

Chandler M. Smith

Curriculum vitae

Tufts University

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720-949-5334

Education

Ph.D., Mathematics, under A. Tasissa

Tufts University, expected graduation May 2026, Medford, MA.

M.A., Mathematics, under A. Tasissa

Tufts University, May 2023, Medford, MA

B.A., Chemistry (with Distinction) and Physics (with Distinction), Mathematics Minor, under M.G. Hill and A. J. Schramm

Occidental College, May 2019, Los Angeles, CA

Research Interests

My research is broadly in applied mathematics, with my current interests living in the intersection of matrix completion, non-convex optimization, high dimensional probability, and geometry. The applications of my work range from the Euclidean distance matrix completion (EDMC) problem to manifold learning and dimensionality reduction more broadly. Much of my work has been dedicated to providing provable convergence conditions to various non-convex algorithms that are more computationally efficient than more analytical convex programs for EDMC. A common thread throughout my research is a theoretical analysis of non-convex approximations and a principled design of algorithms for possibly large-scale problems.

Work Experience

Research Assistant, Mathematics Department, Tufts University

May 2023 to Present, Medford, MA

Instructor of Record, Mathematics Department, Tufts University

- Mathematical Aspects of Data Analysis, Fall 2025
- Statistics, Summer 2024

Teaching Assistant, Mathematics Department, Tufts University

- Calculus III, Fall 2021, Summer 2023
- Differential Equations, Spring 2022
- Probability, Summer 2022
- Real Analysis I, Fall 2022
- Linear Algebra, Spring 2023
- Numerical Analysis, Spring 2025

September 2021 to Current, Medford, MA

Research Assistant, Data Intensive Studies Center, Tufts University

- Anomaly detection in noisy real-world data using normalizing flows and other deep learning techniques using PyTorch and TensorFlow

February 2022 to August 2022, Medford, MA

Post-Baccalaureate Researcher, Los Alamos National Laboratory, NEN-1

- Data analysis for low-temperature superconducting microcalorimeters using off-the-shelf learning techniques in Python

June 2019 to May 2021, Los Alamos, NM

Undergraduate Researcher, Occidental College

- Electrochemical studies of organometallic compounds for use in photovoltaic cells

January 2017 to May 2019, Los Angeles, CA

Academic Mastery Program Facilitator, Occidental College

August 2017 to May 2019, Los Angeles, CA

Teaching Assistant, Chemistry Department, Occidental College

January 2017 to May 2019, Los Angeles, CA

Programming Experience

- Strong Experience in MATLAB and Python (5+ years)
- Experience with PyTorch and TensorFlow (2 years)
- Experience with R and SQL (1 year)

Selected Presentations

1. *Incoherence, Geometry, and Frame Theory.* **C.M. Smith.** *Analysis Seminar, Tufts University* (2025)
2. *A Provably Convergent Fast Algorithm for Euclidean Distance Geometry.* **C.M. Smith,** H. Cai, A. Tasissa. *Bogotá Optimization Workshop* (2024)
3. *A Riemannian Approach to Euclidean Distance Geometry through Adaptive Sampling* **C.M. Smith,** H. Cai, A. Tasissa. *SIAM Mathematics of Data Science* (2024)
4. *A Provably Convergent Fast Algorithm for Euclidean Distance Geometry.* **C.M. Smith,** H. Cai, A. Tasissa. *NSF CompMath* (2024)
5. *Riemannian Optimization for Euclidean Distance Geometry.* **C.M. Smith,** S. Lichtenberg, H. Cai, A. Tasissa. *OPT2023: 15th Annual Workshop on Optimization for Machine Learning at NeurIPS*, (2023)

Selected Publications

1. *Provable Convergence of Non-Uniform Sampling Models for Arbitrarily Poor Geometries in the Euclidean Distance Geometry Problem.* **C.M. Smith,** A. Tasissa. *In preparation.*
2. *Provable Non-Convex Euclidean Distance Matrix Completion: Geometry, Reconstruction, and*

Robustness **C.M. Smith**, H. Cai, A. Tasissa. *Submitted to IEEE Transactions on Information Theory, arXiv:2508.00091 (2025)*

3. *Riemannian Optimization for Non-Convex Euclidean Distance Geometry with Global Recovery Guarantees.* **C.M. Smith**, H. Cai, A. Tasissa. *arXiv:2410.06376 (2024)*
4. *Riemannian Optimization for Euclidean Distance Geometry.* **C.M. Smith**, S. Lichtenberg, H. Cai, A. Tasissa. *OPT2023: 15th Annual Workshop on Optimization for Machine Learning at NeurIPS, (2023)*

Conference Participation

- Presenter at *NSF AIVO Summit for AI Leadership Institute*, October 2025
- Presenter at *Bogotá Optimization Workshop*, December 2024
- Presenter at *SIAM Mathematics of Data Science*, October 2024
- Presenter at *NSF CompMath Workshop*, July 2024
- Participant at *ICERM Workshop “Interacting Particle Systems”*, May 2024
- Presenter at *OPT-ML Workshop 2023* at NeurIPS, December 2023
- Participant at *SLMath Summer School “Concentration Inequalities and Localization Techniques for High Dimensional Probability and Geometry”*, July 2023
- Participant at *JMM 2023*, January 2023

