

JONATHAN RICO

EMBEDDED ELECTRONICS & SOFTWARE ENGINEER

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SKILLS



Embedded system design

- Architecture
- Component selection
- Low power design



Embedded programming

- Embedded C, CMake
- Python
- ARM Cortex family, AVR, MSP430.
- uC: STM32, nRF52/53
- Zephyr RTOS



Debugging

- Electrical fault finding
- SoC / peripheral issues
- Low-level driver issues
- Realtime / race conditions
- Profiling



PCB design & prototyping

- Schematic and layout
- SMD stencil soldering
- Fine-pitch SMD rework
- Enclosure design

TOOLS



Software

- Linux, Docker
- CI and VCS: Git, Gerrit, GH, Bitbucket, Jenkins, Bamboo
- Emacs/vi, ST, Keil, Eclipse, Quartus.
- Debuggers: GDB, Segger Ozone



Lab equipment

- Multimeter / lab PSU
- Logic analyzer
- Oscilloscope, waveform gen
- Spectrum analyzer, BLE sniffer

EXPERIENCE

Embedded Software Engineer at Nordic Semiconductor - Oslo - Norway (2020 - present)

Tasks

- Work on Nordic Semi's Bluetooth LE stacks (Softdevice & Zephyr Bluetooth Host):
- Optimize code for size and speed
- Port firmware tests from C to python
- Setup Jenkins CI pipelines for running said tests
- Maintain the Zephyr RTOS Bluetooth host (Open-source on GH, @jori-nordic)
- Work closely with key customer to integrate their wireless solution in nRF Connect SDK

Achievements

- Identified and prototyped potential improvements in time-critical code
- Made (and ported) functional and stress tests in a mix of python (PC-side) and C (device-side)
- Made performance and non-regression tests using the Babblesim radio simulator
- Improved internal documentation, onboarding guides, automated the toolchain setup
- Analyzed and fixed a bunch of bugs, including race conditions and synchronisation bugs
- Caught quite a few issues by making a test pipeline with bleeding edge Zephyr RTOS (harder than it seems)

R&D Engineer at Expleo - Toulouse - France (2019 - 6mo)

Achievements

- Brought an universal part picker robot from paper sketch concept to working prototype, with a severely limited parts and time budget. Includes electronics, pneumatics, firmware and machine vision pipeline.

Consultant at ARCYS - Toulouse - France (2018 - 6mo)

Tasks

- Design and test/characterisation of a Binary I/O signal isolation and conditioning eurorack card (analog tech only)

Achievements

- Selected components based on reliability, sourcing and longterm availability. Designed circuit and made schematic.
- Simulated individual analog blocks (LTSpice), validated with real hardware (stress tests, limits, etc), made necessary rework and iterations to meet design specifications.
- Wrote extensive documentation (Design report, Test specification & report, etc..)

R&D Engineer at Maple High Tech - Toulouse - France (2019 - 2017)

Tasks

- Redesign the power supply and architecture of a geolocation beacon for low power and small size
- Port the (UWB) stack / baseband from STM32 to nRF52

Achievements

- Selected power-optimized components (PSU block & SoC), schematic, test and bringup of the new HW revision.
- Developed a flexible driver abstraction for use in the baseband, implemented for STM32 and nRF52 platforms.
- Moved the backend (python) and front-end (angular) server components to docker for easier deployment.

EDUCATION

Master - Electronics for Embedded Systems and Telecoms (2017 - 2015)

Major in digital systems - Université Paul Sabatier - Toulouse III

Associate's degree (BTS) - Electronic Systems (2014 - 2013)

Lycée Déodat de Séverac - Toulouse

PROJECTS

- Assembler for the SpinSemi FV-1 audio DSP written in Common Lisp. Hardware and GUI editor in progress.
- Binary RGB LED wristwatch, featuring: Gesture controls, multiplexed scrolling text display, Bluetooth LE features. nRF52-based, uses serial LEDs. Building on a previous watch that used an MSP430 and monochrome leds.
- Guitar FM transmitter: matchbox-sized unit that plugs directly into an electric guitar. Amplifies, compresses and transmits the resulting audio over standard FM radio frequencies. AVR-based.
More on my website (see header).