

# Jeremy M. Myers *(he/him)*

 *Ph.D. Candidate, College of William & Mary*  
 *Graduate Intern, Sandia National Laboratories*

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## Education

- Ph.D., Computer Science (Dec. 2022 *expected*), College of William & Mary, Williamsburg, VA.
  - Dissertation Title: *Low-Rank Matrix and Tensor Models for Data Science Applications in Scientific Computing*
  - Co-advisors: Andreas Stathopoulos and Daniel M. Dunlavy
  - Concentration: Computational Science
- M.S., Mathematical Sciences (Aug. 2017), Virginia Commonwealth University, Richmond, VA.
  - Thesis Title: *Computational Fluid Dynamics in a Terminal Alveolated Bronchiole Duct with Expanding Walls: Proof-of-Concept in OpenFOAM*
  - Advisor: Rebecca Segal
  - Concentration: Applied Mathematics
- B.S., Mathematical Sciences (Dec. 2014), Virginia Commonwealth University, Richmond, VA.
  - Concentration: Applied Mathematics
- B.A., International Affairs (May 2009), James Madison University, Harrisonburg, VA.
  - Concentration: Comparative Politics – Russia
  - Minors: Economics, Russian Studies

## Professional Experience

- R&D Graduate Intern (2019–), Sandia National Laboratories, Livermore, CA.
  - Implemented fine-grained computational and statistical metrics in MATLAB and [SparTen](#) with results that were published in three peer-reviewed conferences (HPEC20, HPEC21, PP22) and two Sandia technical reports; implemented parallel algorithms for experimental analysis; extension and simplification of UI; parameter sensitivity analyses.
  - Worked with lead developer of [Genten](#) to implement parallel algorithms and UI extensions for research that was published in a Sandia technical report and presented at the PP22 conference.
  - Engineered data wrangling algorithms in Python to transform raw temporal data into multiway sparse tensor format.
  - Performed exploratory data science analysis with NumPy, Pandas, and JupyterLab.
  - Supervised graduate intern: Andrew Maicke (May–Aug. 2022).
- Graduate Research Assistant (2019–), Department of Computer Science, College of William & Mary, Williamsburg, VA.
  - Researched and developed matrix sketching and matrix sampling algorithms for streaming data applications (*paper in progress*); researched iterative solvers for eigenvalue and singular value decomposition; implemented algorithms and optimized code for kernel machine learning computations and analysis.
- Graduate Teaching Assistant (2017–19), Department of Computer Science, College of William & Mary, Williamsburg, VA.
- Graduate Teaching Assistant (2015–17), Department of Mathematics & Applied Mathematics, Virginia Commonwealth University, Richmond, VA.

## Software Development

- [SparTen: Canonical Polyadic Alternating Poisson Regression \(CP-APR\) in C++](#) (*Core development team member*)
- [Genten: Software for Generalized Tensor Decompositions in C++](#) (*Fork maintainer*)
- MATLAB experience: implemented algorithms for matrix sketching and sampling; extensive use of toolboxes (e.g. MEX, statistics and machine learning, optimization) and external packages (PRIMME, Tensor Toolbox).

- Parallel computing and other experience: parallel algorithms implementation in Kokkos; extensive cluster computing use (> 1M numerical experiments ran successfully) with schedulers (e.g. SLURM, LSF); familiarity with multiple build systems (e.g. CMake) on heterogeneous backends (Intel CPU, accelerators, ARM); extensive shell scripting (e.g. bash).

### Peer-Reviewed Publications

- [P3] Jeremy M. Myers, Daniel M. Dunlavy, [Using Computation Effectively for Scalable Poisson Tensor Factorization: Comparing Methods Beyond Computational Efficiency](#), in *Proceedings of the IEEE High Performance Extreme Computing Conference (HPEC21)*, September 2021.
- [P2] Keita Teranishi, Daniel M. Dunlavy, Jeremy M. Myers, Richard F. Barrett, [SparTen: Leveraging Kokkos for On-node Parallelism in a Second Order Method for Fitting Canonical Polyadic Tensor Models to Poisson Data](#), in *Proceedings of the IEEE High Performance Extreme Computing Conference (HPEC20)*, September 2020.
- [P1] Jeremy M. Myers, Daniel M. Dunlavy, Keita Teranishi, D. S. Hollman, [Parameter Sensitivity Analysis of the SparTen High Performance Sparse Tensor Decomposition Software](#), in *Proceedings of the IEEE High Performance Extreme Computing Conference (HPEC20)*, September 2020.

