Abhinav Bajpai

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SUMMARY

Software Engineer with MS in Computer Science and 4+ years specializing in database infrastructure and backend API development. Expert in PostgreSQL optimization, database architecture, and Python FastAPI development. Proven track record managing database infrastructure for 400K+ users, reducing response times from 8 seconds to under 2 seconds through primary-replica architecture, query optimization, and table partitioning. Strong experience with database monitoring systems, zero-downtime migrations, and building RESTful APIs achieving 85 percent cost reduction through intelligent caching.

EDUCATION

Master of Science in Computer Science | Syracuse University, Syracuse, NY — Aug 2023 - May 2025
Bachelor of Technology in Computer Science and Engineering | REVA University, India — Jul 2015 - Jun 2019

TECHNICAL SKILLS

Languages: Python, JavaScript, TypeScript, SQL, Shell Scripting
Backend: FastAPI, Node.js (Fastify)
Databases: PostgreSQL (primary-replica, partitioning, VACUUM), MySQL, Redis, Neo4j, pgvector
Cloud: AWS (Lambda, EC2, RDS, S3, CloudWatch), Azure (Functions, Event Hubs, Logic Apps)
DevOps: Docker, Git
Tools: Pydantic, AST parsing, SHA256 hashing, Elasticsearch

EXPERIENCE

Software Engineer Intern | Syracuse University, Remote (Seattle, WA) — Jul 2024 - Present

- Architected codebase analysis platform using Python FastAPI reducing external API costs by 85 percent through intelligent caching strategy, processing 50-file codebases in under 500ms with 99.5 percent cache hit rate saving approximately USD 2,000 monthly
- Built automated code intelligence system using AST parsing to extract structural patterns from Python repositories, achieving 100 percent test coverage across 1,130 lines of production code with zero production incidents

Software Developer Intern | Meltek Inc., Remote — May 2024 - Aug 2024

- Engineered real-time data pipeline using Azure Event Hubs capturing over 50,000 utility data points daily from Con Edison APIs, processing energy consumption and demand response metrics for climate tech platform
- Ensured 99.9 percent data integrity for SOC 2 compliance across distributed cloud infrastructure by implementing automated data quality checks and validation rules for financial transactions
- Developed serverless validation layer using Python and Azure Functions for financial auditability of monthly payouts exceeding USD 50,000, reducing manual audit preparation time by 60 percent through automated reconciliation
- Migrated legacy polling services to event-driven Serverless Azure Logic Apps architecture, optimizing infrastructure costs by 45 percent while improving response times by 30 percent through asynchronous processing
- Built monitoring dashboards tracking pipeline health, data sync latency, and error rates, enabling proactive issue detection and resolution before impacting downstream financial reporting systems

Software Developer | Tata Consultancy Services, Bangalore, India — May 2019 - Jul 2023

- Managed PostgreSQL database infrastructure for 400,000+ employees, reducing database load by 40 percent and improving system response times from 8 seconds to under 2 seconds through primary-replica architecture and query optimization
- Supported Elasticsearch search integration by isolating indexing workload to dedicated database servers, maintaining real-time data synchronization under 5 seconds while preventing performance degradation on primary database
- Enabled zero-downtime system updates through expand-contract migration patterns and implemented table partitioning by date improving query speed by 80 percent, supporting 24/7 operations with 99.9 percent uptime
- Built database monitoring and alerting system tracking query performance, connection pool utilization, and replication lag, reducing mean time to detection for performance issues from hours to minutes through proactive alerts
- Optimized database storage through automated VACUUM operations and index rebuilding, reducing database bloat by 35 percent and reclaiming 200GB storage space while maintaining system availability

PROJECTS

Healthcare Knowledge Graph Chatbot | github.com/Abhinav-SU/Hospital-chatbot

- Built intelligent chatbot for medical query processing, enabling users to search and explore healthcare data across hospitals, patients, physicians, and insurance providers through natural language queries and relationship-based navigation

TaskWeave - AI Conversation Management Platform | github.com/Abhinav-SU/task-weave

- Developed conversation management platform enabling users to organize, search, and migrate conversations across multiple AI assistants (ChatGPT, Claude, Gemini), solving the problem of scattered conversation history with semantic search and real-time synchronization