

Thomas Ruch

Principal Software Engineer

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PROFESSIONAL SUMMARY

Principal Software Engineer with over 20 years of experience in embedded systems, high-performance distributed platforms, and data-intensive applications. Proven success delivering FDA-regulated medical software, designing scalable SaaS solutions, and optimizing complex data pipelines. Skilled in C/C++ and RTOS-based systems, with additional experience developing full-stack and data-driven platforms using Go, React, TypeScript, and SQL. Experienced bridging embedded systems engineering, cloud-native architectures, and analytics workflows. Seeking Principal or Staff-level roles in embedded systems, systems software, or performance-critical backend platforms, with an emphasis on architecture, reliability, scalability, and advanced data processing.

SKILLS

Languages: C, C++, Python, SQL, Go, Bash, Perl

Frameworks & Tools: Qt, React, Docker, Squish, Git

Systems & Domains: Embedded Systems, Device Drivers, BSP, Distributed Systems, TCP/IP, Machine Vision, Security

Databases & Data: MySQL, Redis, PostgreSQL, Informix, Microsoft SQL Server

Practices: Performance Optimization, Debugging, Profiling, Unit Testing

Platforms: ARM Cortex-M/A, STM32, QNX, Linux, FreeBSD, OpenBSD, Solaris, Windows

EDUCATION

University of Pittsburgh - Pittsburgh, PA

Master of Science in Data Science, GPA: 4.0, Expected Graduation: Dec 2027

Ohio University - Athens, OH

Completed all **Master of Science** coursework in **Computer Science**, GPA: 3.459

Ohio University - Athens, OH

Bachelor of Science in Telecommunications, Minor in Computer Science, cum laude

PROFESSIONAL EXPERIENCE

Philips, via APN - R&D Embedded Software Engineer, Contract

June 2026 - Present

Next-generation FDA-regulated medical device | C++ | STM32U5 | ARM Cortex-M33

- Design and implement low-level C++ drivers for STM32U5 systems, defining reusable interfaces for new hardware components.
- Developed and integrated a C++ driver for the TUSB320 USB Type-C controller, including initialization, status monitoring, platform configuration, and hardware validation.
- Developed and integrated a C++ driver for a Sensirion I²C flow sensor, including configuration, measurement acquisition, error handling, and on-target validation.
- Implement the STM32U5 watchdog driver and integrate it with firmware initialization and fault-recovery architecture.
- Guide engineers in basic and advanced Git workflows and collaborative development practices.

Independent Software Engineering Experience - Principal Software Engineer

May 2025 - Present

Multi-tenant SaaS platform for modeling, calculating, and auditing complex sales compensation plans at scale.

- Architect and develop a multi-tenant sales compensation platform supporting organizations ranging from small businesses to multinational sales operations, with strict tenant isolation within a shared deployment.
- Engineered a scalable compensation engine capable of evaluating fully configurable commission plans, including tiers, accelerators, clawbacks, and overrides, with sub-second calculation times for individual transactions.
- Developed a full-stack system using React, TypeScript, and Tailwind CSS on the frontend and Go on the backend, with Docker providing reproducible development and deployment environments.
- Implemented a financially accurate and auditable calculation pipeline with complete traceability from commission results to source data and governing rules.
- Optimized transactional persistence and low-latency data access using MySQL and Redis, reducing compute overhead and improving application responsiveness.
- Applied systems-level profiling and performance optimization across the application and database layers, achieving ten-fold performance improvements in early benchmarks and real-world scenario testing.
- Lead end-to-end product development, including architecture, implementation, testing, deployment readiness, and go-to-market planning.

IQ Inc - Software Engineer IV

July 2018 - May 2025

FDA-regulated medical device - Heart pump | QNX RTOS | C++ | Qt

- Engineered embedded software for a life-sustaining medical device in a QNX RTOS environment on an ARM Cortex-A8 using C++ and Qt, contributing to successful FDA regulatory approval.
- Managed the BSP for the device.
- Led key aspects of the software development lifecycle, including architecture, multi-threaded design, unit/integration testing, and post-production support in a highly regulated environment.
- Provided technical leadership across the team, driving system design decisions, task estimation, and on-time delivery of critical features.
- Established and maintained design documentation and code quality processes, including code reviews and source control (Git), supporting compliance and long-term maintainability.

Distributed Railway Automation Systems | C++ | Qt | Squish | Docker

- Enhanced railway automation software in C++ and Qt while collaborating with global cross-functional teams, improving system reliability and reducing downtime.
- Debugged challenging issues in distributed code, including performance, translation, and system stability.
- Built distributed automated test systems using C++, Qt, Docker, and Squish-based UI automation.

Cross-Project Impact | SQL Performance | AWS Deployment | Debugging

- Optimized database design and SQL performance, reducing critical query execution times from hours to seconds and significantly improving system responsiveness.
- Deployed a containerized React application using Docker on AWS, implementing secure secret management (AWS Secrets Manager) for database credentials and environment configuration in under three weeks.
- Diagnosed and resolved complex system-level issues using advanced debugging, profiling, and performance analysis techniques across embedded and application layers.

Dream Center Education Holdings - Software Engineer IV

Feb 2007 - May 2018

- Maintained and extended enterprise systems built on CARS / Jenzabar CX, developing custom applications, stored procedures, and database triggers across 47 database instances.
- Resolved complex performance issues across C, C++, SQL, and Perl, improving system efficiency and stability.
- Designed and implemented database schemas and automation workflows to support evolving business requirements.
- Partnered with stakeholders to gather requirements and deliver complex reporting solutions using SQL.
- Supported data warehouse and ETL processes, ensuring reliable nightly data loads across multi-terabyte datasets.
- Identified and remediated security vulnerabilities, ensuring application integrity and compliance.
- Mentored team members and supported onboarding to internal systems and development practices.

Steel City Airsoft - Owner

2010 - 2016

- Directed operations for a business with 15 employees, including hiring, training, scheduling, and conflict resolution.
- Designed and built a fully custom software ecosystem in C++/Qt on Linux, supporting front desk operations, self-service kiosks, concessions, and administrative tools.
- Integrated software with hardware systems including RFID readers, webcams, scanners, printers, payment systems, and electronic access controls.
- Engineered a distributed system using Raspberry Pi devices to create synchronized, networked interactive game elements with coordinated audio and lighting.

True Baseline - Lead Software Engineer

2006 - 2007

- Ported a flagship Qt application from Windows to UNIX (HP-UX, Solaris), improving cross-platform compatibility.
- Delivered ahead of schedule (3 months vs. 6–9 month estimate) by isolating and abstracting platform-specific dependencies.
- Resolved system-level compatibility issues not natively supported by Qt, ensuring consistent behavior across environments.

Ohio University RoboCup Team - Lead Software Engineer / Linux System Administrator

2001 - 2006

- Developed Qt-based graphical interfaces, reducing debugging time and improving system observability.
- Rewrote the vision system in C/C++/ASM, improving performance and tracking accuracy.
- Implemented Kalman filter-based object tracking.
- Built low-level systems including a TCP/IP networking library and a capture card driver in C.
- Administered a network of Linux systems (Fedora) supporting robotics development and competition environments.
- Managed networking for mobile robotic systems and resolved issues during live competitions.

Nullsoft - Technical Support

2000 - 2002

- Supported Winamp users, moderated community forums, and reported recurring defects with actionable findings for engineering.