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

Skills

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

Experience

2022–Present **Graduate Student Intern**, LAWRENCE LIVERMORE NATIONAL LABORATORY.
- 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 4 Python notebook tutorials 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.

2022–2023 **Teaching Assistant**, TEXAS A&M UNIVERSITY, Computer Science & Engineering.
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 infrastucture, 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.