



EXPERT HW & SW IN INNOVATIVE EMBEDDED SYSTEMS

15 year's experience

“I like to take on technical challenges in innovative and ambitious projects”

Nicolas LANTZ - T : +33 6 19 07 43 43 - m : nicolas.lantz@ubicore.net
web : www.ubicore.net - **UBICORE est agréé CIR jusqu'en 2021**

PRESENTATION

I work on disruptive technologies such as : haptic feedback (friction modulation for touch screens), lifi, MEMS algorithms / inertial units; as well as for microelectronic : complex heterogeneous processor, fpga or on more industrial projects. But always with a main component focused on innovation!

I have the ability to quickly immerse myself in a new environment, understand the key points and propose the solution that will be easier to implement, versatile and will have the best ROI.

EXPERTISE DOMAINS

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

EDUCATION

2004 - MASTER DEGREE, INSA DE LYON

Electrical engineering, specialization in electronics & microelectronics.

TECHNICAL SKILLS

EMBEDDED KERNEL/OS

Linux : Buildroot, Yocto,
RTOS : ZephyrOS, FreeRTOS,

LANGUAGES

C/C++, JAVA, Javascript, Python

FRAMEWORKS AND TOOLS

Eclipse, GIT, GCC, GDB, make, ninja, KICAD

MICROPROCESSORS/FPGA

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

PROTOCOLS/INTERFACES

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

RADIO

Bluetooth, BLE, BLE Mesh, Custom FHSS@ 2.4Ghz

PROFESSIONAL EXPERIENCE

2010 - PRESENT - FUNDER OF UBICORE - GRENOBLE.

Some of my lastest customers and projects :

KYOLIS

- Manageable network Gb switch with SFP (fiber optical) interface: Feasibility study, POC & prototype based on octavo SIP processor and linux 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 audio compression on nordic nrf52.
- 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.
- 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.
- 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...).
 - DCM filter with quaternion for AHRS (Attitude and Heading Reference System).
 - FFT on embedded very low power systems.

Other UBICORE customers :

MICHELIN

ADEUNIS RF

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 Laboratory, consulting company and start-up.

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-NETFEKTIVE (STARTUP) – NANTERRE (8 MONTHS).

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