Mirabel Reid

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EDUCATION

Georgia Institute of Technology, *Atlanta, GA, USA* Sep 2020-Present
Pursuing PhD in Computer Science
University of Pittsburgh, *Pittsburgh, PA*, *USA*
Bachelor of Science Sep 2016-April 2020
Double Major in Computer Science, Mathematics

RESEARCH INTERESTS

- Mathematically tractable models for neural computation.
- Cognitive abilities of Large Language Models (LLMs).
- Interplay between machine and human learning and computation.

WORK EXPERIENCE

Meta *Sunnyvale, CA, USA*
Software Engineering Intern May 2025-Aug 2025
- Explored statistical and neural network algorithms for synthetic tabular data generation.

Designed a pipeline to efficiently train and generate datasets from high-frequency temporal snapshots.

Max Planck Institute for Intelligent Systems *Tübingen, DE*
Research Intern May 2023-Aug 2023
- Modelled online human/AI expert systems under budget constraints.
- Implemented a simulation in **Python** on real and synthetic Human and AI performance data.

Los Alamos National Laboratory *Los Alamos, NM, USA*
Research Intern May 2022-Oct 2022
- Researched improvements for Machine Learning workflows for scientific applications.
- Built a metadata visualization and selection tools in **Python and SQL** in collaboration with domain scientists.

Software Engineering Institute *Pittsburgh, PA, USA*
Intern: Emerging Technology Center, Software Solutions Division Jan 2020-Aug 2020
- Investigated novel applications of Graph Neural Networks for software development.
- Implemented machine learning prototypes in **PyTorch** and **ROS.**

HONORS/AWARDS

Georgia Tech ARC-ACO Fellowship Nov 2023
ARC Triad Research Fellowship Nov 2021
Georgia Tech Presidential Fellowship Apr 2020
Culver Award (Achievement in Mathematics) Apr 2020
Brackenridge Research Fellowship May 2018

PUBLICATIONS

Reid, M., & Zhang, D. (2025). The alpha-Cap Process: A Continuous Model for Random Geometric Networks of Binary Neurons. *arXiv preprint arXiv: 2508.09396.*

Reid, M., & Vempala, S. S. (2024). Does GPT Really Get It? A Hierarchical Scale to Quantify Human vs AI's Understanding of Algorithms. Proceedings of AAAI 2025, Oral Presentation. *arXiv preprint arXiv:2406.14722*.

Reid, M., Sühr, T., Vernade, C., and Samadi, S. (2024) "Online Decision Deferral under Budget Constraints", *arXiv preprint arXiv:2409.20489*

Reid, M. & Vempala, S. S. (2023). The k -Cap Process on Geometric Random Graphs. In *The Thirty Sixth Annual Conference on Learning Theory* (pp. 3469-3509). PMLR.

Reid, M., Sweeney, C., and Korobkin, O. (2024) "Improving Radiography Machine Learning Workflows via Metadata Management for Training Data Selection", *arXiv preprint arXiv:2408.12655*

PRESENTATIONS

On k-Winners-Take-All as a Model of Neuron Communication — CMU Theory Lunch Seminar, 2025.

Does GPT Really Get It? A Hierarchical Scale to Quantify Human vs AI's Understanding of Algorithms— Poster at NeurIPS 2024 (Behavioral ML Workshop); Lightning Talk at Simons Institute Workshop on Higher-Level Intelligence, 2024.

Assemblies and the k-Cap Process: The Effects of Locality on Neural Firing Dynamics — Computational and Systems Neuroscience (COSYNE) 2023

Convergence of the k-cap Process on Graphs with Weight Reciprocity — INFORMS Applied Probability Society Meeting 2023.

The k-Cap Process on Geometric Random Graphs — Mathematical and Scientific Foundations of Deep Learning Annual Meeting 2022

TEACHING

- *Fall 2023* Teaching Assistant for Advanced Algorithms
- *Fall 2021* Teaching Assistant for the Introduction to Graduate Algorithms
- *Spring 2019* Teaching Assistant for Discrete Mathematics