Viresh Duvvuri

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Backend Software Engineer with 5+ years building production REST APIs, CI/CD pipelines, and scalable cloud infrastructure. Experienced in developing full-stack applications from requirements to production deployment, with expertise in Python, JavaScript, Docker, and AWS. Strong collaborator who works effectively across engineering teams to deliver reliable backend services with monitoring and observability. Built and maintained production systems serving 200+ daily users with focus on performance, reliability, and operational excellence.

Skills

Programming & Backend: Python, JavaScript, TypeScript, C++, SQL, FastAPI, Flask, React, REST APIs, API Design, NumPy, Pandas, OOP

Cloud & DevOps: AWS, Azure, Docker, CI/CD, Kubernetes, NGINX, Deployment, DevOps, Monitoring, Observability, Performance Tuning, Scalability

Data & Integration: Data Processing, Data Integration, Enterprise Integrations, Enterprise Systems, Data Science, Knowledge Graph

AI/ML (Additional Expertise): Agentic AI, LangChain, LangGraph, Multi-Agent Systems, MCP (Model Context Protocol), RAG, Prompt Engineering, Model Evaluation, MLOps, GenAI, FAISS, Pinecone, Vector Search, PyTorch, TensorFlow, Scikit-learn

Work Experience

Grid CoOperator — Seattle, WA
AI Engineer — *Mar 2025 - Present*

- Led design and deployment of domain-specific agentic AI agents for smart grid analytics, collaborating cross-functionally with business stakeholders to translate operational requirements into multi-agent systems using LangChain orchestration and prompt engineering strategies that reduced analyst workflows by 70% within 2 months through rapid iteration
- Architected AI orchestration system where specialized agents communicate and coordinate for complex analytics tasks, deployed on AWS with observability and cost monitoring, established model evaluation pipelines tracking quality metrics, latency, and performance to achieve reliable enterprise performance within 6 weeks across 50-100 daily queries
- Deployed production AI system to cloud infrastructure with CI/CD pipelines, monitoring, and performance optimization, accelerating deliverables by 60% within first quarter through rapid experimentation, iterative prompt engineering, and continuous improvement

Freefly Systems — Woodinville, WA
Senior Software Engineer — *Nov 2021 - Oct 2025*

- Developed comprehensive diagnostic and analysis tools for engineering teams, independently designed and built AI-powered diagnostic tool using Python and modern LLM frameworks from requirements to production, improving customer self-service capabilities and team response times by 40%
- Built automated systems to process complex technical data and identify system failures, developing knowledge base enhancements and support tools that streamlined operations
- Contributed to drone platform codebases implementing new features and optimizations for flight control systems and payload integration across multiple product lines, managed software integration projects from planning through release
- Led release management for drone platforms overseeing testing phases from alpha through production deployment, coordinating firmware updates and executing comprehensive testing protocols with cross-functional teams

Lumenier — Sarasota, FL
Drone Software Developer — *Jul 2020 - Oct 2021*

- Wrote embedded code in C++ to integrate LiDAR and optical flow sensors for obstacle avoidance and position holding with/without GPS under various lighting conditions
- Collaborated with open-source flight control software maintainers for integration, testing, and deployment of autonomous flight algorithms, prototyped innovative features like toss-to-launch for product roadmap development

York Exponential — York, PA
Software Engineer - R&D — *Aug 2018 - May 2020*

- Developed prototype software for in-house autonomous surveillance mobile robots using ROS2, SLAM, and computer vision technologies
- Built Human Machine Interface for Universal Robot welding applications using Python and Kivy framework, implemented multi-robot control systems with platform independence

Education

Washington State University — Pullman, WA
Master of Science Computer Science — *Jan 2015 - Jan 2017*

GITAM University — Visakhapatnam, India
Bachelor of Technology Information Technology — *Jan 2011 - Jan 2015*

Projects

Production System Optimization Tool

- Problem: Manual system analysis taking hours of expert time, creating bottlenecks in product development and customer support resolution
- Solution: Built full-stack application with React frontend, Python Flask backend, integrated foundation model APIs (Ollama and Llama 3.2) for real-time log processing and interactive analysis using prompt engineering and model evaluation
- Impact: Transformed expert analysis from hours to minutes, deployed to production serving 200+ daily queries with significant performance improvements through rapid iteration and continuous optimization

GridCOP: Smart Grid Analytics Platform

- Problem: Power grid analysts needed automated database querying and intelligent insights to understand complex data patterns beyond basic visualizations
- Solution: Developed backend platform using FastAPI with multi-agent system architecture, implemented RESTful APIs for data querying, integrated vector search (FAISS) for intelligent data retrieval, deployed on AWS with observability, monitoring, and logging infrastructure
- Impact: Enhanced analyst productivity by 70% through automated workflows, built robust CI/CD pipelines for continuous deployment, implemented comprehensive error handling and testing for production-ready system serving 50-100 daily queries

Embedded Flight Control Systems

- Problem: Autonomous drone systems required real-time flight control with sensor integration and reliable performance in varied conditions
- Solution: Developed embedded C++ software for PX4 flight controller integrating LiDAR and optical flow sensors, implemented obstacle avoidance and position control algorithms, collaborated with open-source maintainers for testing and deployment
- Impact: Delivered production-ready autonomous flight capabilities, demonstrated strong systems engineering skills with real-time constraints, performance optimization, and cross-team collaboration