Zainab Aamir

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EDUCATION

Stony Brook University, Stony Brook, NY, USA *Aug 2021 - Dec 2025*
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 | Stony Brook University, NY, USA *Aug 2021 - Dec 2025*

Graduate Teaching Assistant | Stony Brook University, NY, USA *Jan 2022 - Jan 2023*

Application Developer | Grey Matter Global Consultancy, Lahore, Pakistan *Jan 2020 - May 2020*

PROJECTS

Explainable XR

- Developed an end-to-end framework leveraging LLMS to analyze user behaviors across AR, VR, and MR environments
- Designed and developed a dynamic web interface using D3.js and Three.js that allows real-time user input to generate and display customized insights
- Conducted expert user studies, demonstrated a 50% improvement in delivering actionable insights for XR applications

Immersive Display Facilities

- Engineered a multi-node, parallelized, and scalable OpenGL framework for real-time rendering and synchronization of SILO, an immersive stereoscopic cylindrical tiled-display facility with 168 high-density LCD displays and 619 million pixels
- Leveraged NVIDIA Quadro Sync II boards and Mosaic for multi-display integration and alignment across 6 RTX A6000 nodes
- Designed and constructed the Flexigon, a dynamically reconfigurable high-resolution stereo powerwall facility comprising 40 LCD displays, designing immersive applications that adapt in real-time to changing layouts

Vegetation Encroachment Visualization for Critical Infrastructure Monitoring

- Designed and deployed a crowdsourcing tool for annotating powerlines in drone imagery, creating a custom dataset to train and fine-tune a Fast-SCNN model
- Developed a vegetation encroachment pipeline for energy infrastructure, integrating DepthPro with EXIF metadata to refine results and calculate accurate height and world-space coordinates for precise detection

Linux Stackable File System

- Developed a Linux stackable file system on 'wrapfs' to mimic the secure recycling bin file system present in Windows and macOS
- Modified kernel source code to integrate the file system and allow asynchronous file operations

Web Page Rendering Enhancement for Bigger Screen Ecologies

- Developed a Unity based rendering engine to enhance webpages for large scale displays
- Identifying and extracting relevant DOM attributes of a webpage to scale and adjust their display locations for viewing on larger screen ecologies, tested on a 3x2 screen setup (5120 x 1440 - 48")

PUBLICATIONS

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 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, Tools, Frameworks: Python, Java, Javascript, C, C++, C#, Unity, Unreal Engine, AR Foundation (ARCore/ARKit), Swift, OpenGL, VTK, OpenCV, Visual Studio, Git, .NET, MATLAB
Domain Experience: Augmented Reality (AR), Virtual Reality (VR), Mixed Reality (MR), Immersive Facilities