

Sorour Fatemi

Education

- 2019–present **Ph.D. Candidate in Management Information Systems**, *University of Illinois Chicago*, Chicago, USA.
Thesis Title: Emergent Capabilities of LLMs in Finance
- 2013–2016 : **M.Sc., Industrial Engineering**, *University of Tehran*, Tehran, Iran.
- 2008–2012 : **B.Sc., Computer Engineering**, *Isfahan University of Technology*, Isfahan, Iran.

Publications

- 2024 Sorouralsadat Fatemi and Yuheng Hu. A comparative analysis of fine-tuned llms and few-shot learning of llms for financial sentiment analysis. revised and submitted to ACM Transactions on Management Information Systems, Special Issue of Large Language Models, 2024.
- 2023 Ecem Basak, Ramah Al Balawi, Sorouralsadat Fatemi, and Ali Tafti. When crisis hits: Bike-sharing platforms amid the covid-19 pandemic. *PLoS one*, volume 18, page e0283603. Public Library of Science San Francisco, CA USA, 2023.

Papers Under Review

- 2024 Sorouralsadat Fatemi and Yuheng Hu. Finvision: A multi-agent framework for stock market movement and trading prediction, 2024.
- 2024 Sorouralsadat Fatemi and Yuheng Hu. Enhancing financial question answering with a multi-agent reflection framework, 2024.

Research Experience

Department of Information and Decision Sciences - University of Illinois at Chicago

2021 – present **Financial Sentiment Analysis and Stock Market Prediction.**

Fine-tuned the IDEFICS 2 multi-modal LLM to handle complex, Olympiad-level question-answering tasks, utilizing diverse datasets that included text and images.

Conducted experiments to enhance LLMs' reasoning capabilities for hybrid (textual + tabular) financial QA using a multi-agent framework with a reflection agent, achieving a 15% performance improvement for the LLaMA3-8b model and a 5% improvement for the 3-70b model over single-agent reasoning

Instruct fine-tuned LLaMA3-8b, Mistral-7b, and Phi-3 models using the QLoRA method for various financial text classification tasks, achieving a significant 10% improvement in accuracy

Conducted experiments on zero-shot and few-shot learning capabilities of LLMs (Flan-T5, Mistral, Llama-3, and Phi-3); enhanced performance by a minimum of 2% through the incorporation of a one-shot example in prompts.

Advisor : **Dr. Yuheng Hu**, Associate Professor, Department of Information and Decision Sciences, University of Illinois Chicago ([Personal Web-page](#))

2020 – 2021 **Analyzing the Effect of the COVID-19 Pandemic on Bike-sharing Platforms.**

Analyzed impact of Covid-19 pandemic on bike-sharing platforms using Fixed-Effects Regression; Identified a 22% increase in daily bike-sharing trips after the first Covid-19 case diagnosis

Advisor : **Dr. Ali Tafti**, Associate Professor, Department of Information and Decision Sciences, University of Illinois Chicago

Fellowships & Awards

- 2019 –present **Doctoral Scholarship and CBA Doctoral Fellowship**, Department of Information and Decision Sciences, University of Illinois at Chicago.
- 2019 –present **Graduate Assistantship**, Department of Information and Decision Sciences, University of Illinois at Chicago.

Academic Achievements & Talks

- 2023 **Session Chair of the session " Applications of Deep Learning for Predictive Modeling"** in *Informatics 2023*, Phoenix, USA.
- 2023 Presented **"Predicting Stock Market Trends Utilizing LLMs"** research, at **Informatics 2023**, Phoenix, USA.
- 2023 Presented **"A Comparative Analysis of Fine-Tuned LLMs and In-Context Learning of LLMs for Financial Sentiment Analysis"** research, at **ICAIF'23 Workshop on NLP and Network Analysis in Financial Applications**, New York, USA.

Academic Services

- 2023 **ACM Transactions on Management Information Systems, Special Issue on Impacts of Large Language Models on Business and Management**, Peer Review.

Teaching Assistantship

- IDS 575: **Machine Learning Statistics**, *Fall 2023*, University of Illinois at Chicago.
- IDS 355: **Operations Management**, *Summer 2023*, University of Illinois at Chicago.
- IDS 270: **Introduction to Business Statistics**, *Summer 2022*, University of Illinois at Chicago.
- IDS 521: **Advanced Database Management**, *Spring 2022*, University of Illinois at Chicago.
- IDS 572: **Data Mining for Business**, *Fall 2021, Spring 2022, Fall 2022, spring 2023, Fall 2023*, University of Illinois at Chicago.
- IDS 200: **Introduction to Management Information Systems**, *Fall 2020, Spring 2021, Summer 2021, Fall 2021, Fall 2022, Spring 2023*, University of Illinois at Chicago.
- IDS 570: **Statistics for Management**, *Fall 2020, Spring 2021*, University of Illinois at Chicago.

Skills

- LLMs LangChain, Parameter-Efficient Fine-Tuning (PEFT), Retrieval-Augmented Generation (RAG), Alignment from Human/AI Feedback, DPO, ORDP, LORA Fine-tuning, AutoGen
- Programming Python (Scikit-learn, Keras, TensorFlow, PyTorch, Transformers, HuggingFace), R