THIBAUD CHUPIN

EMBEDDED SOFTWARE ENGINEER

Embedded software developer with a background in controls theory. I can act as the bridge between the scientists, the engineers, and the managers. If required, I can whip up a simple PCB or mechanical design.

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WORK EXPERIENCE

Embedded Software Engineer February 2024 — September 2025

AAC Hyperion (Netherlands)

As is typical in smaller companies, I wore many hats (embedded software, assembly and integration scripts, devops, ...).

Embedded Software

- Developed embedded software in **C** and **C++** for space hardware and test equipment.
- Drove a migration away from Microchip Studio **Makefile** projects to **CMake** (allowing us to build and test the code in **CI**).
- Re-wrote the core communication library (in **C**), used over **UART** (RS-485), **I2C** and **SPI**, to command our hardware.
- Wrote a code generation tool for serialization and deserialization of message types using **libclang**, targeting **C**, **Python** and **LaTeX** backends.
- Spent too much time with a logic anaylyzer debugging broken hardware.

Assembly, Integration, & Testing

- Set up a **CI** with linting, tests, changelog generation, and automated software releases following SemVer.
- Designed breakout PCBs (in **Kicad**) for hardware interfaces, and 3D printed jigs (**Onshape**) to mount them.
- Wrote a DSL (in **Python**) and REPL to make it easier to develop testing scripts as part of the production process.
- Added documentation generation pipelines(**doxygen**, **Sphinx**) where possible to surface tribal knowledge about projects.

System Administration / DevOps

- Procured, set-up, and maintained the company servers (**Gitlab** & **Gitlab CI** runners, **OpenVPN**, Inventree, Artifactory, ...).
- Responsible for server backups and disaster recovery procedures.

Robotics Engineer July 2022 — January 2024

ESA - Human Robot Interaction Lab (Netherlands)

Staff engineer for the lab. Responsible for software maintenance and development for the robotic systems (300+ kg wheeled platform with two Kuka LWR arms, Boston Dynamics Spot) used for experiments with International Space Station astronauts. I mentored a rotating roster of interns and trainees with wildly varying skill levels.

Robotics & Software

- Primary developer on the software stack (**C++**, **Python**, **Golang**, **Matlab**, **Simulink**) using **DDS** for communication.
- Maintainer of the lab's **Buildroot** image (from Systemd to GUI) through qualification as a payload on the ISS. Also maintainer of the associated **CI** infrastructure.

System & Network Administration

- Maintainer the lab's infrastructure (**Gitlab** build servers, **Minio** S3 cache, **OpenVPN**, **Grafana**, **Telegraf**, **RTK GNSS**) using **Docker** and **Docker Compose**.
- Diagnosed complex IP routing and MTU issues on IP connections between ground and the International Space Station.

Robotics Engineer / Systems Engineer — June 2018 — June 2022

Space Applications Services (Belgium)

Worked as a software and systems engineer on early stage space missions covering satellite rendez-vous systems, rovers, space stations, and in-situ resource utilisation schemes for the Moon.

Robotics & Rovers

- Wrote embedded software and user interfaces for early demonstrations of the HOTDOCK device (C++, CAN, Python).
- Wrote the control software for simulation, tele-operation, joint-level control, navigation, and power management for the LUVMI rover on both the on-board **Linux** computer and micro-controllers (**ROS 1**, **C++**, **Python**, **CAN Bus**, **CANopen**).
- Updated the LUVMI software for the follow-on LUVMI-X rover (video) (**ROS 2**, **RS-422**).
- Implemented a decoder for the **S.Bus** serial protocol to use an RC controller to control the rover.
- Defined software and functional safety architectures for astronaut training devices developed in the team in collaboration with space medicine specialists from DLR (German aerospace agency) and EAC (European Astronaut Centre) for ESA (Esuropean Space Agency).

Systems Engineering

- Systems Engineer for early iterations of an Ethernet switch for deep-space applications working on the definition of electrical and mechanical interfaces.
- Lead systems engineer for avionics and mobility systems on the Flight Model design of the LUVMI-X rover and the demonstration model.

Image Processing / Machine Vision

- Developed a robust multi-marker visual tracking system using a custom fork of an **ArUco** marker tracking library for on-orbit servicing applications (**C++**, **OpenCV**, **Eigen**). Data post-processing scripts written in **Python** with **NumPy**.
- Validated performance of the system on a large robotic simulator.

Research Fellow @ Nearlab — Oct 2016 — June 2018

Politecnico di Milano (Italy)

At Nearlab I was the resident daVinci Surgical System expert, working with the research team developing augmented reality tools for surgeons (**C++**, **Python**, **OpenCV**, **PCL**, **ROS 1**) and working on camera/robot calibration.

EDUCATION

Automation & Control Engineering MSc.

Politecnico di Milano (Italy)

Undergraduate and graduate degrees focused on control theory and mechanics.
For my Master's thesis I developed a data-driven attitude controller for a quad-copter that significantly improved response time and stability margin compared to the previous state-of-the-art controller.

SKILLS

Programming	C · C++ · CMake · Rust · Python · Lua · elisp · Bash / Sh
Lint & Test	Gitlab CI · Black · Flake8 & Ruff · MyPy · PyTest · Clang-Format & Clang Tidy · CTest
Libraries	Eigen · NumPy · Qt & PySide · Atmel Software Framework (ASF 3)
Robotics Tools	ROS (1 & 2) · DDS (RTI Connext DDS) · OpenCV · Matlab/Simulink ·

Rapid Prototyping	FreeCAD, Solidworks & Onshape · 3D Printing · Basic CNC Machining
Protocols	CAN · CANOpen (with DS301, DS402) · EIA/TIA-422 & 485 · SPI · I2C
Languages	French (Native) · English (Fluent - C2) · Italian (Fluent - C2)