# RICHARD LOURETTE

**Principal Firmware Engineer | IoT Systems & Algorithms Specialist**

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## PROFESSIONAL SUMMARY

Principal Firmware Engineer with 30+ years of experience developing embedded systems and IoT solutions for battery-powered, resource-constrained devices. Technical leader specializing in C/C++ firmware architecture, wireless communication protocols, and low-power embedded system optimization. Proven track record defining technical roadmaps for scalable IoT platforms, mentoring engineering teams, and delivering complex projects under tight deadlines. Deep expertise in system architecture, sensor integration, real-time data processing, cloud connectivity, and firmware optimization strategies for ultra-low power consumption.

**Core Competencies:** Firmware Architecture | Technical Leadership | IoT Systems Design | Embedded C/C++ | Low-Power System Optimization | Wireless Protocol Implementation | Real-Time Systems | Sensor Integration | Team Mentorship | Hardware Debugging

## TECHNICAL EXPERTISE

**Programming Languages:** C/C++ (30+ years), Python, Assembly Language
**Embedded Platforms:** ARM Cortex-M/A, TI MSP430, STM32, Low-Power SoC Platforms
**Operating Systems:** FreeRTOS (15+ years), Embedded Linux, RTEMs RTOS, Bare Metal Programming
**Wireless Protocols:** Wi-Fi, BLE, Zigbee, NFC, MQTT, CoAP, TCP/UDP, LoRa
**Development Tools:** GCC Toolchain, JTAG Debuggers, Oscilloscopes, Logic Analyzers, Protocol Analyzers, Spectrum Analyzers
**IoT Platforms:** Cloud Service Integration, RESTful APIs, Data Ingestion and Analysis, Edge Processing
**Testing Frameworks:** Unit Testing, Hardware-in-the-Loop (HIL), Automated Testing, Performance Validation
**Machine Learning:** Algorithm Optimization for Embedded Systems, Edge Processing Architectures

## PROFESSIONAL EXPERIENCE

RL TECH SOLUTIONS LLC | President & Chief Technology Officer

**October 2022 – Present | Rochester, NY**

**Topcon Positioning Systems – Principal Embedded Software Consultant**

*October 2023 – April 2025*

- **Firmware Architecture:** Architected and directed development of high-performance Linux C++ subsystems for battery-powered GNSS receivers using ARM A9 TI processors
- **Performance Leadership:** Led optimization initiatives achieving 40% performance improvement through systematic profiling and memory optimization strategies for resource-constrained embedded devices
- **Real-Time System Design:** Designed and implemented multi-threaded application architectures optimized for real-time data processing and transmission in low-power environments
- **Quality Assurance:** Established comprehensive testing frameworks and delivered 150,000+ lines of production C++ code with extensive test coverage using Python and automated testing methodologies
- **Technical Innovation:** Created custom monitoring applications and debugging tools for real-time thread CPU utilization analysis, establishing new development standards

## PANASONIC INDUSTRIAL IOT DIVISION | Engineering Group Manager

**February 2021 – October 2022 | Rochester, NY**

- **IoT Platform Architecture:** Led technical architecture and cross-functional teams developing connected IoT gateway products with integrated wireless protocols including Wi-Fi, BLE, and proprietary mesh networking
- **Technical Leadership:** Provided technical direction to RF engineering teams implementing diverse wireless communication protocols for industrial IoT applications
- **Cloud Integration Strategy:** Directed architectural decisions for RESTful interfaces enabling enterprise system integration and cloud service connectivity
- **Critical Problem Resolution:** Led technical investigation and resolution of critical RF communication protocol issues for 2000+ device customer deployment in resource-constrained environments
- **Process Innovation Leadership:** Championed transformation of testing processes from manual to fully automated frameworks, achieving 10x reduction in test cycle time
- **Team Development:** Managed and mentored engineering teams spanning firmware, RF engineering, QA, and hardware design disciplines
- **Strategic Planning:** Defined and implemented embedded systems technology roadmap for next-generation industrial IoT product portfolio

## TOKENIZE INC. | Vice President of Engineering

**September 2015 – February 2021 | Rochester, NY**

- **Ultra-Low Power Architecture:** Led R&D architecture and technical strategy for biometric wearable devices with strict battery life requirements, implementing innovative power management strategies
- **Advanced Sensor Systems:** Architected and directed development of real-time signal processing algorithms for capacitive fingerprint scanning and biometric sensor systems
- **Wireless Technology Integration:** Led integration of BLE and NFC technologies for wearable device connectivity and secure data transmission
- **Algorithm Innovation:** Created and optimized real-time signal processing algorithms and data visualization tools for sensor data analysis
- **Cross-Functional Leadership:** Provided technical leadership and collaborated with hardware teams on power optimization and sensor interface design for battery-operated devices
- **System Validation Leadership:** Directed hardware bring-up activities and established validation methodologies using embedded test software, oscilloscopes, logic analyzers, and spectrum analyzers
- **Performance Engineering:** Led firmware optimization initiatives for real-time performance while meeting strict power consumption constraints

