Michael McKinsey

Curriculum Vitae

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Research Interests

- High-Performance Computing
- Machine Learning & AI
- Performance Tools
- Performance Profiling, Analysis, & Visualization

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–Present **Graduate Student Intern**, LLNL, PAVE.

- Main developer and maintainer for Thicket, an open source performance analysis tool for exploratory data analysis (EDA) of multi-run performance data. I developed the core operations that enable composition of multi-dimensional performance data, and integrated with performance profilers such as Caliper and Nsight Compute to compose multi-platform performance data. Additionally, I developed support for external toolkits such as Extra-P for performance modeling.
- Instrumented the RAJA Performance Suite with Caliper, a performance profiling tool for HPC applications, enabling exploratory data analysis (EDA) with Thicket. I also maintain Caliper support and build scripts in RAJAPerf.

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):

- Helped to design instructional material and examples for students to collect parallel performance data for different parallel sorting algorithms and conduct performance analysis.
- Updated assignment materials with performance profiling (Caliper), to give students an introduction to performance analysis with Thicket on HPC for various programming models (OpenMP, MPI, and CUDA).
- Improved assignment rubrics including grading criteria and detailed explanations of expected results 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.
- Connected several production databases, and created self-service documentation for developers to connect their databases to Tonic.

2020 **Software Engineering Intern**, WORKRISE, Data Engineering.

- Deployed Amundsen, an open source data discovery tool, using GCP and Workrise's data platform in Snowflake.
- Generated custom usage statistics using real user data in Snowflake with SQL, and ingested them into Amundsen for analysis.
- Worked alongside the Business Intelligence team to identify features and metadata to gather in Amundsen.

2019-2020 **Student Security Analyst**, TEXAS A&M UNIVERSITY, IT Security Operations.

- Developed a solution based on a security report to automatically identify false positives, saving a significant amount of time for Security Analysts.
- Monitored the TAMU network in real-time through various IDS systems, such as Splunk, and analyzed a variety of data sources to triage security events.
- Assisted to manage and train Junior Student Security Analysts.

Publications

[1] **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 '24. 2024.

[2] 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 '23. 2023.

Conferences

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. Models	CUDA, MPI, OpenMP
Tools	DATA: Matplotlib, NumPy, Pandas
	PERF: Caliper, Hatchet, Thicket
	ML: PyTorch, Scikit-Learn
	DEVOPS: Airflow, GCP, Docker, Snowflake, Terraform
HPC	Slurm, LSF
Miscellaneous	Bash, Git, LaTeX, Linux