

Zainab Aamir

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EDUCATION

Stony Brook University, Stony Brook, NY, USA

Sep 2021 – Oct 2027

Ph.D. in Computer Science, Advisor: Dr. Arie Kaufman – GPA: 3.9

Lahore University of Management Sciences, Lahore, Pakistan

Aug 2017 - May 2021

B.Sc. (Honours) in Computer Science - GPA: 3.5

EXPERIENCE

Multimodal Generative AI Research Intern | GE Vernova

Aug 2026 – Nov 2026

- Developing multimodal generative models for wind turbine VR simulation, generating scene and asset content conditioned on physical and operational parameters. (*Diffusers, OpenUSD, CLIP*)
- Building agentic workflows for power grid analysis pipelines, combining retrieval-augmented generation over technical documentation with MCP-based tool access to internal data systems. (*LangGraph, MCP, Python*)

Machine Learning Engineering Intern | Core Ads Ranking, Reddit

May 2026 – Aug 2026

- Ran a multi-seed HPT study on Reddit Progressive Layered Extraction purchase-conversion model, lifting click-through PRAUC by $+3.2\sigma$ with better calibration. (*PyTorch, Ray, MLflow*)
- Extended the binary objective to multi-conversion counts via MaskedPoissonLoss, quantifying ranking vs calibration trade-offs under train/serve caps.

Graduate Research Assistant | Center for Visual Computing, Stony Brook University, NY

Sep 2021 - Present

- Conducting research in immersive analytics and human-computer interaction, focusing on large-scale XR (AR/VR/MR) environments and user-centered evaluation. (*Python, C#*)
- Developing and prototyping immersive visualization and interactive interfaces for immersive facilities: FlexiCAVE and SILO. (*Unity/C#, OpenGL, NVIDIA Mosaic*)
- Developing LLM-assisted analytics frameworks and agents to analyze and visualize user behaviors in XR environments. (*PyTorch, LangChain*)

SELECT PROJECTS

Explainable XR

- Built an LLM-driven analytics framework standardizing multimodal XR interaction data, modeling relationships between user actions, intent, and environmental context; integrated CLIP for open-vocabulary event detection and semantic scene understanding.
- Built an interactive interface translating XR session data into interpretable visualizations, improving actionable insight discovery by 50%.

Immersive Display Facilities and Visualization Frameworks

- Designed and built FlexiCAVE, the world's highest-resolution configurable stereo display (40 LCD panels, 83M pixels, five hinged columns rotating to 90°), with a multi-node multi-GPU OpenGL framework for synchronized low-latency rendering across FlexiCAVE and SILO.

Visual Analytics for Vegetation Encroachment on Power Infrastructure

- Built a CV pipeline combining semantic segmentation and monocular depth estimation on aerial imagery for 3D scene understanding of vegetation and power infrastructure, reducing height-estimation error to $<0.2\text{m}$.
- Designed a human-AI annotation workflow pairing model predictions with expert feedback for large-scale geospatial datasets.

SELECT PUBLICATIONS

FlexiCAVE: A Dynamically Configurable High-Resolution Display Facility

Zainab Aamir, Saeed Boorboor, Ahamed Shoaib, Arie E. Kaufman. Proceedings of ACM Human-Computer Interaction, ACM ISS'26

Scale-Aware Navigation of Astronomical Survey Imagery Data on High Resolution Immersive Displays

Ava Nederlander, Zainab Aamir, Arie E. Kaufman. IEEE VRW'26

Explainable XR: Understanding User Behaviors of XR Environments using LLM-assisted Analytics Framework

Yoonsang Kim, Zainab Aamir, Mithilesh Singh, Saeed Boorboor, Klaus Mueller, Arie E. Kaufman. IEEE TVCG, presented at IEEE ISMAR, 2025

Agentic AI: A Case Study on Visualization Publications Dataset

Zainab Aamir, Saeed Boorboor, Arie E. Kaufman. Poster, IEEE VIS'25

Improving Developers' Understanding of Regex Denial of Service Tools through Anti-Patterns and Fix Strategies

Sk Adnan Hassan, Zainab Aamir, Dongyoon Lee, James C. Davis, and Francisco Servant. IEEE S&P'23