Gokul Kaarthick Shanmugam

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Education

Indiana University Bloomington   August 2024 - May 2026
Master of Science in Computer Science   *Bloomington, United States*
Coursework : Applied Machine Learning, Software Engineering, Applied Algorithms, Native Mobile App Development, Data Visualization, Systems & Protocol Security & Information Assurance

Sri Krishna College of Engineering and Technology   August 2017 - May 2021
Bachelor of Technology in Information Technology   *Coimbatore, India*
Coursework : Distributed Systems, Operating Systems, Data Structures & Algorithms

Experience

Athenahealth   September 2022 - July 2024
Senior Software Engineer   *Chennai, India*

- Migrated workloads to a Kubernetes cluster on EC2 to reduce infrastructure costs & improve scalability, achieving a 60% cost reduction ($200K savings annually).
- Implemented event-driven microservices by integrating AWS Lambda with Kafka & OpenSearch for real-time logging, improving efficiency & enabling processing of over 50,000 events/minute.
- Mentored and trained 6 developers in an agile engineering team, reducing onboarding time & enhancing team collaboration.
- Secured 2nd place in the 2023 hackathon by developing a VMware VSCode extension that automated SRE CI/CD workflows, improving deployment efficiency.

Athenahealth   July 2021 - August 2022
Software Engineer   *Remote*

- Engineered token bucket rate limiting using Redis to protect high-traffic API routes from DDoS attacks and designed a redirect wait page with JavaScript and jQuery, minimizing downtime by 95%.
- Designed a distributed task queue using RabbitMQ and Node.js to optimize API workload distribution, accelerating high-volume request execution by 200ms per request.
- Led the migration from Elasticsearch to OpenSearch, enhancing global logging and search performance while improving indexing efficiency and lowering query latency by 40%.
- Implemented a bucket-brigade exploit filter to mitigate the Log4j vulnerability (CVE-2021-44228), blocking 50K+ exploit requests and earning 2022 Company Hall of Fame recognition.

Athenahealth   January 2021 - June 2021
Software Engineer Intern   *Remote*

- Developed a React-based dashboard for REST API monitoring to resolve delays in retrieving critical system metrics, minimizing access time by 45%.
- Built an AMQP message queue to handle 10M+ daily requests, optimizing HL7 FHIR data flow, reducing latency by 35% and improving throughput for healthcare transactions.
- Optimized DynamoDB query indexing in asynchronous APIs, eliminating 60% of redundant queries and improving product response efficiency.

Skills

Technologies: Java, Python, TypeScript, Node.js, Linux, Redis, Helm, Terraform, SQL, Git

Cloud & DevOps: Kubernetes, Kafka, RabbitMQ, Docker, Ansible, Prometheus, Jenkins, Amazon Web Services (AWS)

ML Tools: PyTorch, TensorFlow, Pandas, Matplotlib, NumPy

Projects

Emergency Response Multi AI Agent System   April 2025

- Built a multi-agent AI assistant for real-time emergency response using autonomous agents and LLM, enabling contextual responses across public safety domains.
- Deployed a Flask-based dashboard and simulation interface with real-time APIs, enabling voice interactions, alerts and handling 6+ emergency scenarios.
- **Technologies:** Flask, Twilio, OpenCV, OpenWeatherMap API, Ollama, HTML/CSS