

# RICHARD LOURETTE

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**Principal Embedded Systems Architect | IoT Platform Leader | Technical Innovation Leader**

✉ rlourette@gmail.com | 📞 585.953.5309 | 📍 Fairport, New York | Remote Ready

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## PRINCIPAL EMBEDDED SYSTEMS ARCHITECT SUMMARY

Visionary Embedded Systems Architect with 30+ years designing robust, scalable architectures for mission-critical systems across medical devices, IoT platforms, and safety-critical applications. Expert in end-to-end system architecture, hardware-software integration, and wireless connectivity solutions. Proven track record transforming complex requirements into production-ready embedded platforms that scale from proof-of-concept to millions of deployed devices.

### Core Architecture Expertise:

- **System Architecture Design:** 30+ years architecting embedded systems from bare-metal to full Linux platforms
  - **Medical & Healthcare IoT:** Clinical blood analyzers, wearable biometric devices, remote monitoring systems
  - **Wireless Protocol Architecture:** BLE, Wi-Fi, Proprietary UHF, LoRa, NFC implementations for connected ecosystems
  - **Hardware-Software Integration:** ARM Cortex processors, board bring-up, system-level debugging
  - **Performance Optimization:** Power-efficient designs for battery-operated devices, real-time constraints
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## PROFESSIONAL EXPERIENCE

**RL TECH SOLUTIONS LLC** | Rochester, NY

**President & CTO | Embedded Systems Architecture Consultant** (Oct 2022 - Present)

Leading embedded systems architecture consulting for cutting-edge technology companies, specializing in scalable IoT platforms and connected device ecosystems.

### Key Architecture Achievements:

- Architected next-generation Linux-based embedded platforms supporting multiple wireless protocols (Wi-Fi, BLE)
- Designed modular system architectures enabling rapid product development and feature expansion
- Established embedded development best practices including coding standards, testing frameworks, and CI/CD pipelines
- Led architecture reviews ensuring compliance with industry standards and regulatory requirements

### **D3 Engineering/L3Harris Aerospace - Chief Engineer Consultant** (Oct 2022 - Dec 2023)

- **Spacecraft Payload Architecture:** Architected complex spacecraft payload systems integrating 5 radiation-hardened MCUs via SpaceWire/SpaceFibre communication for distributed high-performance embedded computing applications
- **High-Performance Embedded Computing:** Designed heterogeneous CPU/FPGA computing architectures running NASA Core Flight System (cFS) framework on RTEMs RTOS for onboard processing
- **CCSDS C&DH Systems:** Implemented CCSDS Command & Data Handling protocols and high-speed downlink architectures for spacecraft payload data processing
- **Software Architecture:** Implemented microservices architecture with fault-tolerant design principles for enhanced reliability and maintainability in space environments
- **Requirements Analysis:** Decomposed high-level satellite system requirements into detailed hardware, software, and firmware specifications
- **Radiation Hardening:** Implemented error correction codes, redundancy schemes, and radiation mitigation techniques for space-qualified embedded systems
- **Business Impact:** Contributed to winning \$50M+ aerospace contract through technical architecture presentation and system design including multi-Terrabyte data recorder architecture for mission data management

### **Topcon Positioning Systems - Lead Architect** (Oct 2023 - Present)

- Architected major subsystems for next-generation GNSS receivers on embedded ARM platforms
- Designed scalable software architecture delivering 150,000+ lines of production C++ code
- Implemented comprehensive testing frameworks reducing deployment issues by 40%
- Mentored team on embedded Linux best practices and modern C++ development

## **PANASONIC CORPORATION**

### **Engineering Group Manager - Industrial IoT Division** (Jan 2020 - Oct 2022)

Led cross-functional teams developing connected IoT platforms for industrial and commercial applications, managing embedded firmware, RF engineering, and protocol design teams.

**IoT Platform Architecture:**

- Architected scalable IoT gateway platform supporting BLE, Wi-Fi, and HaLow protocols
- Designed edge computing architecture supporting real-time data processing and analytics
- Established wireless connectivity standards across product lines

**TOKENIZE INC. / CASE WALLET** | New York, NY**VP Engineering - Wearable Technology** (Apr 2014 - Jan 2020)

Led engineering teams developing ultra-low-power embedded systems for biometric wearable devices with focus on battery life optimization and secure wireless connectivity.

**Wearable IoT Leadership:**

- Directed development of power-efficient embedded systems achieving 5-day battery life in compact form factor
- Led teams implementing BLE and NFC communication protocols for secure payment transactions
- Managed FreeRTOS-based firmware development on ARM Cortex-M processors
- Oversaw hardware-software co-design for optimal system performance
- Guided security architecture implementation for PCI-compliant payment systems

**L3HARRIS CORPORATION** | Rochester, NY**Chief Scientist / Principal Investigator** (May 2002 - Sep 2015)

Architected complex embedded systems for aerospace and defense applications, including spacecraft payload processors and safety-critical systems.

