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"

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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/Envirronement, 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

Blueootth 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)

Architecture and implementation of a Linux based firmware for the first wireless WiFi (and BT) Hi-resolution (24bit@96kHz) headphone.

I maintened the yocto plateform and implemented or worked on all part of the firmware manily based on systemd service using Dbus and implemented in C or python.

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 algorithme developpement 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 susbsystem : 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-Netfective (startup) – Nanterre (8 months).
- Highways toll collection systems : R&D and prototyping of newer system based on Linux embedded systems and RFID Tags.