

Dany LE | Curriculum Vitae

🏠Grenoble

☎ 07 82 38 ** ** ✉ contact@iohub.dev

🌐 <https://iohub.dev>

“ PhD/Engineer in Computer Science - 6+ years of experience. C/C++, RUST, Yocto Linux, embedded Linux, embedded middle-ware, embedded Cybersecurity, ROS based robotic system, robot navigation and mapping, FPGA, ARM ”

Education

- 📖 **PhD in computer science** *Brest, France*
2014-2017
Université de Bretagne Occidentale
- 📖 **Master in applied computer science** *La Rochelle, France*
2011-2013
Université de La Rochelle
- 📖 **Engineer in computer science** *Danang, Vietnam*
2004-2009
Polytechnic School of Danang

Previous Employment

- 📖 **Elsys Desgin** *Grenoble, France*
2019-2020
Industrial Embedded software designer (from 11/2019 - now)
Working as embedded software designer (Ingénieur d'étude confirmé)
- 📖 **INRIA Lille Nord Europe** *Lille, France*
2018-2018
3 months, research engineer (7/2018-9/2018)
Developing a robotic application in Pharo (Smalltalk) language in cooperating with the ROS middleware
- 📖 **IMT Lille-Douai** *Douai, France*
2017-2019
2 year, Post-Doc
Working as a postdoc in the research of AI-based mono and multi robot exploration of unknown environment using Robotic Operating System (ROS).
- 📖 **ENSTA Bretagne and IMT-Lille Douai** *Douai and Brest, France*
2014-2017
3 year, PhD
Working as researcher, participation in the research of the application of object-oriented design methodology in embedded systems.
- 📖 **Danang University of Architecture** *Danang, Vietnam*
2010-2011
2 year, teaching
Work as a tutor, participation in the teaching of basic computer science disciplines.
- 📖 **IFI JSC.** *Danang, Vietnam*
2009-2010
Developer
Developer: participation in the design and development of an online document and CV management/archiving platform using modern web technologies.

Projects

Work projects

- 📖 **Industrial embedded project dedicated to a train controlling system** *Elsys Design, Grenoble (2019-present)*
Industrial embedded software designer

Keywords: Linux driver, Embedded system, Yocto linux, middleware, software designer, automatic test, integration test, networking, continuous integration

Skills: C, C++, Python, Rust, TCP/IP, Yocto linux, Jenkin, git

Working as software designer (on behalf of Elsys), my current mission focuses mainly on the development of an industrial embedded software system dedicated to train controlling:

- Participate to the documentation of specification, interface description, and test planning
- Design and develop a new on-board maintenance middle-ware/service in **C, Rust**
- Participating in the development and maintenance of a **Yocto Linux** layer for the embedded Linux distribution

- used by one of the hardware boards of the controlling system
- Linux driver development
- Develop and test new feature of the existing software system
- Porting and test legacy softwares on new embedded board (in C)
- Setup new continuous integration test bench for the new system

Multi-robots autonomous exploration of un known environment in ROS

IMT Lille-Douai, France (2017-2019)

Post-Doc, research project

Keywords: ROS, distributed system, middleware, robotic, mono and multi-robot SLAM, autonomous exploration, multi-agent, Vector map, PolySLAM

Skills: ROS, C, C++, Python, PharOS (ROS binding for Pharo Smalltalk), TCP/IP, linux

CPER-Data European research project: Working as researcher in the robotic domain, particularly in: autonomous navigation, SLAM, multi-robot SLAM and navigation. We worked on PolySLAM, a new SLAM algorithm that produces vector based maps (PolyMap). This kind of map proved its advantage in multi-robot context thanks to its compact format that reduces the network overhead when exchanging the maps in a collaboration (autonomous) exploration.

Software/FPGA Co-design for Edge-computing: Promoting Object-oriented Design

PhD, research project

IMT Lille-Douai and ENSTA Bretagne, France (2014-2017)

Keywords: IoT, FPGA, edge-computing, middleware, Sensor network, Object Oriented, modelling, HW design, SW/HW co-design, embeded system

Skills: VHDL, middleware architecture, C, C++, Smalltalk, UML, FPGA, ARM, embeded linux, network programming, language virtual machine