### Conference Presentations

- [C4] Jeremy M. Myers, Daniel M. Dunlavy, [Cyclic GCP-CPAPR Hybrid](#), 20th SIAM Conference on Parallel Processing for Scientific Computing 2022 (PP22), February 23–26, 2022.
- [C3] Keita Teranishi, D. S. Hollman, Jeremy M. Myers, Richard F. Barrett, and Daniel M. Dunlavy, [Load balancing strategy of Parallel Performance Portable Sparse CP-APR Decomposition](#), 19th SIAM Conference on Parallel Processing for Scientific Computing (PP20), February 2020.
- [C2] Andreas Stathopoulos, Jeremy M. Myers, Lingfei Wu, Eloy Romero, and Zhenming Liu, Using the power of iterative methods for the SVD in machine learning, Numerical Analysis and Scientific Computation with Applications, 2018.
- [C1] Andreas Stathopoulos, Jeremy M. Myers, Lingfei Wu, Eloy Romero, Fangli Xu, and Zhenming Liu, Does machine learning need the power of iterative methods for the SVD?, 15th Copper Mountain Conference on Iterative methods, 2018.

### Technical Reports

- [T3] Jeremy M. Myers and Daniel M. Dunlavy, [A Hybrid Method for Tensor Decompositions that Leverages Stochastic and Deterministic Optimization](#), Technical Report Number SAND2022-5616R, Sandia National Laboratories, Albuquerque, NM and Livermore, CA, July 2022.
- [T2] Jeremy M. Myers, Daniel M. Dunlavy, Keita Teranishi, D. S. Hollman, [Parameter Sensitivity Analysis of the SparTen High Performance Sparse Tensor Decomposition Software: Extended Analysis](#), Technical Report Number SAND2020-11901R, Sandia National Laboratories, Albuquerque, NM and Livermore, CA, October 2020.
- [T1] Jeremy M. Myers, Daniel M. Dunlavy, Keita Teranishi, and D. S. Hollman, Parameter Sensitivity Analysis of the SparTen High Performance Sparse Tensor Decomposition Software, in *Computer Science Research Institute Summer Proceedings 2020*, A.A. Rushdi and M.L. Parks, eds., Technical Report SAND2020-12580R, Sandia National Laboratories, 2020, pp. 99–110.

### Other Presentations

- [O2] Jeremy M. Myers, Tensor methods for data science, *Sandia Winter Intern Symposium*, Virtual, Feb. 2022.
- [O1] Jeremy M. Myers, What the heck is an eigenvalue?, *Graduate Student Association Journal Club*, Williamsburg, VA, April 2019.

### Professional Service

- *Workshop, Conference, and Minisymposium Organization*

- Minisymposium Co-organizer, [Parallel Algorithms for Tensor Computations and their Applications](#), SIAM Conference on Parallel Processing for Scientific Computing (PP22), Hybrid Conference, Feb. 23–26, 2022.
- Minisymposium Co-organizer, [Optimizations for Sparse Tensor Factorizations in High Performance Computing](#), SIAM Conference on Applied Linear Algebra (LA21), Virtual Conference, May 17–21, 2021.
- *Conferences and Workshops*
  - Genius Bar, [Tensor Decompositions: A Quick Tour of Illustrative Applications](#), SIAM Conference on Mathematics of Data Science (MDS22), San Diego, CA, September 26–30, 2022.
  - Student Volunteer, The International Conference for High Performance Computing, Networking, Storage, and Analysis (SC21), November 13–19, 2021.
- *Committee Work*
  - Student Representative, Graduate Student Advisory Group, College of William & Mary, 2020–2021.

### **Honors and Awards**

- SIAM Student Travel Award, SIAM Conference on Applied Linear Algebra, 2021.
- Graduate Student Association Conference Award, College of William & Mary, 2021.
- Graduate Student Association Conference Award, College of William & Mary, 2020.
- Math in Moscow Travel Grant, American Mathematical Society, 2014.
- Amalia D. Baylor Russian Language Scholarship, James Madison University, 2007.

### **Professional Association and Society Memberships**

- [Society for Industrial and Applied Mathematics \(SIAM\)](#)
- [Institute of Electrical and Electronics Engineers \(IEEE\)](#)

### **Certifications**

- Adult First Aid/CPR/AED (ID # 00VMSRJ), American Red Cross, Expires: July 2024.