

Bilal Shah

Bachelor of Science
Computer Science
Ghulam Ishaq Khan Institute (GIKI)

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EDUCATION

B.S. - Computer Science

Sep 2022 - Jun 2026

Ghulam Ishaq Khan Institute (GIKI)

Artificial Intelligence, Data Structures, Software Engineering, Parallel and Distributed Computing, Database Systems

POSITIONS OF RESPONSIBILITY

• Team Member, Team Techno, GIKI

Dec 2023 - Dec 2024

- Designed and implemented obstacle avoidance and line-following algorithms for autonomous robots using Python and C++, improving navigation accuracy by 25%.
- Led marketing efforts, boosting team visibility by 30% at university tech fairs.

• Member, ACM Society, GIKI

Sep 2023 - Jan 2024

- Organized ICPC programming contest for 50+ participants, achieving 95% participant satisfaction.
- Conducted coding workshops on Python and algorithms, mentoring 20+ students and improving their problem-solving skills by 15%.

PROJECTS

Distributed Background Task Processing

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- Engineered a scalable job processing system with RESTful APIs, offloading tasks like email delivery and image processing, reducing app response time by 40%.
- Implemented Redis-backed queue and worker service, achieving 90% task completion under high load.
- Developed live metrics endpoint and logging, enhancing system monitoring by 20%.

CineMate

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- Developed a real-time social streaming web app with synchronized YouTube video playback and live chat, supporting 100+ concurrent users under 1s latency.
- Utilized React for dynamic UI and Firebase for authentication and real-time database management.
- Optimized frontend performance, reducing load times by 25% using lazy loading techniques.

LLM-Powered Issue Resolver

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- Built an AI assistant that resolves open-source project issues by retrieving relevant code context from Qdrant and generating solutions using Groq-hosted llama3.
- Integrated Ollama for local embeddings (nomic-embed-text), Express API for processing, React for frontend and firebase for hosting & authentication.

Parallel GNN

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- Accelerated Graph Neural Network operations using CUDA and MPI, achieving an 18.7× speedup on large-scale datasets.
- Reduced GPU memory overhead by 20% through optimized parallel processing.

Density-Based Clustering for Probabilistic Graphs

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- Implemented a C-based density-based clustering algorithm from the paper "Density-based clustering of big probabilistic graphs" by Zahid Halim and Jamal Hussain Khattak, supporting up to 1000 nodes with adjacency matrices.
- Optimized with degree-based seeding and a configurable threshold, enhancing cluster formation efficiency.

SKILLS

- **Programming Languages**: Python, C++, JavaScript, C, SQL
- **ML Libraries & Frameworks**: Pandas, Scikit-learn, XGBoost, nltk, Spacy
- **Web Frameworks**: FastAPI, React, Next.js
- **Databases**: PostgreSQL, Redis, Qdrant
- **System Programming & Tools**: CUDA, MPI, OpenMP, Python multiprocessing