

# Sai Arvind Krishnan

## Software Engineer

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### SUMMARY

Backend-focused software engineer with hands-on experience building production systems in Java and Python, spanning SQL-heavy data modeling, transactional backends, batch processing, and retrieval-augmented systems. Proven ability to optimize system performance and cost (latency, token usage, query efficiency) and to design correctness-driven workflows for real-world domains including telecom billing audits, inventory intelligence, and ML-backed platforms. Experienced with RAG pipelines, vector search (FAISS/Chroma), cloud and on-prem deployments, and end-to-end ownership from backend architecture to APIs and debugging in production.

### SKILLS

**Languages:** Java, Python, C++, JavaScript, TypeScript, C#, SQL

**Full-Stack & APIs:** Node.js, Express.js, ASP.NET Core, REST, GraphQL, MVC, API Design, HTML, CSS, React, Angular, Responsive Design, State Management

**AI, Data & Cloud:** Artificial Intelligence (AI), RAG, LLM APIs, Vector Search, Embeddings, MySQL, PostgreSQL, MongoDB, SQL Server, Vector DBs (FAISS, Chroma), AWS (EC2, S3, RDS, IAM), Azure (App Services, Functions), Docker, CI/CD

**Systems & Tools:** DSA, OOP, OS Basics, HTTP/HTTPS, TCP/IP, Authentication, Git, Testing, Debugging, Logging, Agile

### EXPERIENCE

#### SetuCS.io, Dallas TX (Remote)

Aug 2025 - Current

##### Software Engineering Intern

- Reduced **Gemini RAG** inference by consolidating multiple LLM calls into a single request, batching vector retrieval results, and parsing structured responses, reducing P95 latency by **35%** and token usage by **40%** in **Node.js/Express** using **Axios** and **ChromaDB**.
- Re-architected relational **SQL schema** to **3NF** using **FK constraints**, **composite indexes**, **indexed joins**, **query plan optimization**, transaction-safe migrations, improving referential integrity, **ACID guarantees**, and multi-tenant query performance by **25%**.
- Deployed and operated the platform on **Azure VMs** behind a **NAT Gateway**, integrating **Azure Monitor** for logs and metrics and diagnosing production issues across VM-hosted services, improving mean time to detection by **40%**.
- Implemented **JWT authentication** and **Casbin-based RBAC** to control API access by role and policy, enforce **tenant isolation** and least-privilege permissions, reducing authorization-related defects by **30%**.
- Delivered a performant **React** and **TypeScript** frontend using **Vite**, **Tailwind**, **shadcn/ui**, **React Router**, and **TanStack Query**, integrating **RAG** and **ML** endpoints and improving dashboard load times by **30%**.

#### TEOCO Corporation, Tempe AZ

Jan 2026 – Current

##### Software Engineer (Capstone)

- Built Python-based PDF ingestion and extraction pipelines using **pdfplumber / PyMuPDF**, structuring telecom billing invoices for enterprise clients (AT&T, Verizon) into **normalized PostgreSQL schemas** for audit and analysis.
- Implemented Python validation and audit workflows performing **cross-document field matching**, **numeric consistency checks**, and **overcharge detection** across **carrier billing**, **usage**, and **contract data**, emitting **traceable audit outputs**.
- Added an optional RAG layer **by** chunking extracted text, generating embeddings, and indexing with FAISS, **enabling** semantic retrieval, evidence lookup, and human-in-the-loop reprocessing **via** Python APIs.

#### Inox Tools Ltd., Chennai India

May 2023 – Dec 2023

##### Software Engineering Intern

- Replaced spreadsheet-based vendor and inventory tracking by building an on-prem **Java 17 / Spring Boot** backend, modeling vendors, SKUs, purchase orders, goods receipts, returns, and inventory ledgers using **PostgreSQL + Spring Data JPA**.
- Avoided paid **SaaS** and external **OpenAPI** dependencies due to cost constraints, and implemented internal **REST APIs (Spring Web)** to expose **vendor KPIs**, inventory state, and procurement data directly from **relational tables**.
- Automated recurring operational workflows by implementing **scheduled batch jobs (Spring Scheduler)** to compute vendor performance metrics, inventory summaries, and exception reports, reducing manual reconciliation effort by **40%** weekly.
- Fixed correctness issues in live inventory updates by introducing **ledger-based inventory transactions**, idempotent update logic, and Transactional boundaries, **preventing double-counting during** PO receipts and returns.
- Improved backend reliability and maintainability using **Bean Validation**, **centralized exception handling**, structured logging (**SLF4J/Logback**), and audit tables, enabling **debugging and traceability** in a small, on-prem environment.

#### Vellore Institute of Technology, Chennai India

Dec 2023 - May 2024

##### Research Intern

- Built an end-to-end Music Information Retrieval (MIR) and remix pipeline in **Python 3**, using **librosa**, **NumPy**, **scikit-learn**, **SoundFile**, **argparse**, and **setuptools** for modular audio ML + CLI workflows.
- Implemented audio feature engineering with **MFCC**, **Chroma STFT (Chromagram)**, beat-synchronous segmentation, statistical pooling (mean/std), and vector fusion to create fixed-length audio embeddings for similarity search.
- Implemented pairwise similarity scoring using **cosine similarity**, **Euclidean distance (L2 distance)**, and embedding-space retrieval via **k-Nearest Neighbors (kNN) / NearestNeighbors** from **scikit-learn**.
- Designed and trained a deep-learning **RNN similarity model** (pairwise sequence input, 0-1 Similarity Index output) using **TensorFlow /Keras** or **PyTorch**, enabling learned semantic similarity beyond handcrafted DSP metrics.
- Productionized the research prototype with **PyTest unit testing**, **pickle-based artifact pipelines** (mapping.pkl, dataset.pkl, nearestneighbour.pkl), and reusable CLI commands for audio preprocessing, feature extraction, model fitting, and remix generation.

### EDUCATION

#### Master of Science in Software Engineering

Aug 2024 – May 2026

Arizona State University, Ira A. Fulton Schools of Engineering, USA

- Appointed Technical Lead – ASU LX Design for technical excellence and Leadership

#### Bachelor of Technology in Computer Science and Engineering

Aug 2020 – May 2024

Vellore Institute of Technology, India

- Hackathon Finalist Nominee – VIT Institute-Level Event