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**Contract** : Independent

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## **NICOLAS LANTZ**

### **EXPERT HW & SW IN IOT AND INNOVATIVE EMBEDDED SYSTEMS**

(15 year's experience)

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#### ***PRODUCT EXPERTISE***

Consulting in innovation and product conception :

- Study of user expectations and potential market.
- Search for technical solutions and identifying business opportunities.
- Risk management in product development process
- Complete product development and manufacturing until selling.

#### ***TECHNICAL EXPERTISE***

- IoT, Embedded systems.
- Open source software: Linux, RTOS
- MEMS sensors and algorithms.
- Electronic, Mechatronic, Optics (LIDAR).
- Protocols conception (wired & wireless).
- Physic and mathematic.

#### ***APPLICATION DOMAINS***

- Research, Microelectronics, Robotics, Medical, Wireless-telecommunication, Video-processing, Environment...

#### ***TECHNICAL SKILLS***

<b>EMBEDDED KERNEL/OS</b>	Linux (Buildroot, Yocto), RTOS (Zephyr, FreeRTOS, chibios), Android.
<b>LANGUAGES</b>	C, C++, JAVA, Javascript, Python...
<b>FRAMEWORKS AND TOOLS</b>	Eclipse, GIT, GCC, GDB, make...
<b>MICROPROCESSORS</b>	ARM CORTEX-M0/M3/M4, ZYNQ 7000 SoCs, DSP C665x...
<b>PROTOCOLS/INTERFACES</b>	Ethernet, Ethercat, PTP IEEE1588, Bluetooth, BLE Mesh, USB, I2C, SPI, Zigbee, Lora, sigfox...
<b>SENSORS</b>	MEMS, Gaz/Pollution/Environnement sensors, Piezo, Laser/LIDAR Doppler

#### ***EDUCATION***

##### **2004 – MASTER DEGREE FROM INSA DE LYON.**

- Multidisciplinary training in electrical engineering, industrial automation, electronics and telecommunications.
- Specialization in electronics and microelectronics.

## **PROFESSIONAL EXPERIENCE**

### **FROM 07/2010 - FUNDER OF UBICORE / INDEPENDENT - GRENOBLE.**

Ubicore is a small consulting company created to provide advice and expertise on new innovative technologies to its customers.

#### **OPHRYS**

- Feasibility study : Wireless multicast audio streaming on 2.4Ghz ISM band.
- POC for evaluation : Wireless multicast audio streamer and recorder.
- Research and evaluation of an audio codec adapted to radio frame lost and microprocesseur limited processing resource.

#### **ENERBEE**

- POC for evaluation : Gateway for lot radio sensor working with energy harvesting

#### **EASII-IC**

- BLE Mesh : State of the art, Expertise, architecture and proof of concept.
- Architecture and implementation of a Mesh Proxy stack and a Provisionner in javascript on web bluetooth API.

#### **EASII-IC / OLEDCOMM**

- SW Architecture and implementation for Lifi lamp (on Zynq FPGA).

#### **COTHERM**

- Expertise and SW Architecture for controller/regulation.
- Development of a simulation and co-simulation thermodynamic tools.
- Modeling and simulation of a double tank water heater

#### **ORSYS**

- Trainer for a training session on the embedded Linux system.

#### **DEVICE-ALAB**

- Porting a Android NDK application for IR video sensor.

#### **SPLUUS**

- Research : Algorithms for an innovative inertial system using MEMS and dedicated to sport.

#### **OPHRYS**

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

#### **EASII-IC**

- Embedded Linux on Xilinx Zynq-7000 AP SoC ZC706 : setup, Linux drivers for custom IP...

#### **STAUBLI**

- Setup of a Gigabit internet interface on DSP C6657/4 (CCSv6, NDK, modification and integration of the PHY and Emac driver).

#### **FRESENIUS-KABI**

- Feasibility study for a new innovative Drug infusion wearable micropump.

#### **LUMIPLAN**

- Software development on STM32 to add ethernet (TCP/IP and FTP) and wireless (WIFI) connectivity to embedded destination indicator controller.

#### **OROS**

- Custom embedded Linux on xilinx Zynq 7000 platform (cortex A9+FPGA) and IEEE1588 PTP daisy chain devices synchronisation with DP83640 PHY : custom linux, bootloader (u-boot) configuration, scripts and applications for full auto-detection and auto-configuration in daisy chain (with precision of 8ns PHY to PHY through Ethernet, and 1ns PHY to PHY on same board) .

#### **MICHELIN**

- R&D and expertise on advanced research project for very low power small measuring device.

#### **ADEUNIS RF**

- Hardware architecture and software development on small RF device with USB Composite.

#### **NOVADAY**

- Technical feasibility studies and market opportunity assessments for a new wireless Light Management Systems.

#### **STAUBLI**

- Expertise HW and SW on electronic control board applied to a 6-Axis robots (current loopback, position control).

#### **PETZL**

- Expertise on small wireless devices with audio capabilities : architecture and network protocols.

#### **STMICROELECTRONICS**

- Development and verification of embedded firmware for video sensor.

#### **STERICSSON**

- ROM Firmware development for high integrated 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**

- Expertise on inertial sensor applied to motion detection.

#### **ATIM RADIOCOMMUNICATIONS**

- Prototyping of new wireless products based on Cortex-M3, very low power (10 year battery life) and very long range modem (> 50km), inertial sensors, GPS positioning.

#### **UBICORE ( INTERNAL DEVELOPMENT 16 MONTHS).**

Other achievements for customers or internal developments :

- Prototype platform for ARM CORTEX-M3 and inertial sensors :
  - Hardware design and production.
  - Port of the real-time kernel FreeRTOS, USB stack, boot-loader, console...
- 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.

#### **2009 - 2010 - SENSARIS - CROLLES.**

Sensaris conceive lot sensors applied to Health and environmental sensors.

- Business development : strategy, investors relation, business plan.
- IT infrastructure : Intranet, Extranet, website and development tools/environment.
- Research and Development :
  - 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.

#### **FROM 2004 TO 2008 :**

Various professional experiences in R&D Laboratory, consulting company and start-up.

#### **STERICSSON - GRENOBLE ( 5 MONTHS).**

- Software development and RTL simulation : API Verification for video module.

#### **PURPLE LABS (NOW MYRIAD GROUP) - BOURGET DU LAC ( 3 MONTHS).**

- Software development, integration and profiling for telephony.

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

- Self-reconfigurable Zigbee gateway prototyping (ARM7 + FreeRTOS + TCP/IP + Zigbee).
- Demonstrator of cognitive sensor networks (research project) : 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).**

- R&D and prototyping of new lower cost toll collection systems (for highways taxes) based on Linux embedded systems and RFID Tags.