HY (GIA) DANG

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RESEARCH INTERESTS

My research focuses on building reliable LLM agents for real-world decision-making tasks that require multi-step reasoning over diverse sources of information. I work at the intersection of retrieval-augmented generation (RAG), tool-augmented language models (TALMs), and learning-based methods to improve agent behavior in imperfect and evolving environments.

Inspired by how human progress is driven by our ability to **use** and **create** tools, my work focuses on two themes:

- **Tool use strategies for realistic data workflows:** enabling LLM agents to *use* tools effectively for dynamic, multi-step reasoning, while also *creating* domain-specific and reliable tools that integrate seamlessly into agentic frameworks to plan, act, and validate over heterogeneous data.
- **Agent framework optimization via signals and learning:** designing task-dependent feedback signals (e.g., verifiability checks, tool outcomes, and consistency/constraint satisfaction) and using them to train or adapt agents to be more correct, robust, and efficient in realistic scenarios.

EDUCATION

University of Notre Dame, Notre Dame, IN *August 2022 - Present*
Ph.D. student in Computer Science and Engineering *GPA: 3.958*
Advisor: Dr. Meng Jiang

Texas Christian University, Fort Worth, TX *August 2017 - December 2021*
B.S. in Computer Science *GPA: 4.0*
B.S. in Mathematics *Departmental Honors*

INDUSTRY EXPERIENCE

Oracle *Redwood City, CA*
Applied Scientist Intern (Applied Science Team) *June 2026 - September 2026*

- Working on Agentic AI

Amazon *Palo Alto, CA*
Applied Scientist Intern (Team Rufus) *September 2024 - May 2025*

- **Project**: Improving the Tool Using and Function Calling Capabilities of LLM(s)
- **Mentors**: Dr. Tianyi Liu, Dr. Zhuofeng Wu, Jingfeng Yang, Dr. Haoming Jiang

RESEARCH PROJECTS

ToolBox Reliability for LLM Agents *May 2025 - present*

- Building a community-driven toolbox to improve tool-integrated LLM reliability by addressing both *tool-use accuracy* and *intrinsic tool accuracy*.

Knowledge Augmented & Tool-Use LLM(s) *September 2024 - present*

- Working on tool-use capabilities of LLM(s).

Factuality In The Wild & Retrieval-Augmented Generation *April 2024 - September 2024*

- Improving automated fact-checking systems, especially for claims in the wild.

Information Retrieval Enhancement Using Text Expansion *August 2022 - April 2024*

- Improving diversity in query expansion in document retrieval.

PUBLICATIONS

4. **Hy Dang**, Tianyi Liu, Zhuofeng Wu, Jingfeng Yang, Haoming Jiang, Tao Yang, Pei Chen, Zhengyang Wang, Helen Wang, Huasheng Li, Bing Yin, Meng Jiang. *Improving Large Language Models Function Calling and Interpretability via Guided-Structured Templates*. The Conference on Empirical Methods in Natural Language Processing (EMNLP 2025).
3. Yining Lu, Noah Ziems, **Hy Dang**, and Meng Jiang. *Optimizing Decomposition for Optimal Claim Verification*. Annual Meeting of the Association for Computational Linguistics (ACL 2025).
2. **Hy Dang**, Minh Nguyen, Bo Mei. StTime-Net: Combining both Historical and Textual Factors for Stock Movement Prediction, in Proceedings of *International Conference on Artificial Neural Networks (ICANN)*, Bristol, UK, 2022
1. Quang Truong, Minh Nguyen, **Hy Dang**, Bo Mei. Housing price prediction via improved machine learning techniques, *Procedia Computer Science 174, 433-442*

WORKSHOP PAPERS (* INDICATES EQUAL CONTRIBUTIONS)

2. **Hy Dang***, Bang Nguyen*, Noah Ziems, Meng Jiang. *Embedding Mental Health Discourse for Community Recommendation*. 4th Workshop on Computational Approaches to Discourse, joint with The 61st Annual Meeting of the Association for Computational Linguistics (ACL 2023).
1. Meng Jiang, **Hy Dang**, Lingbo Tong. *A Quantitative Review on Language Model Efficiency Research*. LLM Symposium in conjunction with International Joint Conference on Artificial Intelligence (IJCAI 2023).

PRESENTATIONS

5. **Hy Dang**, Mengxia Yu, Meng Jiang. *Improving Diversity of Query Expansion in Document Retrieval*. Midwest Speech and Language Days (MSLD 2025).
4. **Hy Dang**. *Wound Healing Modeling Using Partial Differential Equations And Deep Learning*. Presentation at National Collegiate Research Conference (NCRC 2022).
3. **Hy Dang**, Luis Mantilla, S. Zhang, Andy Borum. *Bifurcations of an elastic ring with interacting particles*, Student Talk/Poster Session Presentation at the Canadian Undergraduate Mathematics Conference (CUMC 2020).
2. **Hy Dang**. *Wound Healing Modeling Using Partial Differential Equations And Deep Learning*, Poster Presentation at the 3rd Annual Meeting of the SIAM Texas-Louisiana Section, 2020.
1. **Hy Dang**. *Wound Healing Modeling Using Partial Differential Equations And Deep Learning*, Sixteenth Annual Texas Undergraduate Mathematics Conference (TUMC 2021).

AWARDS & FUNDINGS

Tinker Research Grant *Thinking Machines Lab*
Award Amount: 5,000 in Tinker credits

OpenAI Researcher Access Program *OpenAI*
Award Amount: 10,000 in OpenAI API credits *January 2025 - July 2025*

Best Presentation Award *Notre Dame Data Mining Lab*
Presentation Title: Expansion is all you need *Spring 2023, Spring 2024*

Student Research Symposium Best Poster Award *TCU, Spring 2021*

Science and Engineering Research Center Grant *TCU, Fall 2019*

Academic Achievement Award *TCU, May 2018*

SERVICE

Teaching Assistant at University of Notre Dame: CSE 20110: Discrete Mathematics - Fall 2022, CSE 40171: AI and Society - Spring 2023
Reviewer: TKDE 2023, KnowledgeNLP-KDD'23, ICWSM 2024, ICWSM 2025, ARR Review.