

# MARC ANDRÉ LEROY

Robotics Engineer – Microengineering EPFL Graduate

Lausanne area, Switzerland

Personal address, email and phone number upon request, please reach out via LinkedIn  
[linkedin.com/in/marcleroy93](https://www.linkedin.com/in/marcleroy93), [maleroy.github.io](https://maleroy.github.io)



## SUMMARY

Having had a **multidisciplinary** engineering education, my curiosity is attracted by the fields of **robotics**, **control systems** and **aerospace**. I am an open-minded person with **international** experience and my **language skills** suggest assignments in a multinational environment.

## WORK EXPERIENCE

### Pix4D S.A.

Lausanne, Switzerland

*Senior IoT Engineer (initially Hardware Engineer)*

01/2018 – 06/2024

- Developed a solution of distributed, yet synchronized **IoT cameras** for daily construction site mapping, aiding BIM / Construction Site Managers in critical decision-making
- Worked in a small team of 5, handling **diverse tasks** as the product evolved and the business grew (and eventually the team)
- **Integrated** and **fused sensors** (e.g. IMU, GNSS, camera) for **state estimation** using C/C++/Python
- Conducted **mechanical design** using Autodesk Inventor and **PCB development/verification** with KiCAD
- Managed **product manufacturing**, **workshop** and **stock levels**, **business development**, and **pre-sales / customer support** leveraging **language skills**
- Co-designed and implemented **software architecture**, leveraging Balena and AWS frameworks
- With the team growing, focused on **R&D**, improving state estimation algorithms to provide accurate, noise-rejecting data with low-cost sensors to keep the product's cost within its budget
- **Mentored** a graduate student intern in developing an **edge AI algorithm** (TensorFlow Lite) for image quality assessment and data throughput optimization
- Led international certification efforts, achieving approvals for different markets, namely **CE/RED** (EN 301 489, EN 301 908-1, EN 303 413, EN 62311, EN 62368-1, EN 60950-22, EN 60529), **FCC/ISED** (radio and EMC §15B + ICES-003) and **KC**
- **Sole embedded software / firmware engineer** (RTOS, BLE, I<sup>2</sup>C, USB, FUOTA, etc.) of multiple cell phone accessories, enabling reliable inputs for a photogrammetry pipeline

### NASA Ames Research Center

Mountain View, United States of America

*Research Scholar*

02/2017 – 08/2017

- Developed **novel locomotion control algorithms** in the Dynamic Tensegrity Robotics Lab within the Intelligent Robotics Group
- Supported the **manufacturing and testing of a tensegrity robot** that will be used in future NASA missions
- Presented work at the Structurally Adaptive Tensegrity Robots workshop (07/2017) during the NASA/ESA Conference on Adaptive Hardware and Systems held at the Pasadena California Institute of Technology

### Universo S.A. – Swatch Group

La Chaux-de-Fonds, Switzerland

*Warehouseman*

07/2014 – 07/2014

- Completed an internship utilizing Numerical Control (NC) machines, lathes, mills, and drills
- Manufactured and repaired components using various machining tools

### Swiss Armed Forces Command Support Organization

Jassbach and Zimmerwald, Switzerland

*Private First Class Strategic Radio Explorer*

10/2011 – 08/2012

- Fulfilled full military obligations as a Swiss citizen in the Center of Electronic Operations
- Worked with classified equipment
- Instructed new and returning privates on the use of the equipment

## EDUCATION

### Ecole Polytechnique Fédérale de Lausanne (EPFL)

Lausanne, Switzerland

*MSc in Microengineering*

09/2015 – 09/2017

- Major in Robotics and Autonomous Systems, minor in Space Technologies

- Focus on Systems and Control, Manufacturing Engineering, Electronics and Photonics

## SKILLS

- **Robotics and Embedded Systems:** Systems Engineering, Mechanical Design, Kinematics, Dynamics, Linux, Single-board Computers (e.g. BeagleBone, Raspberry Pi, NVIDIA Jetson Nano), Communication Protocols (e.g. Bluetooth Low Energy, TCP, UDP, USB, I<sup>2</sup>C, SPI, UART, GPIO), Microcontrollers (e.g. ESP32, AVR, Nordic, Zephyr, FreeRTOS, RP2040, Arduino, over-the-air firmware updates), Debugging, Actuators, Sensors, Electronics, Signal/Image Processing, Computer Vision, Sensor Fusion, State Estimation, Control, Localization, Navigation, Locomotion, Manipulation, Haptic Interfaces, Machine Learning, Reinforcement Learning
- **Control Systems:** Linear, Nonlinear, Optimal, Adaptive, Model Predictive, Central Pattern Generators
- **Computer-Aided Design and Manufacturing:** SolidWorks, Autodesk Inventor, CATIA, Fusion 360, KiCAD, 3D printing, Soldering
- **Software Development:**
  - *Programming:* C, C++, Python, Bash, Assembly
  - *Scripting & frameworks:* OpenCV, TensorFlow Lite, Matlab, Simulink, Simscape, LabVIEW
  - *IoT, Web & Cloud:* Balena, REST APIs, AWS, MQTT
  - *DevOps:* Git, CMake/Make, Unit Testing, Docker, ELK stack, Jira
- **Productivity:** Markdown, LaTeX, Google Workspace, Microsoft Office Tools

## ACADEMIC PROJECTS

- **Master's thesis:** *Manufacturing, Control and Testing of a Tensegrity Robot for Planetary Landing and Exploration* – Collaboration between **NASA Ames Research Center** and EPFL's **Biorobotics Laboratory**; the innovative results were presented in a conference and in public outreach activities
- **Semester projects:**
  - *CleanSpace One capture system dynamics and design* – Performed reliability simulations to optimize the shape of a satellite's subsystem; results were included in a [publication](#) (co-author) presented at the 2017 International Astronautical Congress in Adelaide, Australia
  - *Model of energetic cost against rough terrain and perturbations* – Conducted a study on how the energy consumption of a biologically inspired exoskeleton could be reduced
  - *Design of an adaptive structure for multirotors to transport packages of different sizes* – Designed and manufactured a modular drone structure that can fit different packages

## LANGUAGES

- **French:** Native language
- **Portuguese:** Native language
- **English:** Native language
- **German:** Advanced (C1)
- **Spanish:** Intermediate (B1)

## ADDITIONAL ACTIVITIES

- Selected participant in two space engineering international workshops:
  - Swiss Space Center (09/2016): built a ground station to receive satellite signals
  - Bauman Moscow State Technical University (07/2016): *Robotics Group Leader* for 8 students
- Part-time **Teaching Assistant** at EPFL (09/2014 – 12/2016) in multiple Analysis courses (BSc-level)
- Member of various **student associations** throughout my education:
  - *MSc in Microengineering Students' representative* (09/2016 – 09/2017)
  - *Treasurer for "Dynamic"* (05/2015 – 06/2016)
  - *Staff Manager at the "LudIC" events* (05/2013 – 06/2016)
- Hobbies: Tennis, Cuban Salsa dance, Windsurfing, music player (drums)

## PERSONAL INFORMATION

31 years old – Married – Father – Swiss and Brazilian dual citizenship – All military obligations already fulfilled