Zainab Aamir

(631) 681-3231 ⋄ zaamir@cs.stonybrook.edu ⋄ linkedin ⋄ aamirzainab.github.io

EDUCATION

Stony Brook University, Stony Brook, NY, USA *Aug 2021 - Dec 2026*
Ph.D. in Computer Science, Advisor: Dr. Arie Kaufman - GPA: 3.8

Lahore University of Management Sciences, Lahore, Pakistan *Aug 2017 - May 2021*
B.Sc. (Honours) in Computer Science - GPA: 3.5

EXPERIENCE

Graduate Research Assistant | Center for Visual Computing, Stony Brook University, NY *Aug 2021 – Present*

- Conducting research in immersive visualization and XR (AR/VR/MR), developing AI-driven frameworks/agents to model and understand user behaviors *(Python, PyTorch, LangChain)*
- Prototyping and evaluating user-centered interactive interfaces through controlled studies in immersive environments, integrating behavioral metrics with qualitative feedback to assess effectiveness.
- Developing and prototyping scalable visualization and interactive frameworks for immersive facilities: FlexiCAVE,SILO,Reality Deck. *(Unity/C#, OpenGL, NVIDIA Mosaic)*

PROJECTS

Explainable XR

- Built an end-to-end LLM-assisted analytics framework to model and visualize user behaviors in XR environments.
- Developed a real-time visualization interface for for on-the-fly delivery of user behavior insights.
- Conducted expert user studies, demonstrating a 50% improvement in actionable insight delivery for XR applications.

Immersive Display Facilities and Visualization Frameworks

- Designed and built the FlexiCAVE: the world's highest-resolution configurable stereo display, comprising 40 LCD panels (83 million pixels) in a 3.14 m×2.14 m array with five hinged columns that rotate up to 90°.
- Engineered a scalable multi-node, multi-GPU OpenGL framework for synchronized, low-latency rendering across FlexiCAVE & SILO, applied as a testbed for HCI experiments in large-scale AR/VR displays.

Interactive Visual Analytics for Vegetation Encroachment on Power Infrastructure

- Developed a computer vision pipeline for aerial imagery using semantic segmentation and depth estimation, reducing vegetation height-estimation error to <0.2m.
- Designed a human–AI annotation workflow that combined model predictions with expert feedback, improving labeling efficiency and accuracy for large-scale geospatial aerial datasets.

SELECT PUBLICATIONS

Agentic AI: A Case Study on Visualization Publications Dataset
***Zainab Aamir**, Saeed Boorboor, Arie E. Kaufman.* **IEEE VIS 2025 (Poster)**

FlexiCAVE: A Dynamically Configurable High-Resolution Display Facility
***Zainab Aamir**, Saeed Boorboor, Ahamed Shoaib, Arie E. Kaufman.* **Under Review**

Explainable XR: Understanding User Behaviors of XR Environments using LLM-assisted Analytics Framework
Zainab Aamir, Yoonsang Kim*, Mithilesh Singh, Saeed Boorboor, Klaus Mueller, Arie E. Kaufman.* **IEEE TVCG**, presented at **IEEE ISMAR**, 2025

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**

TECHNICAL STRENGTHS

Languages & Programming Python, Java, JavaScript, C, C++, C#, MATLAB, Three.js, D3.js
AI & Machine Learning PyTorch, TensorFlow, scikit-learn, Hugging Face,LangGraph
Prototyping & XR Unity (C#), Unreal Engine, OpenXR, AR Foundation (ARCore/ARKit), Swift
Domain Experience Augmented Reality, Virtual Reality, Artificial Intelligence & Machine Learning, Agentic AI, Human-Computer Interaction, Large-Scale Visualization & Immersive Facilities,

LEADERSHIP, SERVICE, AND AWARDS

Peer Reviewer: IEEE VIS 2025, IEEE PacificVis 2026
Artifact Reviewer: ACM LCTES
Leadership: President, Graduate Women in Science and Engineering; Treasurer, Women in PhD in Computer Science
Grants: ACM CCS Student Conference Grant; Computing Research Association's Grad Cohort for Women