

SARAH HELMBRECHT

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Education

M.S. in Mathematics – New York University, Courant Institute

New York City, NY | Sep 2023 – May 2025

B.S. in Mathematics & Computer Science – Tulane University

New Orleans, LA | August 2020 – May 2023

Work Experience

Applied Machine Learning Engineer – Freelance

January 2025 – present

- Design and solve novel machine learning and scientific computing problems targeting limitations in modern ML systems, with a focus on reasoning, optimization, and numerical methods.
- Analyze model failure modes across development cycles to identify weaknesses and refine task design.
- Develop structured solution traces and supervision strategies to improve model performance.
- Coordinate distributed contributor teams ranging from small groups to 100+ participants.

Teaching Assistant – New York University

September 2023 – May 2024

- Led 4 Calculus I sections (133 students) and 2 Linear Algebra sections (65 students); designed and graded assessments; held weekly recitations and office hours.

Quantitative Finance Intern – Franklin Templeton, O’Shaughnessy Asset Management

May 2023 – August 2023

- Researched and implemented a probabilistic PCA risk model.

Projects and Research

Master’s Thesis – New York University

January 2025 – May 2025

- Analyzed theoretical frameworks for generalization in deep learning, including sharpness-oriented metrics, implicit regularization, and PAC-Bayes bounds.

Big Data Final Project – New York University

September 2024 – May 2025

- Built a recommendation system using distributed data processing and cloud-based infrastructure across AWS and GCP.

Skills

- **Programming:** Python, C/C++, MATLAB, SQL
- **Machine Learning:** Neural networks, optimization algorithms, numerical linear algebra, model evaluation and failure analysis
- **Systems & Infrastructure:** Distributed GPU systems, job scheduling, and large-scale training workflows
- **Tools & Platforms:** Docker, Git, CI/CD; AWS, GCP