

# Gonzalo Ferrero Martín

Electrical Engineering student – hardware and software.

| Email                           | Portfolio            | Links                                               | Based          |
|---------------------------------|----------------------|-----------------------------------------------------|----------------|
| g.ferrero.martin@student.tue.nl | gonnzalofr.github.io | github.com/gonnzalofr<br>linkedin.com/in/gonnzalofr | Eindhoven · NL |

## Education

|                        |                                                                                                                                                        |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sep 2025 –<br>Jul 2028 | <b>Eindhoven University of Technology (TU/e)</b><br>Eindhoven – BSc Electrical Engineering, expected July 2028. First-year weighted average 9.58 / 10. |
| Sep 2024 –<br>Jun 2025 | <b>Harrison High School</b><br>Harrison, New York – Graduated Summa Cum Laude. ACT 35.                                                                 |
| Sep 2023 –<br>Jun 2024 | <b>Humanitas Bilingual School</b><br>Tres Cantos, Madrid – Honorable mentions in Mathematics, Physics, and Chemistry.                                  |

## Projects

|                        |                                                                                                                                                                                                                                                                                                                                                                                                                      |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Jul 2026 –<br>present  | <b>HDMI / DVI transmitter – Verilog on PYNQ-Z2 (Zynq-7020)</b><br>Personal project. A DVI pipeline from scratch: 640×480 timing, pattern generator and TMDS 8b/10b encoder, verified by self-checking XSIM testbenches – an independent decoder on every symbol, a full frame dumped to a PPM file and seven timing counts checked against constants. Serializer and board bring-up in progress.                     |
| May 2026 –<br>Oct 2026 | <b>Battery-powered HiFi music player – PCB design</b><br>Personal design study, not built. Schematic capture, 4-layer PCB layout in three revisions and power path around an ESP32-S3R8; audio from Bluetooth or microSD through a MUX into an I2S DAC.                                                                                                                                                              |
| 2026                   | <b>Venus rover – autonomous dual-robot firmware, TU/e 5EID0</b><br>Run-on-boot C firmware for a PYNQ-Z2 rover: hunts colored cubes with three VL53L0X ToF sensors, dead-reckons its position, shares finds with a partner robot over MQTT (UART → ESP32 → broker); four-state autopilot, boundary-evade interrupt, 6-read burst vote on every detection. Also the Python mission-control relay, logger and live map. |
| 2025 – 2026            | <b>Rock Your Baby – distributed baby-monitoring cradle, TU/e 5EWC0</b><br>Four PYNQ-Z2 subsystems in C talking over UART – heartbeat, crying, decision-making, actuator: ADC sampling, an adaptive exponential filter and RMS with noise-floor subtraction, pthreads, two PWM channels for the rocking motion.                                                                                                       |

## Experience

|                           |                                                                                                                                                                                                                                                                                           |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sep 2026 –<br>Jun 2027    | <b>Student Mentor, First-Year Electrical Engineering</b><br>TU/e – current. Selected to guide incoming Electrical Engineering students through coursework and the transition to university.                                                                                               |
| Apr 2027 –<br>Jul 2027    | <b>Student Assistant &amp; Course Reviewer, Communication 1</b><br>TU/e – upcoming. Selected as one of two students to review and catalog the course's content and support the lab sessions.                                                                                              |
| Jan 2026 –<br>14 Oct 2026 | <b>Electrical Engineer, Student Team Daedalus</b><br>Student Team Daedalus, TU/e – a solar-powered autonomous aircraft for wildfire surveillance. PCB design, embedded programming and bench verification of the aircraft's electronics, in the Electrical / Embedded Systems department. |

## Skills

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|--------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| HDL & code                                                                                                                                 | Verilog, C, Python, MATLAB, engineering mathematics.                                               |
| Tools                                                                                                                                      | Vivado, XSIM, Verilator, Altium, KiCad, EasyEDA, LTspice.                                          |
| Hardware                                                                                                                                   | Analog and digital circuit design, 4-layer PCB layout, embedded systems, bring-up and bench debug. |
| PYNQ-Z2 (Zynq-7020) · ESP32 / ESP32-S3R8 · VL53L0X ToF · TCS3200 color sensor · TCRT5000 IR · NTC thermistors · stepper drivers · I2S DACs |                                                                                                    |

## Languages

|             |                                                                                |
|-------------|--------------------------------------------------------------------------------|
| Spoken      | Spanish, native · English, fluent · French, B1                                 |
| Citizenship | Spanish and French (EU) · authorized to work in the United States through 2028 |