MADISON SHERIDAN

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SUMMARY

Ph.D. in Mathematics with interdisciplinary expertise in computational physics, numerical modeling, and automated system testing. Experienced in developing and validating large-scale simulation and control codes in **Python** and **C++**, with a focus on **test automation, data validation, and system integration**. Adept at debugging complex software/hardware interactions and analyzing telemetry-style outputs to verify performance. U.S. citizen with active **Secret clearance (eligible for TS/SCI)**. Seeking a position in **Satellite Integration and Test Engineering**.

EXPERIENCE

Graduate Teaching/Research Assistant Aug 2019 - Dec 2025
Texas A&M University *College Station, TX*
Advisor: Jean-Luc Guermond

- Designed and implemented large-scale **finite element simulation frameworks** in C++ and Python for multiphysics systems, integrating automated test procedures and verification scripts.
- Conducted **data-driven performance validation**, analyzing large telemetry-style datasets to ensure numerical stability and physical accuracy.
- Developed **automated regression tests** and benchmarks to validate robustness across multiple software releases.
- Presented validated system results at national conferences (SIAM CSE, USNCCM), emphasizing test verification, analysis, and interdisciplinary collaboration.
- Instructor of Record for MATH 140; developed, administered, and assessed technical course materials and exams.

Graduate Student Intern - Computational Physics May 2022 - Sep 2023
Lawrence Livermore National Laboratory *Livermore, CA*
Mentor: Vladimir Tomov

- Extended high-order Lagrangian simulation tools using **Python- and C++-based automation** within a controlled testing environment.
- Collaborated with engineers to **develop, execute, and troubleshoot automated test scripts** validating space-physics models.
- Performed **regression testing and data verification** ensuring consistency across code updates and hardware configurations.
- Worked in **Git/GitLab** environments with code reviews, version control, and CI pipelines for HPC test deployments.

Graduate Student Intern - Signal Processing & Automation May 2019 - Apr 2022
Nevada National Security Site *North Las Vegas, NV*
Mentors: Cleat Zeiler, Marylesa Howard, Daniel Champion

- Created **Python-based signal processing and testing pipelines** to reconstruct and validate seismic sensor data.
- Authored **automated data acquisition scripts** and test routines for field deployment integrating telemetry feeds into real-time monitoring.
- Enhanced test efficiency by designing algorithms for data integrity verification and anomaly detection.

EDUCATION

PhD, Mathematics, Texas A&M University, College Station, TX — Aug 2019 - Dec 2025
Thesis: A Robust Lagrangian Framework for Compressible Flow & Hyperelasticity
Emphasis: Finite Element Analysis, Systems Verification, Computation Fluid Dynamics, Partial Differential Equations

Bachelor of Science, Mathematics (Computer Science minor), — Jan 2015 - Apr 2019
Brigham Young University - Idaho, Rexburg, ID

SKILLS

- **Programming & Tools:** Python, C++, MATLAB, Git/GitLab, CMake, MPI/OpenMP, Linux/Unix, Docker, LaTeX
- **Test & Integration:** Automated Test Scripting, Data Verification, Regression Testing, Telemetry Analysis, CI/CD Pipelines, EGSE familiarity
- **Modeling & Simulation:** Finite Element Methods (FEM), CFD, PDE Solvers, HPC Performance Analysis
- **Software & Frameworks:** TensorFlow, MFEM, ParaView, GLVis, EASY (conceptual familiarity), Command/Telemetry Databases
- **Communication:** Technical Writing, Team Collaboration, Presentations, Teaching

OUTREACH & SERVICE

Undergraduate Research Advisor
Texas A&M University — *College Station, TX*

- Guided an undergraduate research project on nonlinear elasticity for the Modeling and Simulation with PDEs summer school, supporting problem formulation, implementation, and presentation of results. (2024)
- Supervised an undergraduate research project on chemotaxis for the Directed Reading Program, providing one-on-one instruction, feedback, and research direction, culminating in an end of the semester presentation. (2022)

Volunteer

- Mathematics and Statistics Fair, Texas A&M University — Jan 2023
- **GED Prep Instructor**, B/CS Community Education Center, Bryan, TX — 2021-2022
- **Proctor**, High School Math Contest, Texas A&M University — Oct 2019

Eagle Scout — Apr 2012

LEADERSHIP

Organizer — Jul 2023
Mini-symposium on "Invariant-Domain Preserving Hydrodynamics: From Euler to Navier-Stokes"
17th U.S. National Congress on Computational Mechanics, Albuquerque, NM, USA

Organizer — Nov 2022
Mini-symposium on "High Order Methods for Computational Hydrodynamics"
5th Annual Meeting of the SIAM Texas-Louisiana Section, Houston, TX, USA

President, Vice President, Treasurer — 2019 – 2024
Society for Industrial and Applied Mathematics (SIAM) Graduate Student Chapter, Texas A&M University

LANGUAGES

English — Native Language
Portuguese — Intermediate Listener, Intermediate Speaker, Advanced Reader, Novice Writer