Aneesh Komanduri

(479) 544-8693
akomand.github.io/
aneesh.komanduri@gmail.com
github.com/akomand

Education

University of Arkansas — Fayetteville, Arkansas

Doctor of Philosophy (Ph.D.), Computer Science — **Aug 2021 - May 2026**

- **Advisor:** Dr. Xintao Wu

Master of Science (M.S.), Computer Science, GPA: 4.0 — **2021 - 2024**

Bachelor of Science (B.S.), Computer Science & Mathematics — **2017 - 2021**

Skills

- **Programming Languages:** Python, C/C++, Java, Javascript, SQL
- **ML Frameworks:** PyTorch, Tensorflow, scikit-learn, Pyro
- **ML Concepts:** Large (Vision) Language Models (LLM/VLM), Diffusion Models, Parameter-efficient Fine-tuning (e.g., LoRA), LLM Agents, Retrieval Augmented Generation (RAG), Variational Autoencoders, Flow-based Models, Causal Machine Learning, Graph Neural Networks
- **Research Expertise**: Generative Modeling, Representation Learning, Causal Modeling, Machine Unlearning, Large Vision-Language Models, Trustworthy Artificial Intelligence
- **Technologies:** LangChain, MCP, A2A, Flask, Django, AWS, Databricks, Postgres
- **Applications:** LaTeX, Jupyter Notebook, VSCode, PyCharm, Git, RStudio, MATLAB

Industry Experience

NEC Laboratories America, Inc. — Princeton, New Jersey

Research Intern, Data Science & System Security — **May 2025 - Aug 2025**

- Developed core components of an in-house LLM-based AI chatbot system for multi-aspect IT Ticket service requests data
- Designed a hybrid concept and embedding refinement framework for historical ticket data to achieve efficient retrieval augmented generation (RAG) for new user requests
- Implemented a post-hoc weakly-supervised solution-aware contrastive learning algorithm to learn context-rich refined semantic embeddings for improved RAG performance compared to baselines

Phillips 66 — Bartlesville, Oklahoma

Digital Security and Cloud Engineering Intern — **May 2020 - Aug 2020**

- Developed infrastructure as code templates with Terraform and built CI/CD pipelines for the creation of resources such as SQL Servers, Blob Storages, Key Vaults, and Firewall rules for Azure Data Factory in a production environment
- Automated the process of keeping inventory on cloud instance security group rules for accounts throughout the company by creating a Python script to pull data using the Dome9 REST API

Research Experience

Social Awareness & Intelligent Learning Lab (SAIL) — Fayetteville, Arkansas

Graduate Research Assistant — **Oct 2021 - Present**

- Proposed theory and learning frameworks toward identifiable causal representation learning, high-fidelity counterfactual generation, and causal reasoning from visual input
- Currently investigating causal reasoning in large vision-language models, interpretability in large-scale generative models, and applications of causal generative modeling in healthcare
- Published research papers at several top-tier conferences and journals such as IJCAI, ECAI, AAAI, EMNLP, and TMLR[1]

[1] See my Google Scholar for a full list of publications: scholar.google.com/citations?user=IMtCc1QAAAAJ&hl=en

Publications

Karuna Bhaila, **Aneesh Komanduri**, Minh-Hao Van, and Xintao Wu. Cross-Modal Attention Guided Unlearning in Large Vision-Language Models. ***Lock-LLM Workshop@NeurIPS***. 2025.

Aneesh Komanduri, Karuna Bhaila, and Xintao Wu. CausalVLBench: Benchmarking Visual Causal Reasoning in Large Vision-Language Models. *Proceedings of the 2025 Conference on Empirical Methods in Natural Language Processing (**EMNLP Main**)*. 2025.

Aneesh Komanduri. Toward Causal Generative Modeling: From Representation to Generation. *Proceedings of AAAI Conference on Artificial Intelligence (**AAAI**)*. 2025.

Aneesh Komanduri, Chen Zhao, Feng Chen, and Xintao Wu. Causal Diffusion Autoencoders: Toward Counterfactual Generation via Diffusion Probabilistic Models. *Proceedings of 27th European Conference on Artificial Intelligence (**ECAI**)*. 2024.
**Also appeared in non-archival Generative Models for Computer Vision Workshop at CVPR 2024*

Aneesh Komanduri, Yongkai Wu, Feng Chen, and Xintao Wu. Learning Causally Disentangled Representations via the Principle of Independent Causal Mechanisms. *Proceedings of the 33rd International Joint Conference on Artificial Intelligence (**IJCAI**)*, 2024.
**Also appeared in non-archival Causal Representation Learning Workshop at NeurIPS 2023*

Aneesh Komanduri, Xintao Wu, Yongkai Wu,and Feng Chen. From Identifiable Causal Representations to Controllable Counterfactual Generation: A Survey on Causal Generative Modeling. *Transactions on Machine Learning Research (**TMLR**)*. 2024.

Aneesh Komanduri, Yongkai Wu, Wen Huang, Feng Chen, and Xintao Wu. SCM-VAE: Learning Identifiable Causal Representations via Structural Knowledge. *IEEE International Conference on Big Data (**BigData**)*, 2022.

Aneesh Komanduri and Justin Zhan, Neighborhood Random Walk Graph Sampling for Regularized Bayesian Graph Convolutional Neural Networks. *IEEE International Conference on Machine Learning and Applications (**ICMLA**)*, 2021.

Honors and Awards

1st Place Graduate Student Poster @ NSF 2024 DART Conference ($1,500) — Sep. 2024
Awarded by Arkansas Economic Development Commission (AEDC)

Doctoral Academy Fellowship ($48,000) — 2021-2025
University of Arkansas Graduate School and International Education

Congressional Letter for STEM Outreach — July 2021
U.S. House of Representatives

Lawrence Jesser Toll, Jr. Endowed Scholarship ($1,000) — 2020-2021
University of Arkansas Department of Mathematical Sciences

Silas Hunt Distinguished Scholarship ($32,000) — 2017-2021
University of Arkansas

Service

Conference Reviewer: AAAI'26, ECAI'25, KDD'25, PAKDD'25, IJCAI'25, ICML'25, ICLR'25, NeurIPS'24, LoG'24, ICMLA'24

Journal Reviewer: TMLR, DMLR, IJDSA, Pattern Recognition, IEEE Access

Workshop Reviewer: Causality and Large Models Workshop (CaLM@NeurIPS'24), Structured Probabilistic Inference and Generative Modeling Workshop (SPIGM@ICML'24)