Viresh Duvvuri

Portfolio: https://viresh-duvvuri.netlify.app/ linkedin.com/in/viresh-duvvuri vireshduvvuri@gmail.com
+1-509-964-5469 Seattle, WA, USA

Professional Summary

AI Engineer with 5+ years at fast-paced startups building production systems from embedded robotics to agentic AI applications. Specialized in multi-agent architectures, RAG, and MCP-based integrations. Background spans hardware systems to modern LLM agents with focus on production-ready, cloud-deployed solutions

Professional Experience

AI Engineer, *Grid CoOperator* 07/2025 – Present
Seattle. WA

- Deployed GridCOP agentic system using Langchain, MCP, Python, and SQL databases to automate data research and contextual analysis for smart grid operations
- Reduced analyst research time by 70% by automating SQL query generation and online context gathering, eliminating manual database querying and web searches required to understand RECOVER tool visualizations
- Accelerated stakeholder reporting by 60% through automated report generation that transforms analytical insights into comprehensive reports, replacing manual documentation workflows

Software & Systems Engineer - Drones & AI, *Freefly Systems* 11/2021 – Present
Woodenville, WA

- Deployed AI-powered drone log analysis tool using React, Python Flask, Ollama, and Llama 3.2 with real-time ULog processing and interactive chat interface for flight data insights
- Achieved 80% reduction in manual log review workflows by automating drone crash analysis across 11+ health categories while leading cross-team diagnostic system development and issue tracking
- Integrated flight control systems and payloads across Altax and Astro (drone) platforms with comprehensive testing to ensure operational reliability
- Led cross-functional development of diagnostic systems from requirements through production deployment, coordinating across engineering, manufacturing, and customer support teams

Drone Software Developer, *Lumenier* 07/2020 – 10/2021
Sarasota, FL

- Implemented custom PX4 flight modes including Toss-to-Launch and room surveillance systems using MAVLink and UAVCAN protocols for specialized drone applications
- Enhanced flight capabilities in GPS-denied environments by integrating LiDAR sensors and optical flow for 360° obstacle avoidance and position hold across different lighting conditions
- Architected robust test procedures to validate firmware with each release, ensuring GPS, GPS-denied position-hold, and obstacle avoidance functionality across different lighting and operational conditions

Software Engineer - R&D, *York Exponential* 08/2018 – 05/2020
York, PA

- Created Human Machine Interface for collaborative welding using Kivy framework and ROS2 (Robot Operating System), reducing operator programming complexity by 50%
- Architected autonomous surveillance robot prototype using Python, ROS2, and computer vision - from requirements to prototype

Skills

Agentic AI & LLMs
LangChain, LangGraph, MCP, RAG, Multi-Agent Systems, Agent Orchestration, Context Management, VectorDB, Ollama, TensorFlow, Prompt Engineering, A/B testing, Agent observability & tracing, Streaming architectures, LLMops

Infrastructure & Cloud
AWS, Docker, Linux, Git, Distributed systems, CI/CD, Cloud deployment, Microservices

Programming & Development
Python, C++, React, Flask, Streamlit, SQL, Pandas, NumPy, Pytest, OOP, Multithreading, Websockets, Async Programming

Robotics & Embedded Systems
PX4, ROS/ROS2, RTOS (Nuttx, Zephyr), MAVLink, I2C, UART, SPI, CAN, Simulation (Gazebo, ReRun), SITL/HITL testing

Education

Master of Science, Computer Science, *Washington State University* 2015 – 2017
Pullman, WA,USA

Bachelor Of Technology, Information Technology, *GITAM University* 2011 – 2015
Visakhapatnam, India

Projects (For demo visit: https://viresh-duvvuri.netlify.app/)

AI-Powered Drone Log Analysis Tool (Org: Freefly Systems. Domain: AI Agents),
Real-time ULog processing with interactive AI chat - Transforms drone debugging from hours to minutes

- Problem Solved: Manual drone crash analysis taking hours of expert time, delaying product development and customer support resolution
- Implementation: Deployed React frontend, Python Flask backend, Ollama, and Llama 3.2 for real-time ULog processing with automated health checks across 11+ systems and interactive chat interface
- Achievement & Learning: Transformed expert analysis from hours to minutes, mastered local AI model deployment and discovered importance of domain-specific AI training for technical analysis

GridCOP: Smart Grid Analytics Agent (Org: Grid CoOperator. Domain:AI Agents),
Agentic AI system for smart grid data analysis and operator decision support

- Problem Solved: Power grid analysts needed autonomous database querying and contextual insights to understand complex smart grid data patterns beyond basic visualizations
- Implementation: Production system using Langchain framework with intelligent SQL database querying, dual validation system, and context-aware response generation for utility data analysis
- Achievement & Learning: Enhanced analyst productivity by 70% through automated research workflows, gained expertise in production-ready agentic systems with robust error handling

AI Travel Planner Agent (Org: Personal, Domain: AI Agents),
Conversational AI travel agent - AI-powered itinerary generation with real-time travel information

- Problem Solved: Manual travel planning requiring hours of research across multiple sources with inconsistent and outdated information
- Implementation: Built with Anthropic's Claude 3.5 Sonnet, LangChain, Streamlit, and DuckDuckGo Search API for personalized itinerary generation with conversational refinement
- Achievement & Learning: Enabled personalized travel experiences through interactive planning, learned conversational AI interface patterns and real-time data integration techniques

Advanced Flight Control Systems (Org: Lumenier, Domain: Robotics),
Custom modes & sensor integration - Enhanced flight capabilities in challenging environments

- Problem Solved: Need for precise autonomous payload delivery system with controlled descent mechanisms for logistics and emergency applications
- Implementation: Designed coaxial copter with advanced C++ navigation algorithms, drop-and-recovery functionality, and autonomous target location programming using PX4 flight control
- Achievement & Learning: Established research foundation for autonomous delivery systems, gained deep understanding of robotics system design and autonomous decision-making algorithms

Human Machine Interface for Collaborative Welding (Org: York Exponential, Domain: Robotics),
Multi-Robot Control System focusing on platform independence

- Problem Solved: Complex robot programming interfaces requiring extensive training for welding operators and need for scalable multi-robot control architecture
- Implementation: Developed HMI using Python, Kivy framework, and ROS2 for Universal Robot integration with simplified programming interface and platform-independent control system
- Achievement & Learning: Reduced operator programming complexity by 50%, learned importance of user-centered design in industrial robotics and platform-agnostic system architecture

Certificates

Agentic AI System Architectures and Design Patterns
Advanced course covering agentic AI system design patterns, architecture principles, and implementation strategies for building intelligent autonomous systems

Coding Essentials for Agents
Specialized programming course focusing on coding practices and patterns essential for developing AI agents and autonomous systems

Building a Multi-Agent System for Software Engineering and Testing
Hands-on project-based course focused on developing multi-agent systems for software engineering workflows, including automated testing and development processes

Supervised Machine Learning: Regression and Classification
Comprehensive machine learning course covering supervised learning algorithms, regression analysis, and classification techniques using Python, NumPy, and scikit-learn

RAG Systems Essentials
Comprehensive course covering Retrieval-Augmented Generation (RAG) systems, including vector databases, embedding techniques, and advanced retrieval strategies