Vivek Chary

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SUMMARY

Senior Embedded Firmware Engineer with 6+ years of progressive experience in designing, developing, and optimizing firmware for connected IoT devices, drones, security systems, and industrial remote controls. Proven expertise in embedded Linux (kernel space and BSP customization), low-level driver development, real-time systems, and hardware-software integration for imaging pipelines, wireless communication (RF, cellular, BLE, WiFi), and power-efficient architectures. Passionate about bridging firmware with hardware to deliver robust, customer-centric products in surveillance and remote monitoring. Seeking to contribute architecture-level insights and hands-on validation to VOSKERs solar-powered, LTE-connected smart cameras.

EXPERIENCE

Senior Firmware Engineer Industrial Remote Controls, Cattron Global *Oct 2025 - Present*

- Lead firmware architecture and development for RF-based industrial remote control systems, focusing on real-time wireless protocols, low-power optimization, and safety-critical features for material handling and remote operations.
- Designed and integrated low-level drivers (SPI, I2C, UART, GPIO) and communication stacks for multi-microcontroller platforms (Master/Slave/Radio), enabling reliable over-the-air firmware updates and configuration management.
- Performed hardware validation on prototypes, debugging performance in lab environments using oscilloscopes, signal analyzers, and JTAG tools to ensure robust operation under industrial conditions.
- Collaborated with cross-functional teams (hardware, product, and safety) to evaluate new component integration and optimize firmware for enhanced user experience and system reliability.
- Contributed to customized embedded Linux builds and containerized workflows (Docker) for scalable firmware deployment across product lines.

Firmware Developer, Communication Subsystems, Mannarino Systems & Software *Jan 2022 - Oct 2025*

- Developed and optimized embedded software in C/C++ for Prime Air drone vehicle management and communication subsystems using Linux-based stacks, real-time operating systems, and safety-critical architectures (ARINC 653).
- Designed and implemented Ethernet, CAN Bus, and Network Interface Card drivers, along with communication protocols for processor families including QorIQ and ST32, ensuring seamless low-level hardware-software interactions.
- Worked in Agile CI/CT environments with Lauterbach debugging tools to support continuous integration, board bring-up, and real-time performance tuning for autonomous drone operations.
- Contributed to architecture reviews, defining interfaces between firmware, DSP accelerators, and on-chip peripherals to support scalable drone platforms.
- Delivered firmware updates and diagnostic tools that enhanced system stability and communication reliability in complex aerial environments.

Firmware Developer , IoT Security Devices, SYNQ Access Security and Technology *Oct 2018 - Dec 2021*

- Designed, developed, and tested firmware in C (bare-metal and RTOS) for ESP32, PSoC6, Raspberry Pi, and ARM-based platforms used in EAS gates, retail media devices, and high-level IoT security systems.
- Built video pipelining, camera interface, and SerDes integration modules, including microcontroller bootloaders, upgrade mechanisms, and diagnostic functionality for real-time imaging and capture systems.
- Integrated wireless protocols (BLE, WiFi, LoRaWAN) and messaging frameworks (MQTT, XMPP, HTTP) with device drivers for peripherals (SPI, I2C, UART, GPIO), enabling secure, connected IoT solutions.
- Performed initial board bring-up, lab validation with signal generators/oscilloscopes, and Agile development using Git, Docker containers, and version control for rapid iteration on connected products.
- Optimized firmware for performance and power efficiency, directly impacting device reliability in security and surveillance applications.

PROJECTS

Prime Air Drone Communication & Vehicle Management Firmware Platform

- Architected and implemented Linux-based communication stack with Ethernet, CAN Bus, and NIC drivers on QorIQ/ST32 processors, enabling real-time data exchange between vehicle management subsystems and ground stations.
- Developed low-level interfaces for DSP accelerators and on-chip peripherals, including ARINC 653-compliant safety-critical modules, resulting in improved system stability and reduced latency in autonomous flight operations.
- Led hardware validation and performance optimization using Lauterbach tools, supporting continuous integration pipelines and successful integration of new sensor modules.

SYNQ IoT Smart Surveillance Camera Firmware Integration

- Designed and optimized end-to-end video pipelining firmware for ESP32/PSoC6 platforms, including camera interface, SerDes integration, and real-time image capture/processing for retail security and EAS gate systems.
- Integrated wireless protocols (WiFi, BLE, LoRaWAN) with MQTT/HTTP messaging and peripheral drivers (SPI/I2C/UART/GI enabling secure, low-power cellular-connected device operation with OTA updates and diagnostic capabilities.
- Performed full board bring-up, lab debugging with oscilloscopes/signal analyzers, and firmware optimization that enhanced power efficiency and video reliability in deployed IoT surveillance products.

EDUCATION

Master of Engineering, Electrical and Comupter Engineering *Sep 2018 - May 2020*
Concordia University

SKILLS

Programming & Frameworks:: C, C++, Python, Flask, Django
Embedded Platforms:: Embedded Linux (kernel space, drivers, BSP customization), FreeRTOS, bare-metal, Yocto/custom Linux distributions
Processors & Peripherals:: ARM Cortex, STM32, ESP32, QorIQ, ST32, PSoC6, Raspberry Pi, Jetson Nano, FPGAs
Cloud & DevOps:: AWS (EC2, S3), CI/CD (Jenkins), Docker, Kubernetes, Git
Protocols & Interfaces:: SPI, I2C, UART, GPIO, Ethernet, CAN Bus, BLE, WiFi, LoRaWAN, MQTT, HTTP, RF wireless, Cellular (LTE-equivalent stacks)
Imaging & Systems:: Video pipelining, camera/SerDes integration, image sensors/capture systems, real-time OS, memory management, bootloaders
Tools & Methodologies:: Lauterbach, Arm Keil, STM32Cube, Espressif IDF, Visual Studio Code, Cypress, Git, Docker, JIRA, Agile/Scrum, CI/CT, oscilloscopes, signal analyzers Other: Unit & automation testing, MySQL, Shell scripting, Postman

Additional Info

- I am Canadian Citizen and does not require Visa Sponsorship.