Edge-centric computing for IoT requires sensors nodes with more software capability and processing power while being constrained by energy consumption. Hybrid hardware systems consisting of FPGA and processor (ARM) offer a good trade-off for this requirement. Applications design for such hybrid network/software/hardware (SW/HW) system remains always a challenged task. Our motivation is to propose a homogeneous design methodology and environment for such system. We study the application of a modern design methodology, in particular object-oriented design (OOD), to the field of embedded systems. We aim at using OOD to develop a homogeneous design environment for edge-centric systems. Our approach addresses three design concerns: (1) *HW design, where object-oriented principles and design patterns are used to improve the reusability, adaptability, and extensibility of the HW system.* (2) *HW / SW co-design, for which we propose to use OOD to abstract the SW/HW integration and the communication that encourages the system modularity and flexibility.* (3) *middleware design for Edge Computing which rely on a centralized development environment for distributed applications, while the middleware facilitates the integration of the peripheral nodes in the network, and allows automatic remote reconfiguration both SW and HW (FPGA).*

Optimization by parallelization of the 3d elastic Free Form Deformation algorithm

Master 2, research project

DSV/I2BM/MIRCen - CEA Fontenay-aux-Roses, France (2012)

Keyword: Bioinformatic, 3D image registration, image processing, Computer vision

Skills: Python, C/C++, openCV, linux, teamwork

Working in bioinformatic domain, my work addresses an optimization and parallelisation solution for an elastic 3D Freeform Deformation (FFD) algorithm implemented at MIRCen. The goal is to optimize the 3D mapping of biomedical multimodal mono and inter-subject data whose volume is increasing exponentially.

Interfacing the ArcRisk earthquake simulator and the GAMA platform

Master 1, research project

Institut Francophone International and Vietnam Geophysical Institute (2011)

Keywords: Simulation, GIS, GAMA, Multi-agents system, modelling

Skills: Java, GAML, GIS

Participation in the research of modeling and simulation of complex systems, a collaboration project between IFI and Vietnam Geophysical Institute: the objective is to set up a **multi-agent** simulation model to evaluate an earthquake rescue protocol using ArcRisk's geographic data (GIS) and the GAMA modeling and simulation platform

Digital Asset Management System

HD2NET, Paris – France

Fullstack developer, Industrial project (internship)

Skills: Web technologies, PHP, HTML, CSS, Javascript, MySQL, linux, C, web server development

Working as developer, participation in the "Digital Asset Management System" (DAMS) project, a software project for managing multi-media files online, in a collaboration between HD2NET, EISTI University and EPITECH University, Paris.

Personal projects

Jarvis the DIY robot

DIY Robot system for indoor autonomous exploration and navigation

It is one of my hobby project outside of my job. My goal in this DIY project is to make a low-cost yet feature-rich ROS (Robot Operating System) based mobile robot that allow me to experiment my work on autonomous robot at home.

More information at: <https://doc.iohub.dev/jarvis/>

🚩 **Galleon**

ROS based event driven control and visualization toolkit for PhaROS

Keywords: Pharo Smalltalk, PhaROS, ROS, robotic, visualization toolkit

Skills: Smalltalk, ROS, C, C++

A ROS control and visualization toolkit for the Pharo language (Smalltalk), it is built on top of the PhaROS client, provides the visualization API for our new PolySLAM algorithm. Galleon and the PhaROS client have won the **3rd Innovation Technology Awards (15th Edition)** of **ESUG 2018**. (<https://esug.github.io/2018-Conference/awardsSubmissions2018.html>)

For more information: <https://github.com/lxsang/Galleon>

🚩 **AntOS**

A web desktop for accessing embedded linux or linux server from browser

Keywords: web OS, web technologies, Web API, UI design, system design

Skills: Javascript, CSS, HTML, Coffee script, Typescript

AntOS is a front-end API that mimics the traditional desktop environment on the web browser. The original purpose of AntOS is to provide visual tools to access and control resource on remote server and embedded linux environment. With its application API and the provided SDK, AntOS facilitates the development and deployment of user specific applications.

For more information: <https://doc.iohub.dev/antos>

🚩 **And many more...**

Many of my personal or work projects are hosted on my Github page at: <https://github.com/lxsang> or on my blog <https://blog.iohub.dev>

Awards

🚩 **ICARSC2019: Best paper award - Industrial Robot**

Porto-Portugal

Award for the paper: 'PolySLAM: a polygon-based SLAM algorithm'

19 IEEE Conference on Autonomous Robot Systems and Competitions

[Link to certificate](#)

🚩 **ESUG 2018: Innovation Technology Awards 15th Edition**

Cagliari, Italy

3st Innovation Technology Awards for PhaROS, a ROS based client for Pharo

Authors: Santiago Bragagnolo, Luc Fabresse, Xuan Sang Le, Noury Bouraqadi

<https://esug.github.io/2018-Conference/awardsSubmissions2018.html>

[Link to Certificate](#)

🚩 **IWST 2015 Best paper**

Brescia, Italy

Award for the paper 'A meta model supporting both hardware and smalltalk-based execution of fpga circuits'.

