Zaeem Mohtashim Khan

zaeemmohtashim@gmail.com | http://www.linkedin.com/in/zaeem-mohtashim-khan-893b7b243 |
https://portfolio-zaeem.vercel.app

My research interest is to bridge LLM-based reasoning with robust robotic control to create trustworthy, human-centered autonomous systems. I seek to design robots that can reason beyond pre-defined behaviors, dynamically interpret tasks, and make context-aware decisions in uncertain environments.

EDUCATION

Lahore University of Management Science | CGPA:3.88 *September 2022 - Present*
BSc (Hons.) Computer Science
Minor in Robotics
Relevant Courses: Mobile Robotics, Deep Learning, Topics in Large Language Models, Junior Design Studio - Robotics, Distributed Systems, Operating Systems, Data Structures, Algorithms, Network Centric Computing, Introduction to Blockchain.

Lahore Grammar School Johar Town *September 2020 - May 2022*
A-Level – 1A 3A*

Beaconhouse Garden Town Campus *September 2017- May 2020*
O-Level – 5A 4A 1B*

RESEARCH EXPERIENCE

Hybrid Bayesian-Deep Learning Framework for Intent-Aware Prosthetic Control *October 2025 – Present*
- Co-authored a research proposal to develop and simulate a novel hybrid framework for robust, intent-aware prosthetic arm control.
- Designing a modular pipeline that fuses a compact neural network (for sEMG intent classification) with a recursive Bayes filter to produce a stable, interpretable belief over user intent.
- Aiming to validate in a 3D simulation that this hybrid approach reduces spurious switches and improves early intent detection compared to pure neural-only baselines, using the public NinaPro dataset.

Protecting Young Users: Leveraging Multimodal Large Language Models for Enhanced Content Moderation on YouTube *November 2024 – Present*
- Co-authored a research paper investigating the application of Multimodal Large Language Models (LLMs) for robust content moderation on YouTube.
- Relabeled dataset of approximately 2500 ads according to YouTube's updated guidelines.
- Researched and analyzed the feasibility of using different LLMs to automatically detect and classify inappropriate content and advertisements targeted at children.
- Developed a novel pipeline to dynamically sample frames that resulted in a 21.4x cost improvement over inferring on the complete video while achieving 89% accuracy.

Mastani: A Multimodal Robotic Framework for Autonomous Object Retrieval *March 2025 – May 2025*
- Developed a novel robotic system on a DJI Robomaster platform, engineering a solution for autonomous object retrieval in cluttered indoor environments.
- Leveraged multimodal models (Gemini 2.0) to implement real-time, multilingual command interpretation, environment scanning, and dynamic obstacle avoidance.
- Designed and integrated the complete software stack, enabling the robot to autonomously identify, navigate to, and retrieve specified objects based on natural language commands.

Autonomous Trash Skimming Boat *March 2025 - June 2025*
- Co-developed an autonomous boat in a two-person team to address waterway pollution by identifying and collecting floating trash.
- Implemented computer vision models to enable real-time detection, classification, and collection of debris from water surfaces.
- Responsible for designing the autonomous navigation and control systems for the robotic vessel.
- Utilized a YOLO nano model, trained on diverse datasets, and deployed on an edge device to send commands to a Jetson Nano for controlling the boat's propulsion system.

Lumscape *January 2025 - June 2025*
- Collaborated in a 5-person team to develop "LUMScape," a 3D digital twin of the university campus using Unity.
- Engineered a user interface for virtual campus navigation and integrated a dynamic system to display current and upcoming university events.
- Developed the backend using Node.js and Express.js, implementing RESTful APIs and WebSocket connections to stream live data from university databases (MongoDB) for real-time event, eatery, and facility updates.
- Implemented core frontend features in the Unity WebGL client, including fast-travel navigation and data visualization, while applying LOD and texture management techniques to ensure a responsive, high-performance user experience.

PROFESSIONAL EXPERIENCE

LUMS – *Teacher's Assistant - Introduction to Blockchain* *September 2025 – Present*
- Assisted in designing and testing programming assignments for a class of 150 students.

