MARTÍN TOUS

M.Sc. Mechatronics Engineer · Embedded Systems & Robotics · Industrial Product Development

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Professional Summary

Mechatronics engineer with hands-on experience across the full product development lifecycle — from concept and prototyping through to mass production. Currently leading electrical accessory development at Toyota Motor Europe (Brussels), working entirely in English in a multinational environment. Background spans embedded firmware, computer vision, robotics, and cross-functional supplier management. EU citizen available to relocate to Switzerland without visa or permit constraints.

Work Experience

Product Development Engineer — Aug 2024 – Present

Toyota Motor Europe · via ALTEN Belgium · Brussels, Belgium (Hybrid) · Working language: English

- Own the full product development lifecycle for **3+ electrical accessory lines** across multiple vehicle platforms — feasibility, prototyping through to mass production — coordinating cross-functional teams across engineering, supplier, and production stakeholders.
- 3D wire-harness and part design in **CATIA V5**; produced electrical wiring diagrams (EWD); conducted prototype fit checks and fire-hazard assessments on **10+ prototype iterations**.
- Coordinated supplier validation campaigns; executed **FMEA/DRBFM** analyses and resolved inline-installability issues — streamlined sign-off documentation, significantly reducing supplier validation back-and-forth cycles.

Artificial Vision / Computer Vision Engineer — 2023 – 2024

ANT Automation · Buenos Aires, Argentina (Remote)

- Developed computer vision inspection modules deployed across multiple production lines; implemented image-processing pipelines achieving **~94% classification accuracy** on industrial part recognition tasks.
- Integrated vision systems with hardware (cameras, sensors, PLCs and control systems); automated defect detection replaced manual inspection on target lines, freeing operator capacity for higher-value tasks.

Robotics Teacher — 2023

Queen Mary High School

- Designed and led hands-on robotics workshops for 20+ high school students; covered embedded systems fundamentals, sensor integration, and basic control concepts.

Founder & Engineer — MT3D Print — 2020 – 2023

Self-employed · 3D printing & product prototyping

- End-to-end product prototyping for **50+ clients**: mechanical design (SolidWorks / Fusion 360), electronics, firmware, and production of custom 3D-printed parts.

Key Academic & Personal Projects

Full descriptions, videos & code: martintous.com/projects

Gesture-Controlled Mobile Robot with Robotic Arm — *ATmega328P, Arduino, C, servos, UART/I2C*

- Designed electronics and firmware for a mobile robot with two-axis gripper; implemented motor control and UART/I2C sensor communication; delivered a working pick-and-place prototype.

Robotic Arm Trajectory Planning & Implementation — *MATLAB (Peter Corke toolbox), Python, Arduino/C++*

- Computed forward/inverse kinematics and simulated linear trajectories; implemented and validated on a 5-DOF prototype.

Computer Vision for Object Recognition & Measurement — *MATLAB, Python, machine learning*

- Built a full pipeline recognising industrial parts (washers, nuts, screws) and estimating dimensions; 94% test accuracy, ~1 mm length measurement error.

3D Printer — Design & Build from Scratch — *Arduino, stepper motor control, mechanical design, firmware*

- Designed and assembled a complete FDM printer (mechanical frame, electronics, firmware); iteratively tuned hardware/software across multiple prototypes.

Quadcopter Control System Modelling — *MATLAB/Simulink, control systems, signal processing*

- Modelled quadcopter flight dynamics and control in MATLAB/Simulink; simulated sensor data acquisition with noise to evaluate controller robustness.

Skills

CAD & Simulation	SolidWorks, NX, CATIA V5, Solid Edge, Fusion 360, AutoCAD, Webots, Unity
Programming	C, C++, Python (OOP), MATLAB / Simulink / Stateflow, PLC (Ladder, FBD, ST)
Embedded Systems	AVR (ATmega), ARM basics, Arduino; microcontroller firmware, UART/I2C, motor control (DC / stepper / servo)
Electronics	Analog & digital circuit design, power electronics, wiring harness routing, EWD/wiring diagrams; multimeter & oscilloscope
Robotics & Control	Kinematic & dynamic analysis (serial, mobile, parallel), control system modelling, trajectory planning, sensor integration
Tools & Workflow	Git, Linux, Microsoft Office, FMEA/DRBFM, test lab coordination, basic PCB prototyping
Soft Skills	Cross-functional coordination · Technical communication · Leadership · Autonomous problem-solver · Meticulous

Education

M.Sc. Mechatronics Engineering — Cuyo National University, Mendoza, Argentina · Mar 2018 – Feb 2024 · GPA: **8.92 / 10**

Languages

Spanish	Native
English	B2 — Professional working proficiency (sole working language at Toyota Motor Europe)
French	A2 — Elementary proficiency
German	Beginner — actively studying