Anthony Rouneau



Embedded Software Engineer · C · Python · Embedded Linux · Security

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Embedded software engineer with a Master in Computer Science (first in class) and nine years of professional experience. I spent more than four years on the firmware of Ewon industrial VPN routers, from U-Boot and the Linux kernel up to the application layer, and finished there as firmware architect. Since 2022 I have been securing banking flows with HSMs and applied cryptography. I am now returning to embedded systems, on products where reliability and security both matter.

KEY SKILLS

Languages	**C** (daily for four years on firmware), **Python** (also taught it at university and to professionals), Bash, Java
Embedded Linux	Kernel debugging, user-space services, **Yocto** (ported a distribution to several platforms), **U-Boot**, board bring-up and flashing, **OTA updates** with A/B partitions
Hardware interfaces	SPI, Ethernet, 4G modems (AT commands); JTAG / SWD debug probes
Protocols	Modbus, OPC UA, MQTT, ZeroMQ, Protocol Buffers, NTP, TCP/IP networking, VPN
Debug & quality	gdb / gdbserver, core dumps, Valgrind, static analysis, measured optimisation, code review (Gerrit)
Build & CI	**CMake**, Yocto, Docker, Jenkins (nightly builds, analysis and tests), Git
Release engineering	End-to-end release chain owned at both Ewon and BNP: development, automated tests, end-to-end tests, changelog, **zero-downtime deployments**
Security	HSM, Secure Element, elliptic-curve / RSA / AES keys, Diffie-Hellman key exchange, HMAC, encrypted flash storage
Self-taught	**FreeRTOS**, I2C, UART, Buildroot, Zynq: learned on my own, not yet used professionally

EMBEDDED EXPERIENCE

Embedded Firmware Engineer, then Firmware Architect

Sep 2017 – Jan 2022

HMS Networks (Ewon) · Nivelles, Belgium · Linux-based industrial VPN routers and data gateways (Cosy 131, Cosy+, Flexy 201–205), connected to the Talk2M VPN cloud

- Developed firmware features end to end in **C on embedded Linux**, from kernel debugging to the web interface: WAN fallback across several interfaces to keep the device always connected, digital-input alarming.
- Worked close to the hardware: **board bring-up** and flashing, **U-Boot**, JTAG / SWD debugging, SPI peripherals at driver and protocol level.
- Worked on the gateway's connectivity: Ethernet, the VPN link to Talk2M, and the industrial protocols the Flexy speaks to machines and IT systems (Modbus, OPC UA, MQTT).
- Used ZeroMQ and Protocol Buffers messaging, NTP time synchronisation, and AT commands to drive the 4G modem.
- Ported the **Yocto** distribution to several hardware platforms; wrote and adapted recipes and classes.
- Debugged on target with gdb, gdbserver and core dumps; used Valgrind and static analysis on the C code base; optimised from measurements.

As firmware architect

- Responsible for keeping the code base maintainable and future-proof across product lines.
- Built and ran the CI/CD system (Docker, Jenkins, Gerrit) and mastered the release chain end to end: development, automated and end-to-end tests, changelog, release.
- Designed the move from a monolithic firmware to a **modular architecture**: separate processes under a supervisor, each isolated in its own chroot, with keep-alive monitoring and inter-process communication.

- Designed the new **over-the-air (OTA) update** system: A/B partition scheme on a root filesystem encrypted with the Secure Element.
- Co-designed a new **security architecture**: Secure Element, HashiCorp Vault, encrypted flash file system.
- Organised the merge of our code base into the group's global platform, with the Swedish headquarters.

SECURITY & SOFTWARE EXPERIENCE

Security Software Engineer
Jan 2022 – present

BNP Paribas Fortis · Brussels, Belgium · distributed security backends

- Secure the bank's flows with applied cryptography in production: **Hardware Security Modules**, elliptic-curve, RSA and AES keys.
- Work on key exchange (Diffie-Hellman) and message authentication (HMAC) between services.
- Own the software release chain end to end: development, automated tests, end-to-end tests, changelog and **zero-downtime deployments**.
- Bring secure architecture and software good practices to the teams. Stack: Java / Spring Boot, Docker, automated testing in Ruby.

Founder & Developer (self-employed, part-time)
2019 – present

Angeall Software · Anderlues, Belgium

- Design, build and host web and mobile products for small businesses, from first sketch to maintenance.
- Publisher of AngeallVet, a multi-tenant practice-management SaaS for veterinary clinics (**Python** / FastAPI, PostgreSQL, React, Docker), in production since 2026.
- Run the hosting myself: dedicated Debian servers, software RAID, nftables, Docker, backups.

EARLIER EXPERIENCE

Dec 2016	**Python instructor**, Rod Formation / Technocité. Wrote the course and exercises, then gave a three-day training to professionals.
Aug – Nov 2016	**Student developer**, EASI. Cross-platform Android / iOS app in C# (Xamarin) to track and reserve test devices by QR code.
2015 – 2017	**Student assistant**, University of Mons. Taught programming and algorithmics in Python to first-year students.
Aug – Sep 2015	**Student researcher**, University of Mons. Interfaced NAO humanoid robots with a Kinect v2 camera so that the robots react to human movement.

EDUCATION

Master in Computer Sciences, first in class with high distinction
2012 – 2017

University of Mons (UMONS) · rank and distinction over the full five-year curriculum · robotics, computer vision, machine learning

- Thesis: “Applying neural networks to simple video games”, with pyTGF, a Python framework to prototype tile-based games and train the AIs that play them (github.com/Angeall/pyTGF).
- Project: Connect4NAO, a humanoid robot playing Connect 4 with computer vision (Python, OpenCV).

LANGUAGES

French: native
English: fluent, used daily at work
Dutch: basic

BEYOND CODE

Half-marathon runner; squash is my favourite sport. Four years as a scout leader, qualified vacation-centre animator. Personal electronics projects on microcontrollers and Raspberry Pi. Guitar and music production.