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Embedded Software Engineer

Multi-threaded environment, Real-time constraints

Bootloader, Kernel, User space (Buildroot / Yocto / RTX)

C/C++, Python, Bash, Shell

EDUCATION

2004 - 2010 : **Engineering school, Polytech'Montpellier (ex ISIM), in electrical engineering and industrial control fields.**

WORK EXPERIENCE

Sep. 2024 – Today : **Embedded Software Consultant, Nystera / XAP (Pérols, France).**

- ➔ Programming a telemetry solution for racing cars (STM32, C, RTX).
  - Real time, multi-threaded environment with HAL.
  - UART, USB, Wi-Fi, 4G LTE, TCP (TLS) / MQTT(S), GPS protocols.
  - Visualization with Thingsboard through a custom Thingsboard TCP gateway in Python.
  - Asset management with Snipe IT.
- ➔ Setting up embedded dashboard environment (STM32MP1, STM32H7, C, Buildroot, RTX).
  - Hardware validation (RTC, Ethernet, ADC, GPS, WiFi/Bluetooth).
  - Buildroot setting up (TF-A, U-Boot, Linux drivers & applications).
- ➔ Programming a social platform for travelers.
  - Frontend (ReactJS), backend (NodeJS), DB (PostgreSQL), Docker.

Feb. 2023 – Aou. 2024: **Embedded Software Engineer, T&S / Actia Railway (Millau, France).**

- ➔ Programming the displays for the rail transports in Paris (C/C++, Yocto).
  - Software architecture (onIT, Kubernetes, applications and IPC).

Oct. 2019 – Jan. 2023: **Embedded Software Engineer, Soledge (Clapiers, France).**

- ➔ High-end audio embedded software development on Armadeus OPOS6UL(L)/IMX6UL(L) (C/C++, Linux/Buildroot).
  - Synchronization / Syntonization over PLC.
  - Software architecture.
  - U-Boot, device tree and drivers setting up.
  - Startup (/etc/init.d/ scripts) and configuration (UCI & filesystem) management.
  - Remote communication (SSH and remote SSH).
  - Roon/Optical SPDIF/Spotify protocols and restreaming support.
  - Multiroom management.
  - Test automation.
- ➔ App development to scan network and access the speaker webpage with its IP address.
  - Web app using Qt 5.14, based on Webview component.
  - Cross-platform compatibilities (Windows, Linux, Android, macOS, iOS).
- ➔ Web development to control speakers.
  - Frontend with VueJS.
  - Backend with NodeJS/ExpressJS.

Nov. 2017 – Jul. 2018 : **Embedded Software Engineer, Quetzal / Schneider Electric (Victoria, Canada).**

- ➔ Programming the ION9000 meter with VxWorks (C/C++, Python).
  - Windows / Linux VM environment.
  - Precision Time Protocol (PTP) implementation.
  - Debugging / Tests with cppUnit and python scripts.
  - Versioning with Perforce.

Oct. 2016 – Jun. 2017 :

Software Engineer, Amaris / Engie (Montreal, Canada).

➔ Programming a software for safety cameras, to identify humans and avoid intrusions into a restricted area (C/C++, Qt).

- Windows, multi-threaded environment.
- OpenCV library for image treatment.
- Versioning with Git.

Oct. 2011 – Aug. 2015 :

Embedded Software Engineer, 2S2I / Schneider Electric (Lattes, France).

➔ Programming the SPEAR 1300 microprocessor with VxWorks (cross-compilation with Windows, C/C++).

- New generation of Digital Control System (embedded system with real time constraints).
- Software architecture.
- Abstract layer Windows / VxWorks.
- Middleware (Object Oriented Programming) with IEC61850 database management and publishing.
- Multi-threaded environment, Inter-Process Communication (IPC) with sockets, message queues, shared memory and Remote Call Framework (RCF).
- Writing design specifications (UML) and documentation.
- Timing and memory optimizations (Workbench analysis).
- Quality checks with coding styles, MISRA rules (Klocwork), and unit tests.
- Versioning with ClearCase, SVN.

Oct. 2010 - Sep. 2011 :

Embedded Software Engineer, Oktalogic (Montpellier, France).

➔ Programming the Freescale MCF5235 microcontroller with uCLinux (C/C++).

- Linux-like programming (architecture, drivers).
- Geolocalization system (GPRS, GPS).
- Compressing / Uncompressing files transferred from FTP.
- Tires pressure monitoring (J1939 protocol through CAN bus).
- Tachograph data recovery (FMS protocol through CAN bus).
- Bus communication (CAN, I²C, UART).
- Smartcard communication (ISO 7816).
- Memory management and threads analysis with Valgrind.

Feb. 2010 - Aug. 2010 :

Internship, Cortus SA (Montpellier, France).

➔ Design of a CompactFlash controller (IP) for the APS3 processor.

- Programming languages: Verilog, C/C++.
- Tools: Makefile, Quartus, ModelSim, Eclipse (gcc, gdb).
- Simulation with Stratix II EP2S60 FPGA.

➔ Optimization of a system's maximum frequency.

- Tools: TimeQuest Timing Analyzer and LogicLock (Quartus).
- Decreasing the *slack* of the critical path.

Oct. 2009 - Jan. 2010 :

Graduation project, Satin IP (Montpellier, France).

➔ Setting up quality closure of a System on Programmable Chip design flow.

- Altera's tools: Quartus, SOPC Builder, NIOS II IDE.
- Setting up *Sensors* and *Quality Checks* with VIP Lane, using RegExp language.

Sep. 2008 - Sep. 2009 :

Caesura year, Ridgetop Group Inc. (Tucson AZ, USA).

- ➔ Determination of the noise influence on an electrocardiograph.
  - Simulation with Simulink.
- ➔ Analog design of a *9-bit incremental ADC*.
  - SILVACO platform (Gateway, SmartSpice).
  - XFAB technology, XDM10 (1um, 5V).
- ➔ ADC characterization (INL, DNL).
  - Sinusoidal histogram method.
- ➔ Design of a *Range Finder* (>200m).
  - Components selection.
  - Programming the Renesas SH7264 microcontroller using HEW (Renesas SH C compiler): loader + stub, interrupt vectors, I²C, UART, ADC.
  - After-sales service.

SKILLS

Languages:	**French**: mother tongue. **English:** good level (TOEIC B2: 905). **Spanish:** basic level.
Operating systems :	Windows, Linux, Unix Yocto, Buildroot, RTX
Programming languages :	C, C++, VHDL, Verilog, Python, HTML, CSS, Javascript.
Frameworks :	Qt, Wordpress, VueJS, ReactJS, NodeJS, ExpressJS.
IDE :	Visual Studio, Eclipse, Workbench, Quartus II, Xilinx ISE.
Tests :	cppUnit, Jenkins.
CAD :	Orcad, Cadence, Altium.
Numerical computing :	Matlab, Simulink, LabVIEW.
Versioning :	SVN, ClearCase, Git, Perforce.

ACTIVITIES

- Computer lessons to retired people.
- Animal welfare.
- Sports (badminton, natation, hiking).
- Travels, travels and travels again.