- Conducted tutorials and weekly office hours (~4 hours/week) to explain core blockchain concepts, consensus algorithms, and smart contract development.
- Provided technical feedback on student projects, emphasizing code efficiency and secure transaction design.
- Ran plagiarism checks using Jplag for assignments and collaborated with the course staff to report plagiarism to relevant authorities.

Systems Limited – ***VSI Data Analytics Intern*** *June 2025 – July 2025*

- Designed and optimized SQL databases and queries using SSMS to support data-driven decision-making.
- Developed and automated ETL workflows using SSIS, improving data integration efficiency and pipeline reliability.
- Analyzed large datasets to identify performance bottlenecks and implemented data validation processes, gaining foundational experience in data management frameworks applicable to large-scale robotics data pipelines.

LUMS – ***Head Teacher's Assistant - Network Centric Computing*** *January 2025 – May 2025*

- Facilitated student comprehension for a class of 200+, clarifying complex web programming concepts through weekly tutorials and dedicated office hours.
- Assisted students in debugging and completing programming assignments, improving overall comprehension and project code quality.
- Ran plagiarism checks using Jplag for assignments and compiled reports for the instructors.
- Assisted in grading and checking of exams and quizzes.

LUMS – ***Head Teacher's Assistant - Fundamentals of Computer Science*** *September 2024 – December 2024*

- Collaborated with faculty to co-design assignments and lab modules for 300+ students, enhancing the practical application of Object-Oriented Programming (OOP) concepts.
- Mentored and guided the student cohort through complex topics, leading to improved project outcomes and a deeper understanding of fundamental computer science principles.
- Managed and coordinated a team of TAs to ensure consistent grading and support across all lab sections.

LUMS - Research Assistant with Dr Zartash Afzal *May 2024 - August 2024*

- Contributed to a four-person team under Dr. Zartash Afzal, tasked with redesigning the 'Fundamentals of Computer Science' curriculum.
- Won a grant worth PKR 500,000 to redesign course content according to new guidelines and introduce AI tools within the course.
- Analyzed existing course materials, benchmarked the curriculum against other top-tier programs, created new assignments, and proposed new module structures to improve student engagement.
- Developed and integrated an AI-powered chatbot to provide 24/7, scalable assistance to students for programming assignments and weekly labs, improving resource accessibility.

CO-CURRICULAR ACTIVITIES

Society for Promotion and Development of Science and Engineering - *Director Socials* *July 2024 – November 2024*

- Led the end-to-end planning and creation of all social events for the LUMS Science Symposium and LUMS PsiFi.
- Directed a team of 10+ members and orchestrated cross-departmental coordination, ensuring seamless logistical execution for all event components.

LUMS Animal Welfare Society - *Director Events* *September 2023 – May 2024*

- Conceptualized and directed a large-scale, university-wide Pet Show, developing the complete event framework, budget, and promotional strategy.
- Spearheaded all operational logistics, managing vendor contracts, venue booking, and cross-departmental coordination with university administration to ensure a successful, well-attended event.

LUMS Culinary Club - *Director Marketing* *September 2023 – May 2024*

- Managed the club's sponsor outreach, securing funding and brand partnerships for society events.
- Recruited and coordinated all food vendors for large-scale "Food Street" campus events

Orpheus Magazine – *Editor* *June 2021 – August 2023*

- Directed the design and media departments for Pakistan's first literary magazine, establishing the publication's visual brand and content layout strategy.
- Designed, developed, and launched the magazine's official website, enhancing its digital presence and expanding reader accessibility.
- Authored and edited several published short stories, contributing to the magazine's core literary content.

HONOURS & AWARD

- Dean's Honor List for 1st, 2nd, and 3rd Year - LUMS — September 2022 - Present
- Lums Learning Institute Design and Innovation Grant - 500,000PKR — June 2024
- Merit Scholarship 100% – Lahore Grammar School Johar Town — September 2020 - May 2022
- Science Society President - Beaconhouse Garden Town Campus — September 2019 - May 2020

Skills & Interests

Programming Languages: C| C++| Python| SQL| C#| Go| Solidity| Jawa| Jawascript
Software & Tools: Unity| ROS| Gazebo| PyTorch| TensorFlow| OpenCV| SSIS| SSMS| Git
Interests: Gaming | Robotics | Formula 1 | Football| Reading | Writing