

# Mahtab Raeis-danaei

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PhD student in Information & Decision Sciences at UIC, Chicago, IL, USA

## RESEARCH INTERESTS

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**Language Models as Human Simulators:** Developing theory-guided LLM and SLM simulators for practical applications such as incentive design. Building on Chain-of-Thought while showing how structured deliberation grounded in decision science differs from CoT-style reasoning and better captures human thinking and decision-making across different personas.

**Quantization of Reasoning Models and Calibration Data Structure:** Studying how post-training quantization performance depends on the calibration dataset domain and the structure of calibration data. Investigating whether structured, deliberation-style calibration traces can recover base-model reasoning performance better than standard calibration datasets across different quantization methods.

**LLMs and SLMs for Efficient Organizational Deployment:** Studying the characteristics and capabilities of LLMs and SLMs, and how their complementary strengths can be exploited in applied settings. Investigating how SLMs can be efficiently adapted for enterprise use through fine tuning and in context learning, enabling cost effective, private, and controllable deployment for applications such as policy evaluation and incentive design.

## EDUCATION

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**University of Illinois Chicago (UIC)**

*2024–Present*

PhD in Information & Decision Sciences (Business Administration)

GPA: 3.61 / 4.00

Advisor: Prof. Selva Nadarajah, Associate Professor

**Amirkabir University of Technology (AUT)**

*2020–2024*

B.Sc. in Industrial Engineering

GPA: 3.87 / 4.00

Bachelor Thesis: *Prediction of Cardiovascular Diseases Using Machine Learning Algorithms*

## WORKING PAPERS

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- **Modeling How People Think: Structured Deliberation to Improve Language Model Simulations of Human Decision Making.** (with Selva Nadarajah; Daniel R. Jiang)
- **Local Decision Simulation with Quantized LLMs.** (with Selva Nadarajah; Abhilash Chenreddy)

## CONFERENCES & PRESENTATIONS

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**Modeling How People Think: Structured Deliberation to Improve Language Model Simulations of Human Decision Making.** Presented at INFORMS Annual Meeting, Atlanta, *2025*

**Corporate Nature & Biodiversity Reporting in CDP Disclosures: A Large Language Model Study.** Presented at BNEAT Conference, Indiana, *Summer 2025*

## RESEARCH PROJECTS

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- **Corporate Nature & Biodiversity Reporting in CDP Disclosures: A Large Language Model Study** *Summer 2025*  
UIC Energy Resources Center
- **Prediction of Cardiovascular Diseases Using Machine Learning Algorithms** *2024*  
Bachelor's Thesis
- **Reinforcement Learning Control of Ambient Temperature in a Virtual Environment** *2022–2023*  
Course Project, Algorithm Design Foundations
- **Movie Recommendation System** *2022–2023*  
Course Project, Artificial Intelligence
- **Process Modeling, Database Design, and Management Dashboard for a Hospital** *2023–2024*  
Course Project, Management Information Systems

## TEACHING EXPERIENCE AND INTERNSHIPS

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- Teaching Assistant, University of Illinois Chicago (UIC)** *2024–2025*  
Operations Management (Microsoft Excel Skills)
- Teaching Assistant, Amirkabir University of Technology (AUT)** *2022–2024*  
Machine Learning  
Manufacturing Processes  
Motion & Time Study
- Intern, UIC Energy Resources Center** *Chicago, USA*
- Intern, Bahman Motor (Private Car Manufacturing Company)** *Tehran, Iran — 2022*

## HONORS & AWARDS

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- Graduate Fellowship / Scholarship, University of Illinois Chicago *2024–Present*
- Merit-Based Admission to M.Sc. Program, AUT *2023*
- Top 1% among 150,000 participants, National University Entrance Exam (Iran) *2020*

## TECHNICAL SKILLS

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- Programming** Python, R, C, MATLAB, SQL
- Software** MySQL, Power BI, Visual Paradigm, MS Office, Adobe After Effects, Premiere, Photoshop, Illustrator,
- Languages** Persian (Native), English (IELTS 7.5)