

MARIE CHERON

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Automotive Mechatronics & Embedded Systems Engineer



PERSONAL STATEMENT

Control Engineer with an MSc in Automotive Mechatronics from Cranfield University and a Master of Engineering in Autonomous and Connected Mobile Embedded Systems from ESIGELEC, completed through a double-degree programme. Experienced in model predictive control, vehicle dynamics, state estimation, optimisation, real-time implementation and embedded systems, with applications in chassis control and autonomous racing. Seeking to apply strong modelling, simulation and control expertise to the development of high-fidelity real-time and HIL systems within the motorsport industry.

KEY ACHIEVEMENTS

- **Individual Research Project proposed by RIMAC Technology (2026):** Developed and validated a learning-based NMPC framework for longitudinal chassis control of AWD electric vehicles, designed for real-time applications.
- **A2RL Autonomous Racing Project (2025):** Completed a 13-week academic and research programme developing and testing PID, LMPC and reinforcement-learning controllers in simulation, targeting real-time implementation on an autonomous Super Formula car.
- **Simulation and Modelling Engineer for Cranfield's Kia Niro EV Project (2026):** Collected, decoded and analysed 23 signals from MCU diagnostic data, raw CAN frames and OXTS measurements, then developed and validated six vehicle-state estimators using test data.
- **Winner of the UTAC Challenge 2026:** Coordinated the integration of our Kia Niro EV project with the Connected and Autonomous Vehicle Engineering team's work, contributing to the delivery of a complete autonomous mobility solution.
- **Winner of the 2025 Normandy Edition of Innovatech Challenge (Organised by Elles Bougent):** Led the design of a 3-robot autonomous squad for rescue and intervention in hazardous environments.

EDUCATION

MSc in Automotive Mechatronics, Cranfield University, Cranfield, UK September 2025 - September 2026

- **Modules:** Advanced Control and Optimisation | Automotive Control and Simulation | Embedded Vehicle Control Systems | Mechatronics Modelling for Vehicle Systems | Vehicle Control Applications | Vehicle Design, Propulsion and Performance | Vehicle Dynamics | Vehicle Electrification and Hybridisation.

Master of Engineering in Autonomous and Connected Mobile Embedded Systems, ESIGELEC, Rouen, France September 2021 - September 2026

- **Modules:** Automatic Control Engineering for energy and signal processing | Circuit Board Design and Creation | Computer Vision | Cybersecurity | Embedded Linux and Real-time | Engineering Science | Fundamentals of Systems Approach | I.T. networks and operating systems | LabVIEW/Instrumentation and Systems | Mathematics (Algebra, Analysis) | Microprocessor Architecture | Physics (Electricity, Optics, Mechanics, Thermodynamics, Electromagnetics) | Tools and Methods for Software | Wired Communication Buses.

CAREER HISTORY

ESIGELEC / IRSEEM, Rouen, France, Embedded Systems Robotics Technician June 2025 - July 2025

Graduate School of Engineering / Embedded Electronic Systems Research Institute, in collaboration with the startup Aladin Innovation.

- Completed a two-month internship at ESIGELEC as a direct continuation of a five-week academic project for the Abu Dhabi Autonomous Racing League (A2RL) Challenge.
- Tested and optimised in simulation a controller for an autonomous Super Formula car, conducting more than 100 simulation runs to evaluate and validate the code.
- Developed and tested PID, learning MPC and reinforcement-learning approaches for autonomous-vehicle trajectory tracking across the combined five-week academic project and eight-week internship.
- Developed a Unity-based reinforcement-learning environment and completed over 50 training runs, with individual runs executing continuously for between 5 and 50 hours.

- Completed a 1-month internship at Renault Cleon (now Ampere) in the foundry department, gaining hands-on experience in industrial maintenance and production processes.
- Collaborated with a team of 20 engineers, technicians, and operators to maintain and inspect machinery used for electric motor production, improving uptime and process reliability.
- Performed a 20-page safety analysis of operating conditions, proposing ergonomic improvements to reduce accident risks in the maintenance area.

MSC ACADEMIC PROJECTS

Learning-Based Model Predictive Control Framework for Chassis Control, Cranfield, UK, Control & Vehicle Dynamics Engineer

May 2026 - September 2026

- Developed a learning-based NMPC framework for longitudinal chassis control, progressively implementing Point-Mass, Single-Wheel and 16-state AWD EV models together with their OCP and closed-loop control formulations.
- Implemented and benchmarked multiple optimisation, control and learning approaches in MATLAB/Simulink using CasADi, IPOPT and acados, including NMPC, Gaussian Process residual learning, EKF friction estimation and bounded RLS adaptation.
- Built a modular simulation and validation environment combining robustness and Monte Carlo testing across 3 AWD EV parametrisations and 2 longitudinal applications, alongside real-time deployment of the Single-Wheel NMPC on dSPACE.

Kia Niro EV Modelling, Control & State Estimation, Cranfield, UK, Simulation, Modelling and State Estimation Engineer

February 2026 - April 2026

- Collaborated in a 9-student MSc engineering team on the modelling and optimisation of an electric Kia Niro, then focused on Sensors and State Estimation within a 4-student subgroup.
- Collected, decoded and analysed 23 vehicle signals from MCU diagnostic data, raw CAN frames and OXTS measurements, including battery, pedal, steering, speed, RPM and vehicle-motion data.
- Developed and validated 6 estimators for payload mass, road gradient, tyre-road friction coefficient and battery states (SoC, SoP and SoH) using vehicle test data in a CarMaker/Simulink co-simulation environment.

Abu Dhabi Autonomous Racing League Project (A2RL), Rouen, France, Simulation Engineer

April 2025 - May 2025

- Collaborated within a team of 8 students on a 5-week academic project for the Abu Dhabi Autonomous Racing League (A2RL) Challenge, as part of the 2nd year of the engineering degree, focusing on autonomous racing technologies.
- Optimised and documented a Unity-based simulation environment for testing autonomous driving algorithms over 3 weeks, improving usability and reliability for future developments.
- Wrote a 45-page final project report to ensure a smooth handover and continuity for the next student team.

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Language Skills:** Native French speaker, fluent in English, basic communication skills in Spanish.
- **Technical Skills:**
 - **Control, Modelling & Simulation:** MATLAB, Simulink, Simscape, Modelica, Dymola, CarMaker, CasADi, acados, dSPACE and Unity.
 - **Programming:** Java, SQL, Python, C, C#, C++, JavaScript, HTML, CSS and Git.
 - **Embedded Systems, Robotics & Electronics:** Vehicle ECU data acquisition, CAN signal decoding, sensor data analysis, LabVIEW instrumentation, ROS 2 (Python/C++), real-time programming on Linux, Arduino, MSP430, and PCB design using EAGLE and OrCAD.
 - **Engineering & Project Tools:** Microsoft Word, Excel, PowerPoint, Teams and Project.
- **Interests:** 13 years of figure skating, 5 years of climbing, practising visual arts, and reading.
- **Leadership & Societies:** Head of Sponsorships and Partnerships at the Students' Sports Office (BDS), ESIGELEC (2024-2025); Vice President of the BRIGADE (Supporters' Association), ESIGELEC (2024-2025); Member of the Decorations Team for the ESIGELEC Gala (2024 & 2025); Secretary of the Bureau des Saveurs (Cooking Association), ESIGELEC (2024-2025); and Co-Founder and Treasurer of the Motorsport Society, Cranfield University (2025-2026).