

Aruthra Sathish Kumar

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Fairfax, Virginia

Skills

Languages: Python, Java, TypeScript, SQL

Frameworks: React, Node.js, Express.js, Django, Fast API, Design patterns, SDLC

Cloud & DevOps: AWS(Lambda, EC2, ECS, S3, API Gateway, RDS, DynamoDB, IAM), Microsoft Azure, Cloud-native & Microservices, fault-tolerant distributed systems, Docker, Kubernetes

Tools & Practices: Git, Linux, CI/CD, RESTful APIs, GraphQL, Apache Kafka, Agile, Jira, GenAI-assisted development, FAISS/RAG

Databases: MySQL, PostgreSQL, MongoDB, Redis

Work Experience

George Mason University

Graduate Teaching Assistant

Aug 2025 - Present
Fairfax, Virginia

- Mentored **100+ students** in backend engineering and distributed Node.js systems (HTTP servers, routing, async patterns, REST, event-driven workflows), resulting in a **20%** increase in overall lab completion.
- Trained students to design **secure, scalable SQL-backend services** using schema normalization, indexing strategies, query tuning, and prepared statements, lowering SQL-related failures by **30%**.
- Led advanced debugging sessions replicating **production-grade distributed pipelines** in Codio; taught diagnosis of multi-step request flows, concurrency issues, state propagation, and data-flow defects.
- Partnered with faculty to refine **backend lab architecture**, streamline grading workflows, and **enhance runtime environments** improving **reliability**, consistency, and overall student performance.

Verzeo edutech Pvt.Ltd

Software Engineer Intern

Aug 2023 - Jul 2024
Banglore, India

- Developed and deployed **full-stack** features for Verzeo's e-learning platform, integrating **React.js** front-end with **Python/Django** back-end, enabling **1K+** students to seamlessly access courses, assignments, and assessments.
- Applied **OOP** principles to refactor services into small, testable and reusable Python modules, accelerating feature rollout by **30%** and reducing bugs by **25%**.
- Implemented a **REST API** layer in **Django** with purpose-built endpoints to compose course and progress data; reducing **client API** calls by **40%** and improving page render time by **25%**.
- Designed and optimized **relational database schemas** for courses, users, and attempts, reducing heavy query time **30-45%** and scaled reliably to **5K+** records.
- Collaborated with team members during **peak-traffic**, to standardize cursor pagination and server-side joins in the **REST** layer and streamline **React.js** data requests; minimizing **database round-trips** by **60%** and cut dashboard render time by **25%**.

Projects

USDA Rural Development Website Chatbot

React, FastAPI, PostgreSQL, FAISS

- Built a **RAG platform (React + FastAPI)**, indexing **200+** docs with **MinILM embeddings** and **FAISS (hybrid dense/BM25 search)**.
- Engineered secure auth using **Google OAuth2 + JWT**, and persisted chat history in **PostgreSQL (JSONB)** with session linking.
- Integrated **Ollama (Mistral)** with **cross-encoder re-ranking**, improving response relevance by **40%** with real-time local inference.

Academic Performance Analytics System

PyTorch, Scikit-learn, Pandas, NumPy

- Built a **CNN-GRU model** for programming activity data, combining **spatial and temporal features** to enhance classification accuracy.
- Engineered temporal features from raw Codio logs, achieving **89%** accuracy and outperforming SVMs and Random Forests.
- Deployed real-time prediction pipeline processing **2K+** records, achieving **67%** faster interventions through automated alerts.

Anonymous Multi-Language Voice Q&A Platform

React, Node.js, Socket.io, MongoDB

- Built a real-time voice-enabled Q&A system using **Whisper transcription** and translation APIs across **50+** languages for accessibility.
- Engineered scalable **WebSocket** infrastructure supporting **500+** concurrent users with **<100ms** updates and synchronized voting.
- Designed **MongoDB** schemas with **TTL** indexing and moderation workflows enabling room management and automated cleanup.

Education

George Mason University

Master of Science in Information Systems

Fairfax, Virginia
Aug 2024 - May 2026

Anna University

Bachelor of Technology in Information Technology

India

Aug 2020 - May 2024

Certifications

- Microsoft Certified: Azure Fundamentals