

Harsh Jitendrakumar Rao

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Summary

Software engineer with a growing foundation in algorithms, data pipelines, ML experimentation, exploring AI and agentic workflows through hands-on learning and system building.

Education

Santa Clara University

Master's of Science, Computer Science - GPA 3.85/4.0

Santa Clara, CA
September 2024 – June 2026

Indian Institute of Information Technology

Bachelor's of Science, Computer Science - GPA 4.0/4.0

India
September 2020 – July 2024

Experience

Research Assistant

Santa Clara University

Santa Clara, CA
September 2025 – Present

- Built Airflow-based ETL pipelines using AWS Glue, introducing schema validation, retries, and backfills, reducing pipeline failures, coordination overhead, and recovery time.
- Built data preprocessing and aggregation pipelines to produce model-ready features and expose inference results via dashboards.
- Prototyped a RAG system using vector embeddings and document chunking to query internal sales performance data.

Software Developer Intern

Creotosaurus

India
January 2024 – July 2024

- Developed an AI-powered AR app using YOLOv8 Unity with ARKit/ARCore to overlay murals in real time.
- Trained YOLOv8 on 15k images for 28% higher precision; integrated Stable Diffusion via AWS Bedrock for mural generation.
- Migrated an ETL Alteryx workflow to a Python AWS Lambda pipeline using Redshift as data warehouse, saving \$8,000/year in licenses.

Student Researcher

Indian Institute of Information Technology

India
July 2023 – January 2024

- Parallelised training of Graph Attention Networks (GATs) for molecular diffusion modelling, achieving a ~4% improvement in prediction accuracy over a single-threaded baseline on a fixed validation set.
- Optimised GNN training throughput on NVIDIA HGX GPUs using CUDA by parallelising tensor operations and minimising memory transfers, reducing end-to-end training time from ~48 hours to ~40 hours.

Software Engineering Intern

JIO

India
April 2023 – July 2023

- Integrated Apache Kafka with the Jenkins Logstash plugin to stream ~10K daily build logs into Elasticsearch via Logstash, enabling centralized, real-time log search and visualization in Kibana.
- Developed a Python-based resource rebalancer daemon that adjusts VM resources for Jenkins nodes.
- Built a Flask-based internal service to monitor ~5,000 Jenkins nodes, manage VM quotas, and exposed operational metrics visualised through Grafana dashboards.

Projects

Pull Request Shield (Automated ML-based security analysis for pull requests)

- Built an automated PR analysis pipeline to flag potential security issues, reducing manual review effort for internal repositories.
- Fine-Tuned CodeBERT on 6 million lines of code to detect security risks like SQL injection, Hardcoded Secrets/API Keys and XSS.
- Integrated an LLM-based code suggestion via AWS Bedrock and the GitHub API to generate suggestions for flagged pull requests.

Loan Broker (Fault-tolerant Loan Broker system with end-to-end observability)

- Architected a distributed microservices system using AWS, .NET, Docker, and Enterprise Integration Patterns.
- Instrumented microservices with OpenTelemetry to collect distributed traces and visualise end-to-end request latency across services.
- Implemented retry and error-handling mechanisms using ServicePulse to monitor message failures and diagnose processing bottlenecks.
- Deployed containerised infrastructure with Kubernetes and LocalStack; configured Grafana and Prometheus dashboards.

Technical Skills

- Skills:** Artificial Intelligence, Cloud Computing, Data Analysis, Data Science, Machine Learning
- Programming Languages:** Python, Java, C/C++, C#, JavaScript, SQL, TypeScript
- Technologies:** .NET, Apache Spark, AWS, Flutter, Kubernetes, Linux, MongoDB, Node.js, PostgreSQL

Achievements

- Competitive Programming:** Top 0.2% LeetCode, Codeforces Master
- Kaggle:** Ranked 10 in the Stanford RNA Competition, Ranked 19 in the Aneurysm Detection Competition