Matthew James Davis

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EDUCATION:

Texas A&M College Station – Graduation: May 2022

- Major: Computer Science Minors: Statistics, Mathematics
- GPA = 3.876 / 4.000

SKILLS:

Languages

- Proficiency – Java
- Competency – C/C++, Fortran, R, Python

Tools/Frameworks

MPI, OpenMP, Google's Thread Sanitizer, LLVM

Experience:

May 2021 - August 2021: Argonne National Lab – Research Aide

I assisted the MPICH library team by creating automated concurrency bug detection for the library and creating a system which automatically generates values for unit testing of MPI functions.

Supervisor: Dr. Yanfei Guo

Research:

Concurrent Program Security Tools

2019: Designed a program which generates Google Thread Sanitizer optimization blacklists for a tool which predicts potential concurrent software vulnerabilities in multithreaded internet browser software based on the Google Chromium base (Google Chrome, Microsoft Edge, Opera).

2020 – 2021: Created a tool which finds Data Race concurrency bugs for programs written in C/C++ & Fortran using the OpenMP concurrency library. The program combines both static and dynamic analysis to achieve results better than existing tools.

2021 – Current: Extending the hybrid analysis tool described above to handle GPU CUDA program by using the CURD dynamic analysis tool and the OpenRace static analysis library.

Research Advisor: Dr. Jeff Huang of Texas A&M University

Honors & Awards:

- Eagle Scout
- Engineering Honors Distinction
- Dean's Honor Roll 2018, 2019, 2020

Publications:

Davis, Matthew James; Theriot, Dylan (2022). Dynamatic: An OpenMP Race Detection Tool Combining Static and Dynamic Analysis. Undergraduate Research Scholars Program. Available electronically from https://hdl.handle.net/1969.1/194411.