Haoran Zhao

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EDUCATION

University of Melbourne | Melbourne, Australia Sep 2025 - Present
- PhD in Computer Science. Advisor: Dr. Soyeon Caren Han.

Northwestern University | Evanston, Illinois Sep 2023 - Dec 2024
- Master of Science in Computer Science. GPA: 3.967/4.0.

Drexel University | Philadelphia, Pennsylvania Sep 2021 - Jun 2023
- Bachelor of Science in Data Science. GPA: 4.0/4.0.

Lanzhou University | Lanzhou, China Sep 2019 - Jun 2021
- Bachelor of Engineering in Computer Science. GPA: 89.89/100.

RESEARCH INTERESTS

Multimodal learning, large language models, trustworthy AI, parameter-efficient fine-tuning, and the geometry of model representations.

RESEARCH EXPERIENCE

Geometry-Guided Adaptation for Multimodal Large Language Models | University of Melbourne Sep 2025 - Present
- Study how representation geometry shapes multimodal model behavior, adaptation, and alignment.
- Develop geometry-aware parameter-efficient fine-tuning methods for stable low-rank adaptation.
- Investigate modality gaps, rank constraints, and trustworthy adaptation in multimodal large language models.

LawLLM: Law Large Language Model for the US Legal System | Northwestern University Jan 2024 - Jun 2024
- Contributed to a multi-task legal-domain language model for Similar Case Retrieval, Precedent Case Recommendation, and Legal Judgment Prediction.
- Worked on task formulation, data preprocessing, and evaluation for specialized legal analytics.
- The work was accepted to the applied research track of CIKM 2024.

Drexel University Metadata Research Center | Research Assistant Jan 2022 - Jun 2023
- Built research pipelines for collecting and processing scholarly literature in materials science.
- Designed and implemented a named-entity recognition model for materials science literature.
- Maintained components of the HIVE4MAT system, including database and front-end technical issues.

Google Open Source Blockly Teaching Cases Systems | Lanzhou University Mar 2021 - Jan 2022
- Identified and designed core curriculum data systems for interactive teaching cases.
- Applied mathematical modeling to simulations including epidemic transmission, visual sorting algorithms, and strategic games.

PUBLICATIONS

- Zhao, H., Han, S. C., & Hovy, E. (2026). **When Is Rank-1 Enough? Geometry-Guided Initialization for Parameter-Efficient Fine-Tuning.** ICML 2026. https://openreview.net/pdf?id=Umu6IsAUbS
- Shu, D., Zhao, H., Liu, X., Demeter, D., Du, M., & Zhang, Y. (2024). **LawLLM: Law Large Language Model for the US Legal System.** CIKM 2024. https://arxiv.org/abs/2407.21065
- Greenberg, J., McClellan, S., Zhao, X., Kellner, E. J., Venator, D., Zhao, H., Shen, J., Hu, X., & An, Y. (2022). **Materials Science Ontology Design with an Analytico-Synthetic Facet Analysis Framework.** MTSR 2022. http://arxiv.org/abs/2211.10407
- Zhao, H., Li, Z., & Xu, S. (2021). **Computer dynamic model and time series prediction of air by LSTM recurrent neural network.** ICECCE 2021. https://doi.org/10.1088/1742-6596/2033/1/012085

INDUSTRY EXPERIENCE

Vivid Seats Inc. | Data Engineering Co-Op Sep 2022 - Mar 2023
- Participated in the design, development, and enhancement of the company's data platform.
- Built and optimized data migration pipelines, warehouse queries, and transaction queries.
- Processed data requests from multiple business departments and supported data engineering improvements.

AWARDS AND HONORS

- Dean's List, Drexel University, 2021 - 2023
- A. J. Drexel Scholarship, Drexel University, 2021 - 2022
- Scholarship for Outstanding Students, Lanzhou University, 2019 - 2021