



NICOLAS LANTZ

EXPERT HW & SW IN INNOVATIVE EMBEDDED SYSTEMS

19 years of experience

"I like to take on technical challenges to push innovative and ambitious projects forward"

T : +33 6 19 07 43 43
m : nicolas.lantz@ubicore.net

38600 FONTAINE - France
web : www.ubicore.net

BIO

I have deep experience in disruptive technologies as well as more industrial projects, always keeping focus on innovation !

I have a proven track-record of quickly immersing myself in new environments, understanding the key challenges and proposing solution that will be easy to implement, versatile and with the best ROI.

EXPERTISE

- IoT, Embedded systems
- Open source software
- Electronic & Microelectronics
- Algorithms, physic and mathematics
- Optics : LIDAR, Wind doppler LIDAR
- Audio codec & compression
- Protocols conception (wired & wireless)
- Sensors : MEMS, Gaz/Environnement, Piezo

EDUCATION

2004 - MASTER DEGREE, INSA - LYON

Electrical engineering, specialization in electronics & microelectronics.

HOBBIES

Paragliding (hike and fly), kite-surfing, mountain biking, cross-country skiing...

TECHNICAL SKILLS

EMBEDDED KERNEL/OS

Linux : Buildroot, Yocto,

RTOS : ZephyrOS, FreeRTOS,

BOOTLOADER

U-boot, tf-a, optee, mcumgr

LANGUAGES

C, Python, JAVA, Javascript

PYTHON LIB

asyncio, dbus-next

FRAMEWORKS AND TOOLS

Eclipse, GIT, GCC, make, ninja, KICAD

MICROPROCESSORS/FPGA

ARM CORTEX-M0/M3/M4 A7, nrf52, octavo SIP, ZYNQ 7000 SoCs, DSP C665x

PROTOCOLS/INTERFACES

USB, I2C, SPI, I2S, QSPI, PCM, SAI, Ethernet, RGMII, Ethercat, PTP IEEE1588

WIRELESS

Bluetooth, WiFi, Custom FHSS@ 2.4Ghz

BLUEOOTH PROFILES

On Bluez or zephyr stack: BLE, BLE Mesh, Gatt, a2dp, HFP

AUDIO

Alsa, bluezalsa, OPUS codec

DEBUG/PROFILING

openocd, GDB, Jtag, Perf, oprofile, valgrind

SYSTEM

OTA firmware update, power management, boot mode

PROFESSIONAL EXPERIENCE

2010 - Now - FOUNDER OF UBICORE - GRENOBLE.

Some of my lastest customers and projects :

HED TECHNOLOGIES - UNITY (2 YEARS)

Linux firmware for audio wireless headphone.

As a technical leader I maintained the yocto platform and implemented or worked on all part of the firmware (including bootloader, update OTA). The firmware was mainly based on SystemD services using Dbus and implemented in C or Python. I also worked on Alsa audio lib or the wireless aspects (wifi, bluetooth BR/EDR and BLE Gatt sever).

The international team was supported by a continuous integration flow based on gitlab server, docker...

LINKIO (1 YEARS)

Linkio develop Iot products and I joined them to create some essential bricks of theirs standard BLE Mesh SIG solution.

I setting up a new base platform under zephyr RTOS and migrate the existing firmwares, built on Nordic nrf5 SDK + the proprietary SoftDevice, to fully open source zephyr solution. I was the principal technical referent for Zephyr RTOS the BLE Mesh stack.

KYOLIS

- Manageable network Gb switch with SFP (optical fiber) interface: Feasibility study, POC & prototype based on octavo SIP processor and linux (custom buildroot build) to support SNMPv3.

OPHRYS

- Digital Tour Guide System : Feasibility study & POC realisation for Wireless multicast audio streaming on 2.4Ghz ISM band : FHSS, PCM and opus (see opus-codec.org) audio compression on nordic nrf52 with zephyr-os.

