





# MUHAMMAD HASHAM QAZI

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## RESEARCH INTERESTS (PROJECT SLIDES)

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My research interests lie at the intersection of Human-Computer Interaction (HCI), Artificial Intelligence (AI), Computer Graphics (CG), and Extended Reality (XR). I focus on exploring Intelligent 3D User Interfaces, Multimodal Interactions, and Context-Aware Systems. My work in XR centers on designing solutions for education and training, enhancing learning experiences, and enabling immersive collaboration through Social XR. Additionally, I am interested in interactive Virtual Agents, 3D Human Motion Generation, and Procedural Generation. Ultimately, I aim to create intuitive, AI-driven interactive XR systems that foster dynamic collaboration between humans and machines.

## EDUCATION

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### Habib University

Aug. 2019 – May 2023

*Bachelor of Science in Electrical Engineering*

*Karachi, Pakistan*

- **GPA:** 3.88/4.00
- **Class Rank:** 1
- **Awards:**
  - \* 65% Merit-based Scholarship, High Academic Achievement Scholarship Fall 2020 & Spring 2021
  - \* Dean's List (Top 10% of School) - Fall 2020, Spring 2021, Spring 2023
  - \* Best Capstone (Final Year Project) Award
  - \* Dean's Medal Award (Highest CGPA in Electrical Engineering Class of 2023)
- **Capstone Thesis:** A Virtual Reality-based training platform for emergency fire handling services
- **Capstone Advisors:** Dr. Farhan Khan (Habib University), Dr. Jeeun Kim (Texas A&M University), Dr. Edgar J. Rojas-Munoz (Texas A&M University)
- **Thesis presented at:** Texas Human-Computer Interaction (TxHCI) Seminar (Virtual), 20th International Conference on Frontiers of Information Technology (FIT'23)
- **Leadership Positions:** Chapter Lead - Habib University Mindstorm Chapter (*Game Dev Club*), Core Team Member - HUCon 4Ever (*Comic Con Event*), Treasurer - The Multiverse Club (*Media Fandom Club*)
- **Other Extracurricular Activities:** Graphic Designer - Google DSC x CSEC Habib (*Computer Science Club*), Graphic Designer - Tezhib Undergraduate Research Journal (*Humanities Undergraduate Research Journal*), Design Team Member - HUCon 3000 (*Comic Con Event*)

## PUBLICATIONS

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### [1] Developing a VR-based Training Platform for Emergency Fire Handling Services Using Unity 3D

Muhammad Hasham Qazi, Farhan Khan, Jeeun Kim, Edgar J. Rojas-Munoz.

*Proceedings of 2023 20th International Conference on Frontiers of Information Technology (FIT), IEEE.*

10.1109/FIT60620.2023.00028

### [2] AccessLens: Auto-detecting Inaccessibility of Everyday Objects

Nahyun Kwon, Qian Lu, Muhammad Hasham Qazi, Joanne Liu, Shu Kong, Jeeun Kim

*CHI '24: Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems*

10.1145/3613904.3642767

### [3] Introducing VAIFU: A Virtual Agent for Introducing and Familiarizing Users in VR

**Muhammad Hasham Qazi**, Muhammad Palize Qazi  
2023 4th International Conference on Computing, Mathematics and Engineering Technologies (iCoMET), IEEE.  
10.1109/iCoMET57998.2023.10099242

**[4] A Comparative Survey of Solutions to Russel’s Paradox**  
Fizza Rubab, Shamsa Hafeez, **Muhammad Hasham Qazi**, Mujtaba Hassan Syed, Badar Irfan Azeemi, Aeyaz Jamil Kayani  
2023 4th International Conference on Computing, Mathematics and Engineering Technologies (iCoMET), IEEE.  
10.1109/iCoMET57998.2023.10099262

**[5] (Accepted, To Be Published) LLM-Guided Speech Processing for 3D Human Motion Generation**  
**Muhammad Hasham Qazi**, Sandesh Kumar, Farhan Khan  
IEEE 2024 26th International Multitopic Conference (INMIC)

**[6] (Under Review) Designing Modular Virtual Reality Firefighting Training Simulations**  
**Muhammad Hasham Qazi**, Farhan Khan, Edgar J. Rojas-Munoz, Jeeun Kim.

**[7] (Under Review) Towards Personalized 3D User Interface Authentication in Virtual Reality**  
**Muhammad Hasham Qazi**, Farhan Khan

**WORK EXPERIENCE**

**Astera Software** **Aug. 2024 – Present**  
*Researcher, Astera AI Lab* *Karachi, Sindh*

- Enhanced knowledge retrieval for AI applications through Retrieval-Augmented Generation methodologies.
- Developed a RAG-enhanced multi-agent architecture as a co-pilot system that enabled natural language-driven creation of low-code data pipelines for Astera Software.
- Implemented document-denoising techniques to improve OCR accuracy and designed workflows for unstructured data extraction, enabling efficient information retrieval from complex sources.
- Focused on accessible AI integration within existing systems, enhancing user interaction through NLP-powered interfaces.

