Shreya Nupur Shakya

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RESEARCH INTERESTS

Efficient and Adaptive Reasoning; Interpretability and Representation Probing; AI Agents; Multilingual and Cross-Cultural NLP; Multimodal Learning; Trustworthy AI

EDUCATION

University of Arizona December 2025
Master of Science in Computer Science, GPA: 3.6/4.0 Tucson, AZ
Graduate Certificate in Natural Language Processing

Jain University May 2021
Bachelor of Technology in Computer Science and Engineering, CGPA: 9.3/10, Rank: 2/∼500 Bangalore, India

PUBLICATIONS

[1] Zijie Wang, Md Mosharaf Hossain, Shivam Mathur, Terry Cruz Melo, Kadir Bulut Ozler, Keun Hee Park, Jacob Quintero, MohammadHossein Rezaei, **Shreya Nupur Shakya**, Md Nayem Uddin, and Eduardo Blanco. 2023. Interpreting Indirect Answers to Yes-No Questions in Multiple Languages . In **Findings of the Association for Computational Linguistics: EMNLP 2023**, pages 2210–2227.

[2] Shashikala H. K., **Shreya Nupur Shakya**, Pooja Panjiyar, Abhinav Singh Upreti, and Shaik Dadapeer. 2022. Attendance Monitoring System Using Face Recognition . **International Journal of Information Technology, Research and Applications**, 1(3), 15–22.

[3] Shashikala H. K., **Shreya Nupur Shakya**, Pooja Panjiyar, Abhinav Singh Upreti, and Shaik Dadapeer. 2020. Survey on Iris Based Recognition Systems . **IJSHRE**, Vol. 8, Issue 12, pp. 59–62.

SELECTED RESEARCH PROJECTS

Adaptive Reasoning and Tool Routing from LLM Hidden States
Independent Research Project | *2026*

- Investigating whether pre-generation hidden states encode signals that predict when language models require external tools or additional reasoning.
- Constructed an evaluation set of 180 labeled problems across 15 task environments and analyzed Qwen3-1.7B representations; a lightweight probe predicted tool necessity with an AUROC of approximately 0.96.
- Developed adaptive routing strategies using these signals, achieving approximately 85% task success under an 80% tool-allocation budget, and analyzed transfer between reasoning-necessity and tool-necessity representations.

Minimal Chain-of-Thought Reasoning in Low-Resource Languages
LING 582 – Advanced Statistical Natural Language Processing, University of Arizona | *2025*

- Studied whether shorter reasoning traces can preserve LLM reasoning performance in a low-resource language while reducing inference cost.
- Compared No-CoT, Minimal-CoT, and Standard-CoT using Llama-3-8B-Instruct and Qwen2.5-7B-Instruct across English and Nepali mathematical reasoning, measuring accuracy, token usage, and inference time.
- Found that Minimal-CoT retained approximately 95–100% of Standard-CoT accuracy in three of four model–language settings while using 68–81% of its token budget; analyzed failures involving truncation, semantic grounding, reasoning drift, and repetition.

RESEARCH EXPERIENCE

University of Arizona
Research Contributor – Interpreting Indirect Answers to Yes-No Questions in Multiple Languages *Advisor: Dr. Eduardo Blanco*

- Contributed to research on multilingual pragmatic language understanding, focusing on how indirect answers to yes–no questions are interpreted across languages.

- Created and validated Nepali language data using native-language judgments of context-dependent answers and supported evaluation of cross-lingual transfer across eight languages.
- Co-authored the resulting work published in *Findings of EMNLP 2023*.

University of Arizona
Research Contributor – SexTok *Advisor: Dr. Mihai Surdeanu*

- Supported development of a 1,000-video multimodal dataset for distinguishing sex-educational, sexually suggestive, and other TikTok content.
- Annotated context-sensitive social-media content using visual and linguistic cues to support multimodal content classification.
- Recognized in the acknowledgements of the resulting *Findings of ACL 2023* paper for data annotation contributions.

University of Arizona Fall 2021
Graduate Research Assistant *Advisor: Dr. Katherine E. Isaacs*

- Explored visualization methods for understanding compiler optimization behavior through static and dynamic program analysis.
- Developed an interactive visualization system using Dyninst APIs and D3.js to expose code-optimization behavior and support analysis of program transformations.

TEACHING EXPERIENCE

University of Arizona 2022 – 2025
Course Instructor, Department of Computer Science Tucson, AZ

- Independently led undergraduate courses in Software Development and Web Programming, delivering lectures and hands-on instruction in programming, software engineering, and web technologies.
- Designed assignments, assessments, and grading rubrics; evaluated student performance and held office hours.
- **CSC 210 – Software Development** Summer 2025
- **CSC 337 – Web Programming** Summer 2023, Summer 2022

University of Arizona 2022 – 2025
Graduate Teaching Assistant, Department of Computer Science Tucson, AZ

- Assisted instructors with course administration and assessment, including setting up Gradescope and D2L, organizing grading workflows, holding office hours, and contributing to grading rubrics when needed.
- **CSC 337 – Web Programming** Fall 2025, Spring 2022
- **CSC 346 – Cloud Computing** Spring 2025
- **CSC 452 – Operating Systems** Fall 2023, Fall 2022
- **CSC 483/583 – Text Retrieval and Web Search** Spring 2023

TECHNICAL SKILLS

Programming: Python, Java, C/C++, SQL, JavaScript

ML/NLP Libraries: PyTorch, TensorFlow, Hugging Face Transformers, scikit-learn

Research Methods: Language Model Evaluation, Representation Probing, Multilingual NLP, Data Annotation, Error Analysis, Prompting

Tools/Platforms: Git, Docker, Linux, Jupyter