# VENKATESH MISHRA

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## RESEARCH INTEREST

Large Language Models (LLMs), Language Agents, Reasoning and Planning, Post-training

## EDUCATION

**Arizona State University** — Tempe, Arizona
*Doctorate in Computer Science* — *August 2024 - Present*

**Arizona State University** — Tempe, Arizona
*Master of Science in Computer Science* — *Aug 2022 - May 2024*

**National Institute of Technology, Silchar** — Silchar, Assam, India
*Bachelor of Technology in Electronics and Instrumentation* — *Jul 2016 - Jun 2020*

## PUBLICATIONS

1. **Venkatesh Mishra**, Amir Saeidi, Satyam Raj, Mutsumi Nakamura, Jayanth Srinivasa, Gaowen Liu, Ali Payani, Chitta Baral How Can Input Reformulation Improve Tool Usage Accuracy in a Complex Dynamic Environment? A Study on $\tau$-bench. *Findings of Association for Computational Linguistics* **(EMNLP 2025)**

2. **Venkatesh Mishra**, Bimsara Pathiraja, Mihir Parmar, Sat Chidananda, Jayanth Srinivasa, Gaowen Liu, Ali Payani, Chitta Baral. Investigating the Shortcomings of LLMs in Step-by-Step Legal Reasoning. *Findings of Association for Computational Linguistics* **(NAACL 2025)**

3. Shrinidhi Kumbhar, **Venkatesh Mishra**, Kevin Coutinho, Divij Handa, Ashif Iquebal, Chitta Baral. Hypothesis Generation for Materials Discovery and Design Using Goal-Driven and Constraint-Guided LLM Agents. *Findings of Association for Computational Linguistics* **(NAACL 2025)**

4. Neeraj Varshney, Satyam Raj, **Venkatesh Mishra**, Agneet Chatterjee, Ritika Sarkar, Amir Saeidi, Chitta Baral. Investigating and Addressing Hallucinations of LLMs in Tasks Involving Negation. ***NAACL@TrustNLP, 2025***

## WORK EXPERIENCE

**Research Assistant, Cognition and Intelligence Lab, Arizona State University** — *June 2024 - Present*
- Developed an LLM-based multi-agent framework to improve tool-use capabilities in customer-service simulations
- Spearheaded the research for the systematic study of common reasoning errors occurring in LLM-generated rationales to predict legal judgment scenarios.
- Employed various prompt-based mitigation strategies to improve the legal reasoning capabilities of LLMs.
- Implemented the knowledge extraction pipeline for an LLM-based agentic system to evaluate the hypothesis generation capabilities in aiding material science discovery applications.

**Research Aide, W.P Carey School of Business, Arizona State University** — *July 2023 - Nov 2023*
- Collected, cleaned, and analyzed datasets using Teradata RDBMS and Excel to derive research insights.
- Employed NLP models to preprocess datasets through anonymization of personally identifiable information.

**Software Consultant, Oracle Financial Services Software, Bengaluru, India** — *Sep 2020 - Dec 2021*
- Engineered the business logic for 30+ requirements of FLEXCUBE using PL/SQL, JavaScript and Java across 10+ Scrum sprints and 3 release cycles.
- Streamlined automation scripts in the software deployment cycle, reducing deployment time by 30%.

## ACADEMIC PROJECTS

**Enhancing LLM Safety Alignment via Augmented Prompt-Response Finetuning**
- Leveraged prompt-engineering techniques to create a synthetic dataset of 1000+ harmful prompts and corresponding safe responses for injection into an instruction-tuning dataset for LLM alignment.
- Augmented Supervised Finetuning of Llama-2-7B LLM with Alpaca dataset and the prompt-response pairs.
- Utilized GPT-3.5-turbo and Vicuna-33B as LLM-as-judges to evaluate the finetuned model outputs.

## SKILLS

**Programming Languages:** Python, C++, Java, PL/SQL, JavaScript
**Libraries and Tools:** PyTorch, HuggingFace, Git, LangChain, OpenAI, Linux