**Mission-Critical Systems Architecture:**

- Designed radiation-hardened embedded architectures for spacecraft applications
- Architected multi-processor systems using SpaceWire communication protocols
- Led system-level integration of hardware and software components
- Established fault-tolerant design patterns for high-reliability systems
- Mentored junior engineers on embedded systems best practices

**EASTMAN KODAK COMPANY** | Rochester, NY

**Chief Firmware Architect** (Aug 1994 - May 2002)

Led international firmware development teams creating embedded systems for consumer electronics and imaging devices.

**Consumer Electronics Leadership:**

- Architected firmware for digital cameras and imaging systems
  - Led transition to ARM-based embedded platforms
  - Managed global firmware teams across multiple product lines
  - Established modular architecture supporting product variants
  - Drove adoption of modern embedded development practices
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## TECHNICAL SKILLS

### Programming Languages & Tools

- **Languages:** C/C++ (30+ years), Python, JavaScript, Java, HTML/CSS, Forth, Assembly (ARM, x86)
- **Build Systems:** CMake, Make, Yocto, Buildroot
- **Version Control:** Git, GitHub, GitLab
- **Testing:** Google Test, Unity, Hardware-in-the-Loop testing

### Embedded Operating Systems

- **Embedded RT Linux:** Embedded Linux kernel configuration, device drivers, BSP development
- **RTOS:** FreeRTOS, RTEMs, Nucleus RTOS, bare-metal programming
- **Development:** Cross-compilation, remote debugging, JTAG/SWD

### Hardware Platforms & Processors

- **Microcontrollers:** ARM Cortex-M/A series, TI MSP430, STM32
- **SoCs:** NXP i.MX, TI Sitara, Broadcom
- **Interfaces:** I2C, SPI, UART, USB, Ethernet

### Wireless Technologies & IoT

- **Protocols:** Bluetooth Low Energy (BLE), Ethernet, Wi-Fi, NFC
- **IoT Platforms:** MQTT, CoAP, RESTful APIs
- **Edge Computing:** Local data processing, sensor fusion
- **Security:** TLS/SSL, secure boot

## System Architecture & Design

- **Architecture Patterns:** Layered architecture, event-driven systems, pub-sub
- **Performance:** Power optimization, real-time constraints, memory management
- **Documentation:** System specifications, architectural diagrams, API design

## Development Methodologies

- **Agile/Scrum:** Sprint planning, backlog management, continuous integration
- **Code Reviews:** Design reviews, peer programming, best practices enforcement
- **Mentoring:** Technical leadership, knowledge transfer, team development

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# RELEVANT PROJECTS & ACHIEVEMENTS

## Distributed Satellite Systems Architecture

- Architected distributed satellite payload processing system based on NASA CFS (Core Flight System) middleware
- Designed fault-tolerant architecture enabling real-time payload data processing across multiple spacecraft nodes
- Implemented modular software architecture supporting mission-specific payload configurations

## Heterogeneous Computing Platform Architecture

- Created distributed heterogeneous architectures integrating CPUs and FPGAs for airborne and space platforms
- Designed high-performance data processing pipelines leveraging FPGA acceleration for signal processing
- Architected system-level integration enabling seamless CPU-FPGA communication and workload distribution

## Object-Oriented Embedded Framework

- Created comprehensive OO software framework for Kodak Digital Cameras product line

- Designed reusable component architecture supporting multiple camera models from single codebase
  - Established design patterns enabling rapid feature development and product variants
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## PATENTS & PUBLICATIONS

- 20+ US Patents in embedded systems, signal processing, and IoT architectures
  - Published articles on modern C++ for embedded systems and functional safety
  - White paper: "C++26 Reflection - Revolutionizing Memory-Constrained Embedded Systems"
  - Technical article: "Functional Safety Standards Hierarchy for ProfiSafe Implementation"
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## EDUCATION

### **Bachelor of Science in Electrical Engineering**

University of Dayton | Dayton, Ohio

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## LEADERSHIP PHILOSOPHY

I believe embedded systems architects must balance technical excellence with practical delivery. My approach combines hands-on technical leadership with strategic platform thinking, ensuring systems not only meet today's requirements but scale for tomorrow's challenges. I'm passionate about creating reliable, maintainable architectures that empower development teams to innovate rapidly while maintaining the highest standards for safety and reliability.

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## CLEARANCE

Previously held DoD Top Secret clearance with SSBI for SCI access (available for reinstatement)

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## PROFESSIONAL CREDENTIALS

**FCC Amateur Extra Class License Holder (AB2MD)** - Highest level amateur radio license demonstrating advanced RF and electronics expertise