
Austin Tyler Conn

user@austinconn:~\$ resume --role embedded

Cyber Software Engineer · Reverse Engineer / Vulnerability Researcher · Embedded Engineer · Software Engineer
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Active TS/SCI clearance.

▣ Tailored view – Embedded / Firmware

SUMMARY

Embedded and low-level software engineer who designed an object-oriented software-defined radio (SDR) payload emulator at Northrop Grumman, and is comfortable from bare-metal C on microcontrollers through application code. Hands-on with ESP32/Xtensa, ARM, and additional architectures; firmware extraction and analysis; bus and debug interfaces (GPIO, UART, SPI, I2C, JTAG, SWD); SDR/RF; and industrial control systems (Allen-Bradley/Siemens PLCs, VFDs, UL-conformant panel design). Built a complete ESP32/ESP-IDF reverse-engineering toolchain for Ghidra and contributed Xtensa processor support upstream (now in Ghidra 11.0).

WORK HISTORY

Northrop Grumman Corporation – Cincinnati, Ohio

Program names and mission specifics omitted; descriptions generalized to releasable technology and skills only.

Cyber Software Engineer 02/2023 – Present

- Serve as a software engineer across multiple classified defense programs, with a focus on reverse engineering and low-level embedded development.
- Designed and implemented a software emulator for a software-defined radio (SDR) payload, implementing TCP/UDP and serial communication protocols using object-oriented design (inheritance and polymorphism).
- Delivered design and implementation of new product features; contributed to 25+ major customer deliveries across programs over tenure.
- Collaborated within program teams and coordinated across multiple teams and programs; mentored and helped onboard teammates.

Associate Cyber Software Engineer 08/2020 – 02/2023

- Test-automation engineer across defense programs, using an internal test framework and GitLab CI runners in support of multiple customer deliveries.
- Maintained and extended large program-specific automated test suites and GitLab CI pipelines (across multiple runners), and contributed upstream fixes to a shared internal test-framework repository used across programs.
- Received a BRAVO award for a rapid, quick-turnaround customer delivery that fulfilled urgent warfighter needs (in support of multiple quick-reaction capabilities / QRCs).

Cincinnati Precision Instruments – Cincinnati, Ohio

Information Technology Manager 02/2019 – 05/2020

- Built and maintained a production virtualization environment of 12 business-critical virtual machines; streamlined processes using IndySoft and QuickBooks.

Bugaboo Controls – Cincinnati, Ohio

Progressed from Specialist to a senior Foreman role; senior individual contributor rather than people manager.

Control System Specialist → Control Panel Foreman 2013 – 2015

- Designed, laid out, machined, assembled, and wired high-voltage industrial control panels across a range of applications — industrial/factory automation, HVAC and building systems, water/utility systems, and custom OEM machine builds.
- Programmed and worked hands-on with Allen-Bradley / Rockwell and Siemens programmable logic controllers (PLCs), variable frequency drives (VFDs), and electromechanical and solid-state relay logic.
- Consulted with the Engineering Department on discrepancies in dimensions, wiring specifications, panel layout, and incompatible parts prior to manufacture.
- Performed load and functionality testing of control panels, documenting all test procedures, corrections, and errors in conformance with Underwriter Laboratories (UL) specifications.

TECHNICAL SKILLS

Programming Languages: Python, C, C++, C#, Java, Assembly, VBScript, Pascal, Delphi (plus shell scripting; JavaScript/TypeScript and Go via open-source work).

Reverse Engineering & Vulnerability Research: Binary and firmware reverse engineering (static and dynamic analysis); Ghidra (custom processor modules, loaders, and scripting); fuzzing / vulnerability discovery (libFuzzer and harness development) and crash triage; custom/proprietary protocol analysis and emulation (TCP/UDP, serial, TDLs). Tooling: Ghidra, Fireflight, TAU, Nmap, Metasploit, OpenVAS, Wireshark, Snort, sguil, libFuzzer, SonarQube.

Processor Architectures / ISAs: Xtensa (incl. ESP32/Tensilica), ARM (32- and 64-bit / AArch64), MIPS, PowerPC.

Embedded & Low-Level: Bare-metal C/C++ on microcontrollers (register-level programming); RTOS-based development; bus and I/O protocols (GPIO, UART/serial, SPI, I2C, TCP/UDP); hardware debug/programming interfaces (JTAG, SWD); firmware extraction and parsing (e.g., ESP32 flash dumps).