[Link to certificate](#)

Languages

🚩 **French (franco-vietnamese)**

fluent in writing and speaking

🚩 **English**

fluent in writing and speaking

🚩 **Vietnamese**

native language

Technical skills

🚩 **Programming skills**

C, C++, Rust, Pharo (Smalltalk), Python, Ruby, Java, PHP, Lua, Shell script, VHDL, HTML, Javascript, CSS, Coffee script, Typescript, Yocto Linux Also basic ability with: Assembly, Matlab, nodejs, RESTful web services, Linux, buildroot, Android

■ Softwares

Latex, Libre Office, SVN, git, KiCAD (PCB design), FreeCAD (3D design), Cura 3D (3D printing)

■ Embedded and robotic system

ARM Cortex M0/M3, AVR 8/16 bit, Arduino, Raspberry Pi, NVIDIA Jetson nano, Xilinx Zynq, armadeus APF51, Xilinx Spartan 6, sensor network, distributed and IoT system

■ Other

Parametric 3D model design & printing (**3D printer**)

Soft skills: Autonomous, team work skill, multidisciplinary domains flexibility, good research and learning spirit, can write well organised and structured reports and publications

Other Activities

- **Co-supervision of two students in a PDR project (Projet de Découvert de Recherche)** *IMT Lille-Douai*
40 hours *2019-2019*
- **ICIRA 2018 PC member**
Program committee member for The 11th International Conference on Intelligent Robotics and Applications, Newcastle, Australia, August 9-11, 2018 *2018-2018*
- **Teaching 2018: Object-Oriented Programming in Java** *IMT Lille-Douai*
Engineering course *2018-2018*
- **2018: Supervision of a master 2 student** *IMT-Lille Douai*
Master degree *2018-2018*
- **IWST 2017 PC member**
Program committee member for the International Workshop on Smalltalk Technologies 2017, Maribor, Slovenia; September August 5th, 2017 *2017-2017*
- **ReConFig 2016 PC member**
Program committee member for International Conference on ReConfigurable Computing and FPGAs, 2016 *2016-2016*
- **Teaching : Object-oriented programming in Pharo / Smalltalk and Java (40 hours)** *IMT Lille-Douai*
Engineering course *2015-2015*

Publications

Dichtl, J., LE, X. S., Lozenguez, G., Fabresse, L., & Bouraqadi, N. (2019). *Robot navigation with polypmap, a polygon-based map format*. In Intelligent systems conference (intellisys). London, UK. **2019**

Dichtl, J., LE, X. S., Lozenguez, G., Fabresse, L., & Bouraqadi, N. (2019). *PolySLAM: a Polygon-based SLAM algorithm*. ICARSC2019: 19th International Conference on Autonomous Robot Systems and Competitions. Porto, Portugal. **2019**.

Xuan Sang LE, Luc Fabresse, Noury Bouraqadi, & Guillaume Lozenguez. (2018). Evaluation of Out-of-the-box ROS 2D SLAMs for Autonomous Exploration of Unknown Indoor Environments. In *The 11th International Conference on Intelligent Robotics and Applications*. ewcastle, Australia, August 9-11, **2018**

Xuan Sang LE, Jean-Christophe Le Lann, Loïc Lagadec, Luc Fabresse, Noury Bouraqadi, and Jannik Laval. Cardin: An agile environment for edge computing on reconfigurable sensor networks. In *the proceedings of The 2016 International Conference on Computational Science and Computational Intelligence (CSCI'16)*, Las Vegas, Nevada, USA, **2016**.

Xuan Sang LE, Luc Fabresse, Jannik Laval, Jean-Christophe Le Lann, Loïc Lagadec, and Noury Bouraqadi. Speeding Up Robot Control Software Through Seamless Integration With FPGA. In *SHARC '16: 11th National Conference on Software and Hardware Architectures for Robots Control*, Brest, France, **2016**.

Xuan Sang LE, Luc Fabresse, Jannik Laval, Jean-Christophe Le Lann, Loïc Lagadec, and Noury Bouraqadi. Dynamic distributed programming on reconfigurable ip-based smart sensor networks. *Presented as poster at 11ème Colloque du GDR SoC-SiP*, France, **2016**.

Xuan Sang LE, Loïc Lagadec, Luc Fabresse, Jannik Laval, and Noury Bouraqadi. A meta model supporting both hardware and smalltalk-based execution of fpga circuits. *IWST '15*, pages 6:1–6:14, **2015**.

Xuan Sang LE, Loïc Lagadec, Luc Fabresse, Jannik Laval, and Noury Bouraqadi. From Smalltalk to Silicon: Towards a methodology to turn Smalltalk code into FPGA. In *IWST 14, Cambridge, United Kingdom*, August **2014**.