# Sacha **BELLIER**

Master 2 - Embedded Software Engineer

## Personal Information

👤 Sacha BELLIER

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🚗 Driving License

## Languages

I French
I English

## Skils

I Modern C++ | C++20
I Embedded C
I git
I bash | python | lua
I STM32 | stlink | gdb-multiarch
I gdb | sanitizer | clang-format/tidy
I Latex | Markdown
I Linux | Windows | WSL

## Build / Remote / CI

I Bazel
I Buildkite |  BuildBuddy
I Github Workflows | Gitlab CI
I Docker
I Premake | CMake

## Tools

I VSCode | Visual Studio
I Github
I Jira | Bitbucket
I STM32CubeMX | PlatformIO
I PCB: KiCad
I CAD: Fusion360

## Hobbies/Associative

I Aeromodelling | FPV Drone
I FabLab | DIY for Escape-game
I Electronics | DIY
I 3D Printing | CNC

# Profil

I am a creative person, passionate about flight systems, looking to work within a dynamic team.  Always ready to learn new things and take initiative, I am keen to participate in a project that brings together many fields of engineering.
Currently finishing my end-of-studies internship, I will be available from the **beginning of September 2024**.

# Professional experiences

**2024**

**Thales**
**Simulation of Guidance and Control**
End-of-Studies Internship · Élancourt 📍

 A **C++14** project used as test bench. Generation of realistic trajectories, using the **Eigen** library, in the **WGS84** coordinate system.

**Initiative**:  Setup and presentation of  **Bazel**  with  **Remote Build/Cache**  on **Bazel-BuildFarm**.
Integration with RedHat's devtools and the project's own toolchain.

**2023**

**KRONO-SAFE**
**Real-time Control of a Robot Arm**
End-of-Studies Project · Paris 📍

 Project based on a **Zynq UltraScale+** development board.  Developed in PsyC, a real-time language.  Creation of **Timing windows** validated through simulation to guarantee **real-time** and **determinism**.
Development of a custom **I2C driver** to interface a PWM extension card. Receiving Gcode commands via **UART**.

**2022**

**CNRS, Digital Holography Foundation**
**Real-time eye Holography, CUDA**
Intern - 6 months · Paris 📍

 A **C++17** and **CUDA** program to process an hologram in real-time.
Use of parallel computing and asynchronous execution.
The UI was made using **Qt4**.

# Degree

**2019 - 2024**

**Master's Degree - Computer Engineering**
Epita, Paris, France 📍

**2021**

**Erasmus semester abroad**
Vilnius Gediminas Technical University, Vilnius, Lithuania 📍

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## PERSONNAL PROJECTS  ( O-SACHA)

| | |
|---|---|
| **Entity Component System** | **C++20 requires/concepts**<br>Template-Metaprogramming / Static, Dynamic Polymorphism<br>C++ Iterators<br>**Bazel**: Build / Test<br>**CI: Github Workflows, Buildkite, and Buildbuddy**<br>**Remote Build: Buildkite and Buildbuddy** |
| **Templated String Serializer** | **C++20 requires/concepts**<br>Template-Metaprogramming / Static Polymorphism<br>Design Patterns (Factory, CRTP, Strategy, ...)<br>**Bazel**: Build / Test<br>**CI: Github Workflows, Buildkite, and Buildbuddy**<br>**Remote Build: Buildkite and Buildbuddy** |
| **Redaction: IMU and Kalman Filter** | **Embedded C / C++20** on **STM32**<br>**Kalman Filter** made on Eigen.<br>**I2C** to interact with an **IMU**; **UART** for telemetry.<br>Hardware Timer based software. |
| **Self-balancing robot** | **Embedded C / C++20** on **STM32**<br>**PID controller** and Filters (**Kalman**, Low Pass) made on Eigen.<br>**I2C** to interact with an **IMU**.<br>Hardware Timer / Interrupt based software.<br>**Bazel**: Build with an **arm-none-eabi** toolchain |
| **CPU Raytracer / Game Engine** | **C++20**<br>OpenGL / GLSL, ImGui, GLFW<br>math using glm<br>Design Patterns (Abstract Factory, Strategy, Singleton, ...)<br>Compiled using Visual Studio and Premake. |