Industrial Control Systems (ICS): Allen-Bradley / Rockwell and Siemens programmable logic controllers (PLCs), variable frequency drives (VFDs), electromechanical and solid-state relay logic, high-voltage control-panel design, and UL-conformant panel testing.

SDR / RF & Signals: Software-defined radio payload emulation and integration; SDR hardware (HackRF, RTL-SDR, BladeRF); Universal Radio Hacker (URH) for wireless-protocol reverse engineering.

Systems, Networking & DevOps: Ubuntu Server 14.04 and later, macOS 10.8 and later, Windows 7/10/11, Windows Server 2008+, Cisco, GitLab CI runners, Docker, Nginx/reverse proxies, self-hosted infrastructure, virtualization.

Tooling & Other: LaTeX, Git/GitHub, IndySoft, QuickBooks.

EDUCATION

University of Cincinnati – Cincinnati, Ohio

- Master of Science, Computer Science (May 2025)
- Bachelor of Science, Information Technology — Cybersecurity Track (2020)

Cincinnati State Technical and Community College – Cincinnati, Ohio

- Associate of Applied Science, Software Engineering

OPEN-SOURCE & NOTABLE CONTRIBUTIONS

Ghidra – Xtensa Processor Support

Developed a Tensilica Xtensa processor module for Ghidra (the architecture behind the ESP8266/ESP32) and contributed it upstream to the NSA's open-source Ghidra project. Xtensa support is now included in Ghidra as of version 11.0.

[Upstream PR](#) · [Repo](#)

ESP32 / ESP-IDF Reverse-Engineering Toolchain (Ghidra)

Built an integrated suite of tooling for reverse engineering ESP32 firmware in Ghidra — combining the Xtensa processor module, an ESP32 flash-dump loader, a firmware-image parser, a CMSIS-SVD peripheral loader, Ghidra Data Type (GDT) archives, and auto-generated function signatures (Rizzo / FunctionID) derived from ESP-IDF example binaries across IDF versions v2.0–v5.1.

[Flash-dump loader](#) · [SVD loader](#) · [Image parser](#) · [GDT archives](#) · [Rizzo signatures](#)

PERSONAL PROJECTS

Flagship – ESP32 / ESP-IDF Reverse-Engineering Toolchain for Ghidra

Built a complete toolchain for reverse engineering ESP32/ESP8266 firmware in Ghidra: a Tensilica Xtensa processor module (register windowing, MAC16, loop options) contributed upstream and now in Ghidra 11.0; an ESP32 flash-dump loader and firmware-image parser; a CMSIS-SVD peripheral loader; Ghidra Data Type (GDT) archives for the ESP-IDF SDK; and auto-generated Rizzo/FunctionID function signatures across IDF v2.0–v5.1.

[Xtensa module](#) · [Flash-dump loader](#) · [Image parser](#)

Highlight – YoLink Smart-Home Reverse Engineering (Case Study)

Self-directed reverse-engineering deep dive into YoLink's ESP32-based smart-home ecosystem. Reverse engineered the hub/gateway and battery-powered LoRa sensors at the firmware level using ESP32 flash extraction, Ghidra static analysis (via the Xtensa/ESP32 toolchain above), and FCC teardown intelligence (YoSmart, FCC ID 2ATM7). Recovered the security keys governing the sensor → hub → ChirpStack (LoRaWAN) data path and mapped device onboarding. YoLink shipped official local control before the project reached that goal, so it stands as a deep technical exercise rather than a released integration.

[RE write-up](#) · [yolink](#)

Automotive / Embedded

Set up comma.ai openpilot (open-source ADAS / driver-assistance) on a Volkswagen MK6 Golf — hands-on vehicle CAN-bus integration and embedded automotive hacking.

[Repo](#)

VOLUNTEER & AWARDS

Ohio Cyber Reserve (OhCR) – Southwest Ohio Region

- 02/2020 – 08/2021
- 08/2022 – 11/2023

BRAVO Award (Northrop Grumman)

For a rapid, quick-turnaround customer delivery that fulfilled urgent warfighter needs (in support of multiple quick-reaction capabilities / QRCs).

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