**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 4×.
- 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.