- Audio-guide : Linux driver development on iMX28 (Low-Power-Mode, Clock, device-tree, fuelgauge, charger, OLED screen...).

EASII-IC

- BLE (Bluetooth Low Energy) Mesh for lighting : State of the art, Expertise, architecture and proof of concept on nrf52 with zephyr-os
- BLE Mesh Web Provisionner: Architecture & implementation of a Mesh Proxy stack and provisionner in JS using the web bluetooth API.
- Li-Fi lamp (wireless communication by light): SW Architecture and implementation on Zynq FPGA (with FreeRTOS).
- Video processing: Embedded Linux on Xilinx Zynq-7000 AP SoC ZC706 : setup, Linux drivers for custom IP..

COTHERM

- Thermostats : Expertise and SW Architecture for thermal smart regulation.
- Simulation and co-simulation : Development of simulation and co-simulation thermodynamic tools to test thermostat firmware.

ORSYS

- Training session: animate training session for Linux embedded system developers.

SPLUUS

- Security system for skiing: Feasibility study & POC realisation for an innovative security system based on MEMS.

LUMIPLAN

- Destination indicator controller: Add ethernet (TCP/IP and FTP) and wireless (WIFI) connectivity.

STMICROELECTRONICS

- Development and verification of embedded firmware for video sensor.

STERICSSON

- ROM FW development for embedded processor (drivers and boot sequence).

TIEMPO-IC

- Development and fabrication of electronic board with prototype of secure asynchronous integrated circuit (clock-less) : CAD and manufacture.
- Full implementation of a debug monitor/bootloader on new prototype of asynchronous IC.

BH-TECHNOLOGIES

- Container lifting by motion detection: Expertise and algorithm development on inertial sensor.

UBICORE (INTERNAL DEVELOPMENT 16 MONTHS).

Other achievements for customers or internal developments :

- Prototype platform for ARM CORTEX-M3 and inertial sensors : HW & SW.
- Algorithm development and implementation for inertial sensors :
 - Full calibration algorithms (Hard, Soft Iron and other...): nonlinear regression on an ellipsoid.
 - DCM filter with quaternion for AHRS (Attitude and Heading Reference System).
 - FFT on embedded very low power systems.

Other UBICORE customers :

MICHELIN, ADEUNIS, NOVADAY, STAUBLI, PETZL, OROS, FRESENIUS-KABI, DEVICE-ALAB, ENERBEE, ATIM-RADIOCOMMUNICATIONS

2009 – 2010 – SENSARIS – CROLLES.

- Design and industrialization of a range of sensors named "Senspod" used, for inertial measurement or the environmental parameters acquisition, in many laboratories around the world (Sagem Wireless, MIT, Sony...).
- Architecture of the back office platform "Sensnet" : data aggregation, geolocation and sensors management.
- Business development.
- IT infrastructure.

FROM 2004 TO 2008 :

Various professional experiences in R&D Laboratories, consulting companies and start-ups.

STERICSSON – GRENOBLE (5 MONTHS).

- Video subsystem : SW and RTL simulation for API Verification.

FRANCE TELECOM R&D (NOW ORANGE GROUP) – MEYLAN (18 MONTHS).

- Self-reconfigurable Zigbee gateway (ARM7 + FreeRTOS + TCP/IP + Zigbee).
- Demonstrator of cognitive sensor networks : First implementation of kernel dynamic reconfiguration on 8bits chips (through RF link) using Fractal component model : THINK. Design of a cognitive dynamic frequency hopping protocol.

TEMEX SYNC (NOW SPECTRACOM) – LES ULIS (5 MONTHS).

- Drafting of business proposal for time-frequency station.
- Development of tools for automatic generation of minimalist Linux embedded system used for Time & Frequency sub-systems in military submarine (Embedded Debian and minimal system based on Uclibc and Buildroot).

ETACTIS-NETFFECTIVE (STARTUP) – NANTERRE (8 MONTHS).

- Highways toll collection systems : R&D and prototyping of newer system based on Linux embedded systems and RFID Tags.