Haoran Zhao

(445) 208 8781 | 1720 Central Street, Evanston, IL 60201, USA

HaoranZhao2024@u.northwestern.edu| haoranzhao.com

EDUCATION

Northwestern University | Evanston, Illinois   September 2023 - Present
Master of Science in Computer Science
GPA: 3.967/4.0
Expected graduation: June 2025

Drexel University | Philadelphia, Pennsylvania   September 2021 - June 2023
Bachelor of Science in Data Science
GPA: 4.0/4.0

Lanzhou University | Lanzhou, China   September 2019 - June 2021
Bachelor of Engineering in Computer Science
GPA: 89.89/100

RESEARCH INTERESTS

My research interests encompass a broad spectrum, including deep learning, artificial intelligence for science (AI4Science), and natural language processing (NLP). Presently, my focus primarily lies in the capabilities and potential applications of language models (LMs) within specific fields. Meanwhile, I also have a great interest in data mining and data science, especially in the interdisciplinary fields.

RESEARCH EXPERIENCE

RuleGPT: Online behavior analysis for autonomous vehicles based on Large Language Models   Jun 2024 – Present
- We propose a unified framework for monitoring and evaluating driving safety compliance by comprehensively considering the coupling relationships between people, vehicles, and roads.
- The method is applicable to accurately identifying expected driving functional safety and supporting driving decisions.

LawLLM: Law Large Language Model for the US Legal System | *Advised by Prof. Yongfeng Zhang*   Jan 2024 – Jun 2024
- The paper addresses the complexities of legal language and the challenges in distinguishing between similar and precedent cases for accurate legal analysis.
- It introduces LawLLM, a multi-task model designed for the US legal domain, excelling in Similar Case Retrieval, Precedent Case Recommendation, and Legal Judgment Prediction.
- The model outperforms existing baselines through customized data preprocessing and advanced techniques, significantly advancing legal analytics and guiding future research.

Drexel University Metadata Research Center | *Research Assistant, Advised by Prof. Jane Greenberg*   Jan 2022 – June 2023
- Spearheaded the development of the research pipeline, including identification and collection of pertinent literature in material science field and data processing.
- Designed and implemented a well-performed named-entity recognition model on material science literature.
- Oversaw the maintenance of the HIVE4MAT system, addressing database and front-end issues, among other technical challenges.

Google Open Source Blockly Teaching Cases Systems | *Advised by Prof. Changyan Di*   Mar 2021 – Jan 2022
- Identified and established the core curriculum data systems for the project, which included simulations of epidemic transmission, the butterfly effect, visual sorting algorithms in computing, and strategic game simulations.
- Applied mathematical modeling principles to design the case databases.

PUBLICATIONS

- 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. arXiv. 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

INSTERNSHIP 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.
- Participated in developing innovative solutions that gave Vivid Seats Inc. a competitive advantage and technology improvements on the data engineering team.
- Participated in tackling challenges such as building out new data migration pipelines and optimizing warehouse and transaction queries.

Hangzhou Yunge Data Technology Co., Ltd | *Student intern*   Aug 2019 – Sep 2019
- Assisted the project team members to carry out development and maintenance related works for the Qilu Traffic Big Data Management Platform.
- Participated in project code testing and data maintenance related works.
- Participated in the development of an accident emergency rescue module and used the Dijkstra algorithm to find the nearest emergency car repair points on the highways.

PROJECT EXPERIENCE

CALEX: A Rule-based Temporal Annotation System | *Team Leader*   April 2022
- A system that uses a rule-based approach to identify and normalize temporal expressions in English text using CALEX annotation schema.

Material Literatures NER Based on BiLSTM-CNN-CRF | *Team Leader*   April 2022
- Took charge of building the BILSTM-CNN-CRF model which was used for naming the entity recognition in materials science literature and making comparisons with the Bert-Base model.

Traffic Prediction for New York City Based on Graph Neural Network | *Team Leader*   April 2022
- Completed the Data Science Project course assignment on traffic prediction in New York City by using graphic neural network and Uber movement data.

Air Quality Prediction of Lanzhou Based on LSTM | *Team Leader*   Mar 2021 – June 2021
- Took charge of organizing group discussions, determining the research topics, and assigning tasks to the team members in the early stage.
- Took charge of proposing and organizing the works related to the implementation of the project and controlling the project schedule in the middle stage.
- Adopted the CV method for repeated samplings and compared the prediction model with the traditional RNN model.
- Recorded the experimental data and completed the experimental report.

AWARDS AND HONORS

Dean's List awarded by Drexel University	2021 – 2023
A. J. Drexel Scholarship awarded by Drexel University	2021 – 2022
Scholarship for Outstanding Students awarded by Lanzhou University	2019 – 2021