

Aruthra Sathish Kumar

[LinkedIn](#) | [GitHub](#) | [Portfolio](#)

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Fairfax, Virginia

Skills

Languages: Python, Java, TypeScript, SQL

Frameworks: React, Node.js, Express.js, Django, Fast API, REST API Design, Microservices

Cloud & DevOps: AWS, Microsoft Azure, Docker, Kubernetes, CI/CD

Tools & Practices: Git, Linux, Apache Kafka, Distributed Systems, Fault-Tolerant Architecture, High Availability Architecture, Real-Time Data Pipelines, Query Optimization, Monitoring & Observability

Databases: MySQL, PostgreSQL, MongoDB, Redis

AI / ML: AI Agents & Multi-Agent Systems, Generative AI, Scikit-learn, PyTorch, Predictive Analytics, Feature Engineering, Statistical Modeling, Forecasting & Anomaly Detection, ML Pipelines, Model Evaluation, RAG, Vector Databases, Model Inference Optimization

Work Experience

George Mason University

Aug 2025 - Present

Fairfax, Virginia

Graduate Teaching Assistant

- Guided over **100** students in backend engineering and distributed **Node.js** systems (HTTP servers, routing, async workflows, **REST**), enhanced technical proficiency and contributed to a **20%** increase in overall lab completion rates across the semester.
- Instructed students to design secure, **fault-tolerant SQL-backend** services using schema normalization, indexing strategies, query tuning, and prepared statement, cutting SQL failures by **30%** and strengthening implementation of scalable service patterns.
- Conducted weekly **coding** workshops focused on **RESTful API design** and backend issue resolution, decreased average **debugging** time by **20%** while enabling students to ship **production-ready**, fault-tolerant backend features.
- Performed **exploratory data analysis** on student activity logs, engineering high-signal temporal features that improved predictive model stability, reduced noise by **18%** and helped instructors identify at-risk students earlier in the semester.
- Authored **documentation** for backend lab frameworks, covering API specifications, data models, error-resolution workflows, and performance guidelines, reduced student support requests by **35%** and standardized project development across all sections.

Verzeo Edutech Pvt.Ltd

Aug 2023 - Jul 2024

Banglore, India

Software Engineer Intern

- Engineered and shipped **full-stack features** for Verzeo's e-learning platform using **React, Django, and REST APIs**, supported **1K+** students to seamlessly access course content, assignments, assessments, and personalized dashboards across devices.
- Leveraged **OOP** principles to refactor backend services into modular, testable Python components, improved code maintainability, cut defect rates by **25%**, and accelerated feature delivery cycles by **30%** across the platform.
- Reengineered **REST API** data access layers using **Django** REST Framework, minimized redundant **API calls** by **40%** and elevated client-side render speeds by **25%**, and promoted overall platform responsiveness and user engagement metrics.
- Architected and normalized **relational database schemas** for courses, users, and assessment attempts, lowered heavy query latency by **35%** and ensured reliable scaling of transactional data as student enrollment surpassed **5,000** active platform users.
- Integrated server-side joins, cursor-based **pagination**, and refined query planning in **high-traffic** course APIs, eliminated dashboard render time by **25%** and slashed database round-trips by **60%** during **peak** learning hours.

Projects

USDA Rural Development Website Chatbot

React, FastAPI, PostgreSQL, FAISS

- Developed a **RAG** chatbot indexing **100+ USDA** documents using MiniLM sentence **embeddings** and **FAISS-BM25** hybrid retrieval.
- Incorporated local **Ollama Mistral** with cross-encoder re-ranking, increased relevance scores by **40%** for rural-information queries.

Academic Performance Analytics System

PyTorch, Scikit-learn, Pandas, NumPy

- Trained a **CNN-GRU** model on student activity traces, achieved **10%** higher classification accuracy than traditional ML baselines.
- Extracted temporal and behavioral features from Codio logs reached **89%** accuracy, outperformed SVM, Random Forest models.

Anonymous Multi-Language Voice Q&A Platform

React, Node.js, Socket.io, MongoDB

- Built a multilingual voice Q&A platform using **Whisper** for real-time transcription and translation, handled **1,500+** audio streams.
- Architected scalable **WebSocket** channels supporting **25+** simultaneous voice rooms with synchronized updates **<100ms** latency.

Education

George Mason University

Fairfax, Virginia

Master of Science in Information Systems (GPA: 3.95)

Expected May 2026

Anna University

India

Bachelor of Technology in Information Technology (GPA: 3.60)

Aug 2020 - May 2024

Certifications

- Microsoft Certified: Azure Fundamentals