

# Aneesh Komanduri

---

## CONTACT INFORMATION

✉ [akomandu@uark.edu](mailto:akomandu@uark.edu)

🌐 [akomand.github.io/](https://akomand.github.io/)

🐙 [github.com/akomand](https://github.com/akomand)

## RESEARCH INTERESTS

My research interests generally lie in the areas of causal inference, representation learning, and generative modeling, with applications in trustworthy and robust machine learning. I am also interested in exploring applications of causal generative models in domains such as healthcare.

## EDUCATION

**University of Arkansas**

Fayetteville, Arkansas

**Ph.D.**, Computer Science

**2021 - 2026**

- **Advisor:** Dr. Xintao Wu

**M.S.**, Computer Science, GPA: 4.0

**2021 - 2024**

- **Relevant Courses:** Statistical Methods, Regression Analysis, Machine Learning, Deep Learning, Computer Vision, Natural Language Processing, Advanced Information Retrieval, AI Ethics

**B.S.**, Computer Science/Engineering & Applied Mathematics

**2017 - 2021**

- Graduated *Summa Cum Laude*

## SKILLS

- Languages: Python, C/C++, Java, Javascript, SQL
- ML Frameworks: PyTorch, Tensorflow, scikit-learn, Pyro
- Machine Learning: Large Language Models, Diffusion Probabilistic Models, Parameter Efficient Fine-tuning (e.g., LoRA), Variational Autoencoders, Normalizing Flows, Causality
- Technologies: Flask, Django, AWS, Databricks, Postgres, Apache Spark, ReactJS
- Applications:  $\LaTeX$ , Jupyter Notebook, VSCode, PyCharm, Git, RStudio, MATLAB

## 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 in the label-supervised setting using VAE and flow-based models
- Currently working on counterfactual generation via diffusion-based causal representation learning, applications of causal generative models in fairness-aware learning, and causality in large-scale generative models such as large language models (LLMs) and pre-trained diffusion models

**Data Science & Artificial Intelligence Lab**

Fayetteville, Arkansas

*Undergraduate Research Assistant*

**Aug 2019 - May 2021**

- Research focused on graph representation learning and using Bayesian methods to account for uncertainty in noisy graph data to improve node classification
- Designed and developed a cyber-argumentation discourse-based platform and utilized natural language processing and knowledge graph-based models for user opinion modeling

## PEER-REVIEWED PUBLICATIONS

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

**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.

**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.

**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 DART 2024 Annual Conference)	Sep. 2024
	Doctoral Academy Fellowship	2021-2025
	Congressional Letter for STEM Outreach, U.S. House of Representatives	July 2021
	Lawrence Jessor Toll, Jr. Endowed Scholarship	2020-2021
	Silas Hunt Distinguished Scholarship	2017-2021

SERVICE	<b>Conference Reviewer:</b> IJCAI’25, ICML’25, ICLR’25, NeurIPS’24, LoG’24, IEEE ICMLA’24 <b>Journal Reviewer:</b> TMLR, DMLR, IJDSA <b>Workshop Reviewer:</b> FPI@ICLR’25, CaLM@NeurIPS’24, SPIGM@ICML’24
---------	--

TEACHING & MENTORSHIP EXPERIENCE	<b>UNITE, Army Educational Outreach Program (AEOP)</b> Fayetteville, Arkansas <i>Lead Research Mentor</i> ( <a href="https://github.com/akomand/AEOP_Research_2021">https://github.com/akomand/AEOP_Research_2021</a> ) <b>2020, 2021</b>
	<ul style="list-style-type: none"> <li>• Guided High School students from underrepresented communities with research in data science</li> <li>• Created lesson plans to teach data/text preprocessing, classification/regression, word embeddings, entity extraction, topic modeling, language models, transformers, implementations in Python, deep learning pipeline in PyTorch, and applications in question answering</li> <li>• Assisted students in the development of a machine learning research paper and helped students present research to be evaluated by the Department of Defense education initiative</li> </ul>

<b>University of Arkansas</b> <i>Teaching Assistant</i>	Fayetteville, Arkansas <b>Jan 2020 - Dec 2020</b>
<ul style="list-style-type: none"> <li>• <b>Courses:</b> CSCE 2004 (Programming Foundations I) and CSCE 3193 (Programming Paradigms)</li> <li>• Taught two lab sections weekly for a total of over 45 computer science &amp; engineering students and held office hours for over 200 students</li> <li>• Created, debugged, graded, and provided feedback on object-oriented and functional programming assignments (C++/Java/Python) and exams and held office hours for 200+ students</li> </ul>	

INDUSTRY EXPERIENCE	<b>Phillips 66</b> Bartlesville, Oklahoma <i>Digital Security and Cloud Engineering Intern</i>	<b>May 2020 - Aug 2020</b>
	<ul style="list-style-type: none"> <li>• 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</li> <li>• 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</li> </ul>	