Miguel Laredo Barbadillo 2002

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Computer Science Student
Formal Methods | Software Verification | Mathematics

Education

Universidad Politécnica de Madrid *(September 2025 – Present)*
PhD in Computer Science and Technologies

Universidad Complutense & Politécnica de Madrid *(September 2024 – September 2025)*
Master's degree in Formal Methods in Computer Science and Engineering

Universidad Politécnica de Madrid *(September 2021 – July 2024)*
Bachelor's degree in Computer Engineering

Experience

ETSI Sistemas Informáticos | *PhD in Computer Science and Technologies (September 2025 – Present)*

- Co-directing multiple final degree projects originating from my own proposals.

Ventor Innovations | *Part-time Flight Test Supervision for UAS (February 2023 – January 2024)*

- In charge of aircraft digital video feed using *uv4l*, *ffmpeg*, *GStreamer* and *Python*.
- Developed a first approximation to onboard real-time bird detection using convolutional neural networks in *PyTorch*, specifically single-shot detectors such as *YOLO*.
- Implemented real-time aircraft horizon awareness using classic segmentation methods and flight telemetry, using *OpenCV* in *C++*.

Playedu | *Teacher* (February – June 2022)
Conducted group reinforcement lessons in Physics and Mathematics at Nuestra Señora de las Nieves School, teaching classes of 20 or more students aged 13 to 16.

Freelance | *Private Tutor* (2021 – Present)
Private tutoring for students, mainly in Mathematics, Physics, and Programming.

Framenet3 | *Introductory Internship, 4th ESO + Empresa 2017*
Computer assembly.

Projects

Type Theory and Categorical Models: A Unified Approach | *Literature Review*
Link between *Type Theory* and *Category Theory*, exploring the *Curry-Howard-Lambek* correspondence and implementing key constructions in *Haskell*.

Ray-Net | *AI enhaced Real-Time Ray Tracing Engine*
Minimalistic Real-time Ray Tracing Engine enhaced by *FSRGAN* network to improve performance as part of my final degree project.

PointlessOS | *Proto-OS*
32-bit bootable Operating System for x86 architectures, showcasing familiarity with processor design and lower level toolchains.

Languages

Spanish: Native
English: C1 Cambridge
French: A2-B1

Licenses and Certificates

Driver's License | *Class B (Spain, 2022)*

Skills and Interests

Soft Skills: Synergistic self-directed learner with an inquisitive mindset.
Expertise: Programming languages, type theory and formal methods.
Interests: Swimming, endurance sports and origami.

Taking mathematics courses at UNED toward the Mathematics degree.