

Swethasree Bhattaram

PhD Student - School of CSE @ Georgia Tech

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RESEARCH INTERESTS

PhD student specializing in High-Performance Computing (HPC) and Parallel Algorithm Design. Expertise in optimizing large-scale distributed systems, developing GPU-accelerated ML frameworks, and scaling complex algorithms for multi-modal data integration and analysis. Strong foundation in Python, C++, and MPI.

EDUCATION

- Georgia Institute of Technology** Atlanta, GA
 - Doctor of Philosophy (PhD), School of CSE. Advised by Prof. Srinivas Aluru.* 2023 – 2027 (expected)
 - Master of Science (MS) in Bioinformatics. Advised by Prof. Rishikesan Kamaleswaran.* 2021 – 2022
- University of Illinois at Urbana-Champaign** Champaign, IL
 - Bachelor of Science (BS) in Bioengineering, Minor in Computer Science.* 2017 – 2021

WORK EXPERIENCE

- Georgia Institute of Technology** Atlanta, GA
 - Graduate Researcher* August 2021 – Present
 - (PhD) Developed a scalable implementation of Gromov-Wasserstein optimal transport that utilizes matrix-safe joint embeddings to ensure numerical stability during large-scale integration of single cell datasets.
 - (PhD) Parallelizing the Gromov Wasserstein algorithm for large scale single-cell data of multiple modalities.
 - (MS) Collaborated on early-stage PDAC detection by correlating sequencing data with radiological and histopathological image patterns using CNNs.
 - (MS) Designed and implemented an NLP pipeline to identify acute respiratory distress syndrome and sepsis severity from doctors' notes.
- Oak Ridge National Laboratory** Knoxville, TN
 - Graduate Research Intern (GRO)* May 2026 – Present
 - Working on NMI algorithms for single cell multimodal integration (Fall 2026 GRO)
 - Developed CAHS: a knowledge-guided framework that augments hidden markov model based protein homology search and alignment with query-specific adaptation to local sequence context.
 - Explored end-to-end GPU implementations of the HMMER suite (HMMBuild, HMMAlign, HMMSearch).
- Exact Sciences** San Diego, CA
 - Research Intern* May 2025 - Feb 2026
 - Developed end-to-end ML pipelines for short-variant assay data; optimized classifier performance and conducted sensitivity analysis on protein degradation effects.
- University of Maryland School of Medicine** Baltimore, MD
 - Bioinformatics Research Intern* May 2022 - August 2022
 - Implemented graph models of liver and kidney cellular data (gene network, and omics data analysis) to identify patterns representing organ rejection post transplant.

PUBLICATIONS

- Bhattaram, S., Bhowmik, D., Kannan, R.**
CAHS: Context Aware Homology Search
ACM KDD 2026, AI for Sciences Track
- Bhattaram, S., Chockalingam, S., Aluru, M., Aluru, S.**
scSAGA: Single-cell Sampled Gromov Wasserstein Alignment for Scalable and Memory-efficient Integration of Multi-modal Single Cell Data
Under Review: Bioinformatics, Oxford Academic

RELEVANT GRADUATE COURSEWORK

High Performance Computing, Artificial Intelligence, Multivariate Statistic Analysis, Machine Learning Biosciences, Computational Genomics

RELEVANT SKILLS

Python, C++, R, MPI, OpenMP, PyTorch, spaCy, NLTK, Statistics/Probability Distributions

REFERENCES

Prof. Srinivas Aluru (Georgia Tech; aluru@cc.gatech.edu)

Dr. Ramakrishnan Kannan (Oak Ridge National Lab; kannanr@ornl.gov)