## L3HARRIS GEOSPATIAL SYSTEMS | Principal Investigator/Chief Scientist

**May 2002 – September 2015 | Rochester, NY**

- **Embedded Algorithm Development:** Developed advanced signal processing algorithms using Python and C++ for real-time embedded systems
- **High-Performance Computing:** Led development of distributed embedded computing systems with real-time data processing requirements
- **System Architecture:** Designed embedded electronics for sensor platforms with strict power and performance constraints
- **Communication Protocols:** Implemented various communication interfaces including Ethernet, serial protocols, and custom data transmission systems
- **Team Leadership:** Mentored junior engineers and coordinated multi-disciplinary engineering teams on complex embedded projects
- **Performance Analysis:** Conducted system-level testing and validation with focus on real-time performance metrics and optimization

## EASTMAN KODAK COMPANY | Chief Firmware Architect

**1995 – 2002 | Rochester, NY**

- **Embedded Firmware Development:** Led international firmware development teams for consumer electronic devices with embedded wireless capabilities
- **Low-Power Optimization:** Designed firmware for memory-constrained embedded systems with strict power consumption requirements
- **Communication Protocols:** Implemented USB device drivers and wireless communication protocols (Bluetooth) for consumer devices
- **Real-Time Processing:** Developed real-time image processing algorithms and calibration systems for embedded applications
- **Framework Development:** Created object-oriented firmware frameworks supporting multiple product lines from single architecture

- **Cross-Platform Development:** Managed distributed teams across multiple countries developing embedded solutions

# KEY ACHIEVEMENTS

## IoT Systems & Firmware Development

- **Performance Optimization:** Achieved 40% performance improvements in embedded systems through systematic profiling and optimization
- **Process Innovation:** Reduced testing cycles from weeks to days through automated testing framework implementation
- **IoT Platform Success:** Led development of industrial IoT gateway supporting 2000+ device deployment
- **Ultra-Low Power Design:** Successfully designed wearable devices meeting strict battery life requirements

## Technical Leadership & Innovation

- **Team Leadership:** Successfully led and mentored 13+ engineers across firmware, hardware, RF, and QA disciplines
- **Architecture Innovation:** Designed scalable firmware architectures and established development standards for embedded systems
- **Technology Integration:** Led implementation of advanced sensor integration and wireless communication protocols in embedded systems
- **Code Quality Standards:** Established quality frameworks resulting in 150,000+ lines of production C++ code with comprehensive testing coverage
- **Patent Portfolio:** 20+ issued US patents in embedded systems, signal processing, and IoT technologies

## Strategic Leadership & Project Management

- **Global Team Leadership:** Directed distributed teams across multiple continents with successful delivery of complex embedded projects
- **Technical Strategy:** Led cross-functional coordination and engineering support throughout product lifecycle from concept to production
- **Process Innovation:** Established Agile/Scrum methodologies and development standards for embedded development teams
- **Customer Success:** Provided technical leadership for critical issue resolution in large-scale deployments under tight time constraints

# EDUCATION

**Bachelor of Science in Electrical Engineering**

University of Dayton | Dayton, Ohio

# ADDITIONAL QUALIFICATIONS

- **IoT Technical Leadership:** 10+ years leading IoT systems development, sensor integration, and wireless protocol implementation

- **Low-Power Architecture:** Extensive experience architecting battery-operated devices and power optimization strategies
- **Algorithm Development:** Experience with signal processing algorithms and embedded system optimization architectures
- **Debugging & Validation:** Expert-level proficiency with oscilloscopes, logic analyzers, protocol analyzers, and embedded debugging methodologies
- **Communication Protocols:** Deep architectural knowledge of Wi-Fi, BLE, MQTT, TCP/UDP, and IoT-specific protocols
- **Development Process Leadership:** Established automated testing pipelines and continuous integration workflows
- **Technical Mentorship:** 15+ years mentoring engineering teams and establishing development best practices
- **Remote Collaboration:** 5+ years of successful remote technical leadership with distributed engineering teams
- **Security Architecture:** Knowledge of IoT security best practices and secure communication protocol implementation