Reviewer Responsibilities

- Reviewer for *BIT Numerical Mathematics*, Fall 2025
- Reviewer for *OPT-ML Workshop 2024* at NeurIPS, Fall 2024

Leadership Roles

Tufts SIAM President

May 2024 to May 2025, Medford, MA

Tufts Organization of Graduate Students in Mathematics Vice President

May 2024 to May 2025, Medford, MA

Tufts SIAM Chapter Vice President

September 2023 to May 2024, Medford, MA

Tufts Organization of Graduate Students in Mathematics Secretary

September 2023 to May 2024, Medford, MA

Tufts SIAM Chapter Treasurer

May 2022 to August 2023, Medford, MA

Tufts SIAM Chapter Secretary

May 2022 to August 2023, Medford, MA

All Publications

1. *Provable Convergence of Non-Uniform Sampling Models for Arbitrarily Poor Geometries in the Euclidean Distance Geometry Problem.* **C.M. Smith**, A. Tasissa. *In preparation.*

2. *Provable Non-Convex Euclidean Distance Matrix Completion: Geometry, Reconstruction, and Robustness* **C.M. Smith**, H. Cai, A. Tasissa. *Submitted to IEEE Transactions on Information Theory, arXiv:2508.00091 (2025)*
3. *Riemannian Optimization for Non-Convex Euclidean Distance Geometry with Global Recovery Guarantees*. **C.M. Smith**, H. Cai, A. Tasissa. *arXiv:2410.06376 (2024)*
4. *Riemannian Optimization for Euclidean Distance Geometry*. **C.M. Smith**, S. Lichtenberg, H. Cai, A. Tasissa. *OPT2023: 15th Annual Workshop on Optimization for Machine Learning at NeurIPS, (2023)*
5. *Provable Convergence of Non-Uniform Sampling Models for Arbitrarily Poor Geometries in the Euclidean Distance Geometry Problem*. **C.M. Smith**, A. Tasissa. *In preparation.*
6. *Measurement of ^{227}Ac Impurity in ^{225}Ac using Decay Energy Spectroscopy*. A.D. Tollefson, **C.M. Smith**, M.H. Carpenter, M.P. Croce, M. Fassbender, K.D. John, K.E. Koehler, L.M. Lilley, D.R. Schmidt, B.W. Stein, J.N. Ullom, M.D. Yoho, D.J. Mercer. *Applied Radiation and Isotopes*, (2021)
7. *Hyperspectral x-ray imaging: Progress towards chemical analysis in the SEM*. M.H. Carpenter et al., **C.M. Smith**, others.
8. *Experimental Validation of Calorimetric Electron Capture Spectral Theory with ^{193}Pt* . K.E. Koehler, M.W. Rabin, M.H. Carpenter, M.A. Famiano, C.J. Fontes, D.R. Schmidt, **C.M. Smith**, A.D. Tollefson, J.N. Ullom, M.D. Yoho, M.P. Croce. *Journal of Low Temperature Physics*. (2020)
9. *Improved Plutonium and Americium Photon Branching Ratios from Microcalorimeter Gamma Spectroscopy*. M.D. Yoho, K.E. Koehler, D.T. Becker, D.A. Bennett, M.H. Carpenter, M.P. Croce, J. Gard, J.A.B. Mates, D.J. Mercer, N.J. Ortiz, D.R. Schmidt, **C.M. Smith**, D.S. Swetz, A.D. Tollefson, J.N. Ullom, L.R. Vale, A.L. Wessels, D.T. Vo. *Nuclear Instruments and Methods in Physics Research Section A*. (2020)

All Presentations

1. *A Provably Convergent Fast Algorithm for Euclidean Distance Geometry*. **C.M. Smith**, H. Cai, A. Tasissa. *Bogotá Optimization Workshop (2024)*
2. *An Introduction to Optimization on Smooth Manifolds*. **C.M. Smith**. *Graduate Seminar in Mathematics, Tufts University (2024)*
3. *A Riemannian Approach to Euclidean Distance Geometry through Adaptive Sampling* **C.M. Smith**, H. Cai, A. Tasissa. *SIAM Data Science Workshop (2024)*
4. *A Provably Convergent Fast Algorithm for Euclidean Distance Geometry*. **C.M. Smith**, H. Cai, A. Tasissa. *NSF CompMath (2024)*
5. *Riemannian Optimization for Euclidean Distance Geometry*. **C.M. Smith**, S. Lichtenberg, H. Cai, A. Tasissa. *OPT2023: 15th Annual Workshop on Optimization for Machine Learning at NeurIPS, (2023)*
6. *Convex Relaxation, Compressive Sensing, and Matrix Completion*. **C.M. Smith**. *Graduate Seminar in Mathematics, Tufts University (2023)*
7. *An Infinite-Dimensional Spectral Theorem*. **C.M. Smith**. *Graduate Seminar in Mathematics, Tufts University (2022)*