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Education

Ghulam Ishaq Khan Institute of Engineering Sciences and Technology

Bachelor of Science in Computer Science

Topi, Pakistan

2022-2026

CGPA: 3.70 / 4.00

Relevant Coursework: Data Structures & Algorithms, Artificial Intelligence, Database Systems, Object-Oriented Programming, Operating Systems, DevOps, Numerical Computing, Discrete Maths, Linear Algebra, Probability & Statistics.

Experience

Mitacs Globalink Research Internship @ UWaterloo

Research Intern

Aug 2026 – Present

Waterloo, Canada

- Developed a modular, geospatial **multi-UAV simulation framework** in **Python** for evaluating drone path planning, autonomous navigation, and last-mile delivery operations in urban environments.
- Implemented graph-based path planning algorithms, including **A***, **Dijkstra**, and constrained shortest-path optimization, incorporating energy consumption, flight time, ground risk, and environmental constraints.
- Modeled real-world UAV operating conditions, including **wind dynamics**, battery consumption, navigation uncertainty, and obstacle avoidance, enabling simulation of realistic flight scenarios and online replanning.
- Integrated **OpenStreetMap** geospatial data and developed a real-time **Qt-based visualization** for simulating multi-drone traffic, evaluating flight trajectories, and conducting reproducible experiments.

MHTechFusion

Software Engineer

Nov 2025 – Present

Freiburg, Germany (Remote)

- Developed **computer vision applications** for object detection, motion prediction, license plate recognition, OCR, and demographic analysis using **YOLO**, **FaceNet**, and related models.
- Managed end-to-end **computer vision workflows**, including dataset collection, annotation, model selection, training, benchmarking, and integration into applications.
- Served as **Technical Lead** on software projects, coordinating development sprints, defining technical requirements, and overseeing implementation and delivery.

Dune AI

Software Engineer Intern

June 2025 – Aug 2025

Lahore, Pakistan

- Contributed to the development of a real-time **RoboCup SSL simulator** using **C++** and **OpenGL**, implementing a clean and hierarchical software architecture.
- Implemented software engineering practices, including automated builds with **CMake**, unit testing with **Google Test**, version control using **Git**, and cross-platform CI/CD with **GitHub Actions**.
- Developed robot path planning modules using **RRT**, **RRTX**, and **A***, optimizing navigation for smooth, obstacle-free trajectories at frequencies exceeding **40 Hz**.
- Developed a **Python Qt-based controller** using **ROS2** for manual robot control, simulation interaction, and testing.

Projects

REACH.AI | Python, FastAPI, PostgreSQL, Docker, OpenCV, AWS, Terraform, GitHub Actions

[GitHub](#)

Real-time Evaluation & Automation for Candidate Hiring with Artificial Intelligence

- Developed an end-to-end recruitment platform that unifies Applicant Tracking System (ATS), AI-driven video interviews, and technical assessments into a single pipeline.
- Developed a scalable **RESTful backend** using **FastAPI** and **PostgreSQL**, utilizing **Redis** for fast caching and optimizing endpoints to eliminate N+1 queries, ensured by comprehensive unit and integration tests.
- Built a **WebSocket-based** interview system featuring **native voice agents** for interactive Q&A, **vision models** for proctoring and real-time alerts, and a **Docker-sandboxed** environment for secure code execution.
- Implemented secure **JWT/OAuth 2.0** authentication and deployed infrastructure on **AWS** via **Terraform**, automating testing and deployment with a **GitHub Actions** CI/CD pipeline.

RoboCup SSL Simulator | C++, OpenGL, ROS2, CMake, Google Test

[GitHub](#)

- Contributed to the development of a real-time **RoboCup SSL simulator** using **C++** and **OpenGL** for dynamic visualization, utilizing **CMake** for builds, **Google Test** for validation, and **Git** for version control.
- Implemented and evaluated path planning algorithms (**RRT**, **RRTX**, **A***) to achieve smooth robot navigation paths at frequencies exceeding **40 Hz**.

- Developed a **Python Qt**-based controller for manual robot control and testing.

GKI Transport System | *Django, PostgreSQL, Azure Graph API, Tailwind CSS*

[Live Preview](#)

- Developed a centralized transport platform featuring seat reservations, real-time scheduling, and automated payment gateway integration to replace legacy paper workflows, reducing the ticket booking process to **under 2 minutes** by eliminating physical queues.
- Developed the **Django** backend with **PostgreSQL**, modeling complex institute-specific requirements for staff and students while utilizing **Microsoft Graph API** for automated email notifications.

Technical Skills

Languages: C, C++, Python, SQL (PostgreSQL), Bash

Frameworks & Libraries: FastAPI, Django, scikit-learn, Tensorflow, LangChain, OpenGL, OpenCV, NumPy, Pandas

Infrastructure & Tools: Git, Linux, Docker, AWS, Terraform, CMake, Redis, GitHub Actions

Concepts: RESTful APIs, Microservices, CI/CD, WebSocket, Data Structures & Algorithms, Object Oriented Programming