**Habib University** **Feb. 2024 – Jun. 2024**  
*Research Assistant (Part-time), Graduate School Curation Program (GSCP)* *Karachi, Sindh*

- Coordinated student progress and student-faculty interactions, including conducting discussion sessions, conducting workshops, mentoring EE/CE/CS students on their research, grading assignments, and creating lecture materials for the GSCP Research Seminar course.
- Developed and implemented algorithms for student-faculty matching and ranking, finalized mappings based on data analysis, and managed project documentation.
- Managed communications, including drafting emails, organizing faculty research seminars, compiling research project lists, and creating budget charts for GSCP activities.
- **Mentees:** Laiba Zehra, Raahim Hashmi, Bismaa Behlim, Hamad Abdul Razzaq, Hammad Bin Zahoor, Syed Asghar Abbas Zaidi

**Astera Software** **Jul. 2023 – Present**  
*Product Research and Documentation Executive, Product Strategist (EDI)* *Karachi, Sindh*

- Oversaw the entire Technical Demonstration Video production pipeline from conception to final product as a manager and leader.
- Spearheaded comprehensive product research and conducted competitor analysis to identify market trends and opportunities.
- Contributed to the Data Science and AI Research and Development team, working on low-code prototypes for AI and Data Science applications.
- Crafted detailed documentation encompassing textual, slide-based, and video formats to elucidate product features.
- Piloted initiatives in User Experience Design and played an instrumental role in designing prototypes for new product features.

**FortunaXR (www.fortunaxr.com)****Mar. 2023 – Present***Founder**Karachi, Sindh*

- Founded FortunaXR to develop VR training and education materials tailored for corporate professionals.

**Cloud Primero Pakistan Pvt Ltd.****Mar. 2023 – May. 2023***Corporate Innovation Intern**Karachi, Sindh*

- Worked with the Corporate Innovation Department, developing key innovative strategies and project initiatives.

**Texas A&M University****Aug. 2022 – Feb. 2024***Remote Visiting Student – HCIED Lab**Karachi, Sindh*

- Actively contributed to the lab's research, application development, and manuscript work.
- Advisor: Dr. Jeeun Kim, PhD Student: Nahyun Kwon

**Texas A&M University****Jun. 2022 – Jul. 2022***Research Intern – HCIED Lab**Karachi, Sindh*

- Conducted research for a project on Addressing Inaccessible Everyday Objects in Indoor Scenes by 3D Assistive Designs with Fine-grained Object Type Detection.
- Advisor: Dr. Jeeun Kim, PhD Student: Nahyun Kwon

**Habib University****Jan. 2022 – May. 2022***Peer Tutor – Electric Circuit Analysis**Karachi, Sindh*

- Assisted students in grasping the core concepts of Electric Circuit Analysis.

**EdAcumen****Jun. 2021 – Jan. 2022***Research Intern**Karachi, Sindh*

- Delved into research on 21st-century skills including Design Thinking, Problem Solving, and Critical Thinking.
- Played a key role in developing course outlines and resources for the 'Global Perspectives and Research' A Levels course.

**SkyEnd Digital****Nov. 2020 – Feb. 2021***Graphic Designer**Karachi, Sindh*

- Designed engaging advertisements aligned with product aesthetics and branding.

**SKILLS AND CERTIFICATIONS**

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**XR Development/Computer Graphics:** XR Development (Unity XR Interaction Toolkit, Meta XR Platform SDK, Unity AR Foundation, Vuforia, Unreal Engine, Blender 3D), C++ (SDL, Unreal Engine), C# (Unity 3D).

**HCI/Design:** UX Design, HCI Research - Qualitative and Quantitative Methods, Human Factors Research, Design Research & Design Thinking, Graphic Design, Figma, Adobe Illustrator, Adobe Photoshop.

**AI/ML/DL:** AI (ML, DL, Gen AI with a focus on GANs and LLMs), Python (NumPy, Scikit-learn, Pandas, Matplotlib, Tensorflow, Keras, PyTorch, Flask).

**Electrical and Hardware Design:** CAD Design (PTC Creo, SolidEdge), 3D Printing, PCB Design, Microcontroller Programming (C - Arduino, Python - Raspberry Pi), MATLAB (& Simulink), OrCAD PSpice, LabView.

**Miscellaneous:** SQL, C# (WPF, .NET), HTML, CSS, JavaScript, Markdown, Git, LaTeX, Video Editing (Adobe Premiere Pro), Technical Writing, Curriculum Development, Project Management, EDI (X12, HL7), Data Warehousing, Collaboration, and Teamwork.

**Relevant Certifications:** Google UX Design Professional Certificate, IBM Design Thinking Practitioner, XR For Everybody Specialization, Understanding Research Methods (UoL), Social and Behavioral Responsible Conduct of Research (CITI Program), Social-Behavioral-Educational Comprehensive (CITI Program), Computer Graphics with Modern OpenGL and C++, Deep Learning A-Z 2024.

## NOTABLE UNIVERSITY PROJECTS

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### Project War

- Developed a tower defense game using SDL/C++

### Autonomous Football Playing Robot

- Crafted a robot for a Microcontrollers course, focusing on the robot's mechanical design and module-specific coding.

### Arms and Legs

- Conceived a modular student chair, rooted in User Research, adaptable for home and university.

### Presidium

- Designed and developed a smart helmet paired with an app for post-accident alerts and driving analytics.

### Wind-Turbine Analog Dual Position Control System

- Designed an analog control system to manipulate the Pitch Axis and axial rotation of a Wind Turbine head. Crafted the system's mathematical model and worked on the physical prototype.

### Case Study on GMV Engine

- Undertook a case study on a GMV engine with a 1.1 Bore-Stroke Ratio, delving into its CAD design and kinematic analysis.

## TALKS AND WORKSHOPS

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Excel Workshop - *GSCP*

Developing VR-based Training Simulations for Emergency Fire Handling Services - *Texas Human-Computer Interaction Seminar*

Introduction to 3D Art and Blender 3D Workshop - *Habib University Mindstorm Chapter*

How to Ace the ECE Capstone Project? Workshop - *ECE*

Project Accessibility Lens - *Poster Presentation Texas A&M University (Habib University Research Abroad Program 2022)*

Introducing VAIFU: A Virtual Agent for Introducing and Familiarizing Users in VR - *IEEE iCoMET 2023*

LLM-Guided Speech Processing for 3D Human Motion Generation - *IEEE INMIC 2024*