakob Lüttgau, Katherine E. Isaacs, Michela Taufer, and Olga Pearce. "Thicket: Seeing the Performance Experiment Forest for the Individual Run Trees". In: *Proceedings of the 32nd International Symposium on High-Performance Parallel and Distributed Computing*. HPDC. 2023.

Coursework

- Graduate**
 - ML – Deep Learning, Deep Reinforcement Learning, Large-scale Opt. for ML
 - CS – Computer Architecture, Theory of Computability
 - STAT – Distribution Theory, Regression Analysis
- Undergrad**
 - ML – Machine Learning, Artificial Intelligence
 - CS – Parallel Computing, Operating Systems, Analysis of Algorithms, Data Structures & Algorithms
 - MATH – Linear Algebra, Discrete Mathematics, Calculus I-III, Communications and Cryptography I & II, Differential Equations

Service

- 2024 **Student Volunteer**, *The International Conference for High Performance Computing, Networking, Storage, and Analysis*, (SC), Atlanta, GA.
- 2022 **Student Volunteer**, *The International Conference for High Performance Computing, Networking, Storage, and Analysis*, (SC), Dallas, TX.

Skills

- Languages Python, C++
- Prog. CUDA, MPI, OpenMP
- Models
- Tools
 - DATA – Matplotlib, NumPy, Pandas
 - PERF – Caliper, Hatchet, Thicket
 - ML – PyTorch, Scikit-Learn
 - DEVOPS – Airflow, GCP, Docker, Pytest, Snowflake, Terraform
- HPC Slurm, LSF
- Misc. Shell, CMake, Git, \LaTeX , Linux