**Zara Hall**

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EDUCATION

**Columbia University**  **New York, NY**

M.S. Computer Science Expected May 2025

B.S. Computer Science, Theory Track; **GPA 3.71/4.0** May 2024

* **Relevant Coursework:**  Natural Language Processing, Spoken Language Processing, Computational Complexity, Modern Analysis I/II, Modern Algebra, Probability Theory, Analysis of Algorithms

WORK EXPERIENCE

**MindCo San Jose, CA**

Founding Machine Learning Research Engineer Summer 2024

First Machine Learning Engineer at MindCo, a pre-seed startup backed by Soma Capital building EEG models

* Developed a state-of-the-art EEG-to-text model, implemented multi-head self-attention transformers for capturing long-range dependencies in EEG signals and a bidirectional LSTM decoder with attention.
* Built a serverless data preprocessing pipeline using AWS Lambda to clean, filter, and extract features from raw EEG signals in real-time; implemented CNN-based feature extractor.

**Bridgewater Associates Westport, CT**

Investment Engineering Intern June 2023 – August 2023

Summer intern at Bridgewater Associates, the largest L/S global macro hedge fund with $150bn AUM

* Led a comprehensive analysis of equities data across Bridgewater, identifying key quality issues and gaps
* Designed machine learning algorithms in that prepare data infrastructure for advanced signal analysis

**Columbia Law School New York, NY**

Machine Learning Research Assistant December 2023 – Present

Research in algorithmic fairness, advised by Emily Black and Talia Gillis. Worked on a few projects, notably:

* Conducted a study on the impact of orthogonalizing inputs in ML for algorithmic fairness, determined limitations of blinding algorithms to protected characteristics, published in ACM CS&Law 2024
* Analyzed the efficacy of machine learning models in the context of legal frameworks for discrimination, completed paper published in ACM FAccT 2024

**Mandli Lab, Department of Applied Math, Columbia University New York, NY**

Bonomi Undergraduate Research Scholar May 2021 – August 2021

* Modeled storm surges that caused severe flooding using GeoClaw, a computational Python package; applied adaptive mesh refinement to generate geophysical flow visualizations and predict future damage.

**PricewaterhouseCoopers New York, NY**

Management Consulting InternJune 2022 – August 2022

* Collaborated with a team of consultants on a strategic project for a client in the technology sector; utilized Alteryx and Tableau to conduct market research, analyze financial data, and identified opportunities for growth and cost optimization.

**Columbia University New York, NY**

Teaching Assistant September 2022 – Present

* Teaching assistant for Introduction to Java, Linear Algebra, Calculus III, and Calculus II

**Jorabchi Lab, Department of Chemistry, Georgetown University**  **Washington, DC**

Research Assistant May 2018 – June 2020

* Developed processing algorithms in R to automatically analyze data and to create graphs using ion-mobility mass spectrometry data. Paper published in the Journal of the American Society for Mass Spectrometry.

SELECTED PAPERS

* McMahon WP., Dalvi R., Lesniewski JE., **Hall ZY.,** Jorabchi K. "Pulsed nano-ESI: Application in Ion Mobility- MS and Insights into Spray Dynamics." JASMS 2020.
* Gillis T., Black E., **Hall ZY.,** "D-Hacking." Accepted to the 2024 ACM FAccT Conference

SKILLS

**Programming Languages:** Java, C, C++, Python, SQL, R

**Tools:** PyTorch, HuggingFace, TensorFlow, Keras, Android Studio, LaTeX, AWS, Docker