

## Theo Guegan

Robotics Software Engineer - Internship

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## SUMMARY

Engineering student with strong expertise in C++, Python, and Rust for embedded systems, real-time control, and robotics. Proven ability in developing and integrating complex software for autonomous vehicles and drones, with hands-on experience in simulation and on-hardware validation. Seeking a Robotics Software Engineer Internship to contribute to innovative projects.

## SKILLS

**Programming:** C++ (14/17/20), C, Python, Rust, MATLAB, Bash, Lua, Go

**Robotics Software:** Controls, Kinematics, Motion Planning, Real-time Systems, ROS/ROS2, Behavior Trees

**Embedded Systems:** Embedded Linux, Cross-compilation, Multithreading, FreeRTOS, HAL, UART/I2C/SPI, Low-level Debugging, CAN/Ethernet, Computer vision

**System Tools:** Git, Linux systems, CMake, Makefile, Docker, Test Automation

**Simulation & HIL:** Gazebo (ROS/Robotics), Simulation/Hardware Validation

## PROFESIONNAL EXPERIENCE

### Autonomous Vehicle Control Lead

Feb 2024 – Jun 2025

UTonome

UTAC Challenge

- Designed and implemented **target-based navigation**, adaptive cruise control (ACC), and **obstacle avoidance** algorithms in **MATLAB**, achieving 99% safety in simulation.
- Collaborated on real-time system integration, porting the control system to a Renault Zoe using **Python** and **ROS** for **on-hardware validation** and testing.
- Led development of an autonomous navigation stack, applying advanced controls and robotics principles to secure 1st School Award (2024) and Open Category (2025).

### Embedded Drone Software Engineer Intern

Sep 2024 – Feb 2025

Thales Land & Air Systems

Vélizy-Villacoublay, France

- Architected a **real-time embedded** Lua scripting engine in modern **C++** (TDD) for on-drone customization, reducing mission prototyping time by 4x.
- Streamlined build processes using **Makefiles** and an **Alchemy build system** for efficient **cross-compilation** and deployment to **embedded Linux** targets.
- Integrated a local LLM using **Rust** and **Docker** for natural-language drone commands, achieving 85% accuracy and demonstrating advanced system integration.
- Contributed to **hardware/software debugging** in a lab environment and validated system behavior in real-world scenarios, including a high-profile live demo.

## EDUCATION

### Université de Technologie de Compiègne (UTC)

Sep 2021 – Jun 2026

Master's Degree in Computer Science - GPA 4.0/4.0

Compiègne, France

Specialization: Embedded Computing, Autonomous Systems

Coursework: Robotics Control, Embedded Systems, Autonomy, Kinematics

### University of Waterloo

Sep 2025 – Dec 2025

Exchange Student - Computer Engineering

Waterloo, Canada

Courses: SYDE577 (Deep Learning), SYDE575 (Image Processing), ECE358 (Computer Networks)

## PROJECTS

### Real-Time Kernel (RTOS)

2025

- Designed a preemptive **RTOS** on **STM32H747I-DISCO** with mutexes, semaphores, and priority inversion handling.
- Implemented both with **stm32-hal** in Rust and in pure **C** for bare-metal control, demonstrating deep embedded systems understanding.

### LeRobot: Teleoperated Robotic Arm

2025

- Built dual-arm robotic system achieving 80% task success at 50 Hz with  $\pi 0$  general **VLA**.
- Explored **reinforcement** and **imitation** learning (**PyTorch**, HuggingFace) for teleoperation.

### FIT Coding Challenge

Bosnia-Herzegovina, 2025

- Solved advanced algorithmic problems under time constraints using **C++**, demonstrating strong problem-solving skills relevant to robotics.