

Aruthra Sathish Kumar

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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
Graduate Teaching Assistant Fairfax, Virginia

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

Verzeo Edutech Pvt.Ltd Dec 2022 - Feb 2023
Software Engineer Intern Bangalore, India

- Engineered and shipped **full-stack features** for Verzeo’s e-learning platform using **React**, **Django**, and **REST APIs**, supporting **1K+** students to seamlessly access course content, assignments, assessments, and personalized dashboards.
- Resolved critical student login failures by optimizing **OAuth2** token validation, refining session handling, and integrating **OpenAthens SSO**, reducing **authentication-related tickets** by **45%** and restoring platform reliability during peak usage.
- Reengineered **REST API** data access layers using **Django** REST Framework, minimizing redundant **API calls** by **40%** and elevating client-side render speeds by **25%**, and promoting overall platform responsiveness and user engagement metrics.
- Architected and normalized **relational database schemas** for courses, users, and assessment attempts, lowering heavy query latency by **35%** and ensuring 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, eliminating dashboard render time by **25%** and slashing 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, increasing 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, achieving **10%** higher classification accuracy than traditional ML baselines.
• Extracted temporal and behavioral features from Codio logs, reaching **89%** accuracy, outperforming SVM and Random Forest models.

Anonymous Multi-Language Voice Q&A Platform React, Node.js, Socket.io, MongoDB
• Orchestrated a multilingual voice Q&A platform using **OpenAI Whisper** for real-time transcription, handling **1,500+** audio streams.
• Architected scalable **WebSocket** channels supporting **25+** simultaneous voice rooms with synchronized updates at **<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