

# THEO GUEGAN

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## SKILLS

**Programming:** C/C++, Python, Rust, MATLAB, Bash, Lua, Go

**Embedded Systems:** Embedded Linux, Multithreading, HAL, UART/I2C/SPI, CAN, HITL Debugging

**Robotics:** RTOS, ROS/ROS2, Behavior Trees, Computer Vision, Gazebo, MuJoCo, Gymnasium

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

**AI/ML:** PyTorch, Deep Learning, RL, Imitation Learning, Supervised Learning

## EDUCATION

**Université de Technologie de Compiègne (UTC)**

**Compiègne, France**

Master's of Science, Computer Science

Sep 2021 – Jun 2026

- Specialization: Embedded Computing, Autonomous Systems
- GPA: 4.0/4.0
- Coursework: Robotics Control, Embedded Systems, Autonomy, Kinematics

**University of Waterloo**

**Waterloo, Canada**

Exchange Student - Computer Engineering,

Sep 2025 – Dec 2025

- Coursework: Deep Learning, Image Processing, Computer Networks

## EXPERIENCE

**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 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 and validated system behavior in real-world scenarios, including a high-profile live demo.

**Autonomous Vehicle Control Lead**

**Feb 2024 – Jun 2025**

UTonome – UTAC Challenge

*Compiègne, France*

- Designed and implemented target-based navigation, adaptive cruise control, and obstacle avoidance algorithms in MATLAB, achieving 99% safety in simulation.
- Led system integration, porting control software to a Renault Zoe using Python and ROS for on-hardware validation and testing.
- Directed the development of an autonomous navigation stack that secured 1st School Award (2024) and Open Category (2025).

## PROJECTS

**Neural Surrogate for Model Predictive Control**

- Developed a neural surrogate for MPC comparing SVMs, MLPs, and RNNs to approximate optimal control policies.
- Benchmarked against RL baselines using RMSE, tracking error, constraint violations, and real-time feasibility.

**Real-Time Kernel (RTOS)**

- Built a preemptive RTOS on STM32H747I-DISCO with mutexes, semaphores, and priority inversion handling.
- Implemented both in Rust (stm32-hal) and C for bare-metal control, showcasing deep embedded systems expertise.

**LeRobot: Teleoperated Robotic Arm**

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