Benjamin Cobb

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Education

2019 – present	🔖	**Georgia Institute of Technology** PhD student in Computer Science. GPA: 3.9
2015 – 2019	🔖	**Wake Forest University** Bachelor of Science with Honors in Computer Science Bachelor of Science in Mathematical Business Minor in Chinese Graduated Magnum Cum Laude

Research Publications (Accepted)

1. B. Cobb, R. Velasquez, R. Vuduc, and H. Park, "Clustering and Topic Discovery of Multiway Data via Joint-NCMTF," IEEE Big Data, 2024. 🔗 DOI: 10.1109/BigData62323.2024.10825741.

2. S. Eswar, K. Hayashi, B. Cobb, *et al.*, "On Rank Selection for Nonnegative Matrix Factorization," IEEE Big Data, 2024. 🔗 DOI: 10.1109/BigData62323.2024.10825324.

3. S. Eswar, B. Cobb, K. Hayashi, *et al.*, "Distributed-Memory Parallel JointNMF," in *Proceedings of the 37th International Conference on Supercomputing*, ser. ICS '23, Orlando, FL, USA: Association for Computing Machinery, 2023, pp. 301–312, ISBN: 9798400700569. 🔗 DOI: 10.1145/3577193.3593733.

4. B. Cobb, H. Kolla, E. Phipps, and Ü. V. Çatalyürek, "FIST-HOSVD: Fused In-place Sequentially Truncated Higher Order Singular Value Decomposition," in *Proceedings of the Platform for Advanced Scientific Computing Conference*, ser. PASC '22, Basel, Switzerland: Association for Computing Machinery, 2022, ISBN: 9781450394109. 🔗 DOI: 10.1145/3539781.3539798.

Research Publications (Under Review)

1. B. Cobb, R. Kannan, K. Pieper, *et al.*, *Fast Active-Set Thresholding Method for Nonnegative Least Squares*, 2025.

2. B. Cobb, R. Kannan, Y. Soh, *et al.*, *LORACX: Low Rank Approximations with Constraints at Exascale*, 2025.

Employment History

2019 – present	🔖	**Graduate Research Assistant** *Georgia Institute of Technology, Atlanta, GA*
Summer 2024 Spring 2025	🔖	**Discrete Algorithms Intern** *Oak Ridge National Laboratory, Oak Ridge, TN*
Fall 2020,22,23,24	🔖	**Graduate Teaching Assistant** *Georgia Institute of Technology, Atlanta, GA*
Summer 2020	🔖	**Computer Science Research Institute Intern** *Sandia National Laboratories, Albuquerque, NM (Virtual due to COVID-19)*

Employment History (continued)

Summer 2018 | **Undergraduate Research and Creative Activities Center (URECA) Researcher**
Wake Forest University, Winston-Salem, NC

2016 – 2019 | **Resident Advisor**,
Wake Forest University, Winston-Salem, NC

Projects (Contributed)

PLANC: Parallel Low-rank Approximations with Non-negativity Constraints

- Distributed MPI software package for large-scale matrix and tensor factorizations used in data analysis and compression.

GenTen Portable Tensor Decompositions

- Performance portable software package for tensor factorizations used in data compression.

MATLAB Tensor Toolbox

- Implemented minimum cost bipartite matching algorithm for least-squares cosine differences.

Fellowships

2019 - 2023 | **Presidential Fellowship (PF)**
Georgia Institute of Technology, Atlanta, GA

Summer 2018 | **Wake Forest Research Fellowship (WFRF)**
Wake Forest University, Winston-Salem, NC

Scholarships

June 2018 – May 2019 | **H. Howell Taylor, Jr. Risk Management Scholarship**
Wake Forest University, Winston-Salem, NC

Skills

Main Programming Languages | C/C++, MatLab, Python

High Performance Computing | MPI, CUDA, Kokkos, OpenMP, cache aware programming

Software Development | Git, CMake, Unit Tests, Vim, Slurm, Tmux, Linux Command Line, Scripting

Performance Analysis and Debugging | Roofline Bandwidth Analysis, VTune, GNU Debugger (GDB)

Machine Learning | Deep Learning, Neural Nets, PyTorch, Matrix and Tensor Factorizations, Calculus, Linear Algebra

Expertise | Unsupervised Machine Learning, Tensor Kernels, Tensor Analysis, Tensor Decompositions, Nonnegativity Constrained Low Rank Approximations