HURAIRA KIYANI

PERSONAL DETAILS

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PROFILE

Systems engineer passionate about database internals, performance optimization, and infrastructure automation. Combines low-level PostgreSQL understanding (C extensions, memory management) with practical tool-building (observability suites, CLI automation). Currently exploring AI/ML integration with database systems. Seeking to contribute to scalable, observable data infrastructure.

EDUCATION

Bachelor of Science in Software Engineering (BSSE) 2022 - Present
Virtual University of Pakistan, Pakistan

- Relevant coursework: Data Structures & Algorithms, Database Systems, Object-Oriented Programming, Software Architecture, Operating Systems
- Currently prioritizing hands-on database systems engineering experience

EMPLOYMENT

Software Engineering Intern – Database Systems May 2025 - Oct 2025
SKAI Worldwide, Remote

- AgensAI Extension Development: Implementing AI model support within PostgreSQL, focusing on embedding/inference patterns and extension lifecycle management
- Cross-Ecosystem Driver Migration: Adapted Apache AGE's NetworkX integration for AgensGraph, modifying query translation logic to maintain functionality across different graph database implementations
- Database Tooling Analysis: Reverse-engineered pgAdmin4 architecture to understand large-scale database management system design patterns and extension points
- Infrastructure Automation: Containerized complete PostgreSQL+AgensGraph+Apache AGE development environments using Docker, reducing setup time from hours to minutes

SKILLS

PostgreSQL Extension Development

PostgreSQL SPI

Query Optimization

AgensGraph

Apache AGE

Python

Cypher

Linux Systems

CI/CD Concepts

Git workflow

Testing

Performance Analysis

Database Observability

Learning Methodology

C

SQL

Docker Containerization

Performance Monitoring

Systems Programming C++

Documentation

Modular design

Systems Debugging

Extension Architecture

TECHNICAL PROJECTS

PostgreSQL Extension Development
Developed experimental extensions using PostgreSQL's Server Programming Interface

- Focused on safe memory handling patterns and the extension lifecycle within PostgreSQL's process model
- Demonstrates: Systems-level programming, understanding of PostgreSQL internals, safe C practices

Database Performance Observability Suite
Built a modular toolkit for PostgreSQL performance analysis

- Query profiler leveraging pg_stat_statements for bottleneck identification
- Metrics collector for database and OS-level monitoring
- Automated insight generation for performance anomaly detection
- Designed with CLI-first architecture for automation and integration into monitoring pipelines
- Demonstrates: Production-minded tooling, understanding of database performance characteristics, automation mindset

Graph Database Ecosystem Exploration
Configured and experimented with AgensGraph + Apache AGE stack

- Modified driver-level code to improve compatibility between different graph database implementations
- Demonstrates: Ability to navigate complex database ecosystems, practical graph database experience

PROFESSIONAL DEVELOPMENT

Intensive Database Engineering Focus 2024
Self-directed study of PostgreSQL internals, extension development, and database infrastructure

- Applied knowledge through structured internship at SKAI Worldwide (May 2025 – October 2025)
- Complemented by Software Engineering coursework at Virtual University of Pakistan

Continuous Learning
Ongoing study of advanced database topics

- PostgreSQL query planner internals and optimization techniques
- Database extension security models and best practices
- Observability patterns for distributed data systems
- Vector databases and AI/ML integration with traditional RDBMS