Ángel García Garrido

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Mechanical engineer completing a Master of Science at Embry-Riddle. Graduate researcher in 6-DOF Exterior Ballistics: two papers accepted at the 35th International Symposium on Ballistics and trajectory software tested in about ten live-fire sessions. Background in mechanical design and FEA, embedded control, and 3D piping modeling and drawings for a heat plant.

EDUCATION

Embry-Riddle Aeronautical University — Daytona Beach, FL
Master of Science in Mechanical Engineering — Dec 2026
Coursework: Autonomous Vehicles, Modern Control Systems, FEM — GPA: 3.85/4.00

Universidad Pontificia Comillas (ICAI) — Madrid, Spain
Master of Science in Industrial Engineering (dual degree with Embry-Riddle) — Aug 2027
Bachelor's in Engineering and Industrial Technologies — May 2024

RESEARCH & PUBLICATIONS

- **Á. García**, J.-M. Dhainaut. "External Ballistics: Quantifying the Contribution of Individual Aerodynamic Effects in 6DOF Trajectory Prediction." 35th International Symposium on Ballistics, Cape Town, South Africa, Oct 2026 (accepted).
- **Á. García**, J.-M. Dhainaut. "External Ballistics: A Closed-Form Approximation of Lift-Induced Trajectory Deviations for Spin-Stabilized Projectiles." 35th International Symposium on Ballistics, Cape Town, South Africa, Oct 2026 (accepted).
- Third paper in preparation.

TECHNICAL SKILLS

- **Simulation & Analysis:** 6-DOF flight dynamics, numerical integration (RK4), Monte Carlo and sensitivity analysis, MATLAB/Simulink, ANSYS (incl. thermal FEA), Fluent, SolidWorks Simulation, CYPE, EES
- **Programming:** Python (NumPy, SciPy, PyTorch, OpenCV, PySide6), C (embedded), JavaScript/Electron, R
- **CAD & Office:** SolidWorks, Siemens NX (incl. CAM), Solid Edge, AutoCAD, Fusion 360, Intergraph Smart 3D, Microsoft Office
- **Controls & Hardware:** PID and state-space control, Kalman filtering, microcontrollers (dsPIC), ABB RobotStudio, 3D printing, mechanical and electronic assembly
- **Languages:** Spanish (native)

PROFESSIONAL EXPERIENCE

Embry-Riddle Aeronautical University — Daytona Beach, FL
Graduate Researcher, Exterior Ballistics — Sep 2025 – Present

- Extended an earlier Embry-Riddle MATLAB 6-DOF solver to isolate each aerodynamic effect on a 7.62 mm round: at 1,000 m, drop is 54% gravity, 46% drag; spin drift is 79% of still-air drift.
- Developed a closed-form lift model that reproduces about 97% of the lift-induced deviation and returns a prediction in about 4 µs, versus 9–13 s for a full 6-DOF run.
- Built the Superior Ballistics software on the solver: a Python/Electron desktop app (Monte Carlo hit probability, muzzle-velocity and ballistic-coefficient truing, sensitivity analysis, 3D views), a JavaScript field web app (live at ballistics.emafd.com; App Store release planned) and a 3D range simulator.
- Tested predictions and usability in about ten live-fire sessions; one documented session fit elevation to 0.10 mrad RMS at 307–681 yd (muzzle velocity trued).

Embry-Riddle Aeronautical University Daytona Beach, FL

Drone Detection Research, SkyTracker Lab Sep 2026 – Present

- Developing an early-stage passive system in which camera drones detect, track and locate another drone in 3D: moving-camera detection, camera pose and timing, multi-view Kalman tracking; tested in simulation and on public datasets, nothing flown yet (Python, PyTorch, OpenCV).

Grader & Teaching Assistant Jan 2026 – Present

- Grade assignments every term since spring 2026 for AE 418, ME 400 and ME 501 (aerospace structures, vibrations, modeling methods): 130+ submissions so far in fall 2026, with rubrics and written feedback.
- Prepared and gave one ME 400 lecture on equivalent springs in summer 2026 (seven worked problems).

Empresarios Agrupados (EAG) – GHESA Madrid, Spain

Junior Mechanical Engineer Intern, Mechanical Design Dept. Jun 2024 – Sep 2024

- Modeled piping and pipe supports in Hexagon Intergraph Smart 3D and produced 500+ drawings from the model for a heat plant in North London.
- Performed quality control and modified existing pipe supports to keep pace with construction on site.

Institute for Research in Technology (IIT), Comillas ICAI – Chair of Energy and Poverty Madrid, Spain

Big Data & Energy Analyst (Research Assistant) May 2022 – Nov 2023

- Built energy-poverty indices from National Statistics Institute (INE) data covering 700,000+ Spanish citizens, for research the IIT was preparing for the European Commission.
- Wrote R pattern-recognition programs, drew flow diagrams with 400+ nodes and helped draft reports.

PROJECTS

Autonomous Light-Tracking Counter-Drone Turret ICAI, Oct 2024 – Dec 2024

- Team of three, graded 10/10: a dsPIC33 turret that tracks a light source with four IR photodiodes and proportional pan-tilt control, ranges it ultrasonically and fires a compressed-air dart after a 2 s warning.
- Designed all the analog electronics (op-amp transimpedance stages for the photodiodes), wrote part of the C firmware and modeled parts in Solid Edge for 3D printing.

Modular E-Bike Charging Locker: Design Study (Bachelor's Thesis) ICAI, Jan 2024 – Aug 2024

- For micromobility company Don Cicleto, graded 9/10: a four-bay locker module sized to one car parking space, with Bluetooth electromechanical locks and solar, grid and hybrid electrical schemes.
- Designed the welded 6061-aluminum frame of the 176.5 kg module and verified it in SolidWorks FEA: 3.7 mm maximum deformation and a safety factor of about 10 against 6061-T6 yield.
- Sized the door's 310 N gas strut; costed the module at about €2,600 in parts plus €500–1,000 to install.

Simulated Autonomous Surface Vessel Embry-Riddle, Aug 2025 – Dec 2025

- Individual ME 503 coursework, built over weekly assignments: MATLAB autonomy for a simulated boat with GPS, camera and LiDAR; final project graded 10/10 (1,000 points, every mission completed).

LEADERSHIP & INVOLVEMENT

- **ICAI Speed Club, Formula Student** (Oct 2022 – Dec 2022), Cooling: radiator sizing, test-bench design.
- **ICAI Speed Club, MotoStudent** (Oct 2023 – Apr 2024), Mechanical Design: triple clamps, part of the cooling system and the carbon-fiber manufacturing procedure; sourced carbon fiber and an autoclave.
- **SHPE**: Member, IT Committee (Aug 2025 – Nov 2025); attended the 2025 National Convention.
- **Volunteer**: Robotics workshops and swimming for people with Down syndrome (Jan 2024 – Apr 2024).