

YANYAN DONG

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RESEARCH INTEREST

My research focuses on natural language processing, human-AI interaction, and intelligent system design: designing and evaluating AI-driven systems that are interpretable, trustworthy, and impactful in real-world applications.

EDUCATION

2025 - Present **University of Arizona**

Ph.D. in Information

Advisors: Dr. Steven Bethard & Dr. Sandra Bae | CLU Lab & D-REP Lab

2023 - 2025 **University of Arizona**

M.S. in Information

RESEARCH EXPERIENCE

FALL 2025 - PRESENT **Agent Visualization for Human-AI Collaboration** | University of Arizona

Advisors: Dr. Sandra Bae, Dr. Steven Bethard

Objective: Design human-AI collaborative systems that support user oversight and informed decision-making in agentic workflows.

- Developing human-centered interfaces that support user decision-making when collaborating with AI agents.
- Conducting user studies to investigate how interface design impacts user comprehension, trust, and decision quality when working with AI agents.

SPRING 2023 - PRESENT **AI-Powered Safety System for Mining Industry** | University of Arizona

Advisor: Dr. Leonard D. Brown

Objective: Develop an AI-powered system that provides safety recommendations tailored to specific mining work environments.

- Conducted domain-specific pretraining of transformer models (RoBERTa) and fine-tuned classifiers on a 16k-sample dataset for multi-label injury prediction.
- Developed a RAG-enhanced LLM framework using few-shot prompting to generate safety recommendations grounded in mining-specific knowledge.
- Designing a validation pipeline to assess the quality of generated safety recommendations.

SPRING 2024 - PRESENT **Research Opportunity Success System** | University of Arizona

Advisor: Dr. Moe Momayez

Objective: Develop a generative AI-based system to identify highly relevant mining and minerals research opportunities for faculty and researchers.

- Designed and administered surveys to identify faculty needs and iteratively refined system design based on feedback.
- Built a multi-source data pipeline aggregating 840+ grants from 7 international funding sources, with embedding-based filtering and LLM-powered relevance evaluation.

- Developed a RAG-based web application that summarizes grant opportunities and reports relevance to individual researcher profiles.

SPRING 2024 **Temporal Information Extraction** | University of Arizona

Advisor: Dr. Steven Bethard

Objective: Extract event-event, event-time, and time-time temporal relations from unstructured text.

- Preprocessed benchmark datasets (e.g., MATRES, TimeBank Dense) into multiple task formats, including pairwise sequence classification and natural language inference.
- Fine-tuned RoBERTa models to establish baselines across temporal relation extraction tasks.
- Built an efficient inference pipeline with open-source LLMs (Flan-T5, Vicuna-7b, Mistral-7b) via vLLM and applied prompt engineering.
- Fine-tuned LLMs using Low-Rank Adaptation (LoRA) for improved task performance.

FALL 2023 **Topic Analysis of NSF Grant Proposals** | University of Arizona

Advisor: Dr. Bryan Heidorn

Objective: Investigate the evolution of NSF grant research topics over the past two decades.

- Conducted exploratory data analysis (e.g., document length, noise analysis) and performed data preprocessing.
- Developed topic modeling approaches (e.g., LDA) on NSF grant proposal data and analyzed the resulting topics.
- Applied clustering algorithms to proposals represented via Bag-of-Words and pretrained transformer embeddings, and conducted manual annotation to assess cluster quality.
- Visualized results using pyLDAvis and word clouds, and performed manual interpretation of identified topics.

PUBLICATIONS

CONFERENCE PAPERS

Yanyan Dong and Leonard D. Brown. Applying Generative AI to Job Hazard Analysis and Safety Observation Reports. *MINEXCHANGE SME Annual Conference & Expo 2025 (manuscript)*.

Yanyan Dong, Leonard D. Brown, Hong Cui, and Jeff Burgess. Injury Prediction and Root Cause Analysis Using Large Language Models. *MINEXCHANGE SME Annual Conference & Expo 2024 (manuscript)*.

AWARDS AND DISTINCTION

2025 Distinguished Graduate Scholar, College of Information Science, University of Arizona.

TECHNICAL SKILLS

Languages: Python, SQL, R, JavaScript, Bash, HTML/CSS, $\text{\LaTeX}$

Frameworks & Libraries: PyTorch, Hugging Face Transformers, Scikit-learn, Keras, Sentence Transformers, PEFT/LoRA, vLLM, React, Bootstrap, Firebase

Tools & Platforms: Git, Docker, Linux, Slurm, REST APIs, Tableau, Power BI, Figma

Spoken Languages: English, Mandarin, Cantonese