

Edgar CASTA

R&D Engineer — Optronics

- **7 years of experience**
- **Immediately available**
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- **Address:** Paris

Technical skills:

- **R&D**
- **Optics**
- **Electronics**
- **Programming**

Professional Experience

R&D Engineer

ALDORIA, Space surveillance in Paris, February 2025 – September 2026 Permanent contract **(1.8 years)**

R&D Project: Developed control electronics and a KiCad PCB for a 500 mm aluminum telescope for SSA

- Developed the electronics for the telescope control box, including motor drive, mirror heating, and humidity sensing
- Designed the telescope control and alignment PCB in KiCad
- Developed the CAT control software for the Aldoria telescope
- Traveled to Germany to perform Shack-Hartmann measurements for mirror machining
- Traveled to the Canary Islands to install and align the telescope optics at the Hamilton observatory

R&D Project: Developed and qualified a Shack-Hartmann surface-measurement bench for 500/1000 mm mirrors

- Developed optical alignment methods for 1000 mm surface measurements
- Developed Zernike coefficient computation software
- Upgraded the Shack-Hartmann software to support ANSI Zernike conventions
- Studied, qualified, and validated the Shack-Hartmann surface-measurement bench
- Conducted optical tolerancing analysis using Quadoa

Technical Product Manager

ARCYS, Measuring instrument manufacturer in Toulouse, April 2024 – 2024 Fixed-term contract **(6 months)**

Development Project: Developed an underwater obstacle-detection system using stereoscopic cameras for civil nuclear applications

- Built the test bench for underwater collision detection
- Coordinated with technical subcontractors, including the stereoscopic camera supplier and the obstacle-detection software provider
- Authored the technical specification (STD), validation plan, and validation report
- Traveled to the client site to install the equipment and train staff on operating the obstacle detector
- Instrumented the bench to measure the latency and accuracy of the obstacle detector
- Developed detection algorithms for depth maps and RGB images using a ROS2 camera in Python

R&D Engineer

OXXIUS, Laser manufacturer in Lannion January 2022 – 2024 Fixed-term contract **(2 years) (50%)**

R&D Project: Developed a 244 nm frequency-doubled laser for fluorescence spectroscopy in healthcare applications

- Designed an optical architecture for frequency doubling using a BBO crystal and injection lens
- Instrumented the bench to measure power and spectral output
- Simulated diode injection after mirror reflection in Python
- Tested multiple hypotheses to improve the 244 nm laser's performance
- Designed an optical architecture for laser diode mode-locking using Littrow and Littman–Metcalf configurations with a Lyot filter
- Modified the laser diode driver to widen and increase pulse peak voltage
- Authored and presented weekly progress reports using PowerPoint

R&D Project: Studied thermal management of high-power visible laser diodes for healthcare applications

- Wrote the experimental plan to evaluate thermalization solutions for the diode-to-heatsink interface
- Instrumented the test bench to measure temperature and power
- Ran thermalization tests using Nanofoil, thermal grease, and thermal paste
- Authored the study report on diode thermalization using Word
- Processed and analyzed experimental data in Excel and Python

R&D Engineer

Institut FOTON, CNRS in Lannion, January 2022 – 2024 Fixed-term contract **(2 years) (50%)**

R&D Project: Developed a low-noise 532 nm laser based on the Brillouin effect for quantum computing applications

- Built the bench for fiber-port injection and power control via an optical amplitude modulator on the pump laser
- Built the Brillouin laser using a fiber resonator and a 2x2 coupler
- Instrumented the bench to measure beat note, frequency noise, power, and spectrum
- Automated measurements by programming in Python and MATLAB
- Processed and analyzed experimental data using OriginPro and Python
- Authored and presented study reports using PowerPoint and Word

R&D Project: Developed nanosecond-scale blue pulsed laser sources at 450 nm

- Conducted a state-of-the-art review of nanosecond-scale optical pulse generation
- Built a 450 nm pulsed laser using sinusoidal modulation via a bias-tee
- Authored and presented weekly progress reports using PowerPoint

R&D Engineer

Institut PPRIME, CNRS in Poitiers, September 2019 - 2021 Fixed-term contract (**2 years)**

R&D Project: Industrialized the near-infrared bichromatic pyroreflectometer to support technology transfer from public research to a private company for commercialization

- Built the optical head and fiber bundle for emission and reception (Patent: WO2023118462)
- Instrumented the bench to measure reference temperature, luminance temperature, and reflectivity
- Simulated in Python the impact of uncertainties and instabilities in reflectivity and luminance-temperature measurements on the measured temperature
- Programmed the Teensy microcontroller (Arduino IDE) to compute temperature
- Calibrated reflectivity and luminance temperature using LabVIEW
- Machined mechanical parts to add distance measurement to the optical head
- Authored and presented weekly progress reports using PowerPoint

R&D Project: Developed remote distance-measurement sensors using optical fibers

- Built an Arduino-based prototype for feasibility demonstration
- Programmed the Arduino for distance measurement and its interface

Master's (M2) Internship

Institut PPRIME, CNRS in Poitiers March 2019 – 2019 **(6 months)**

R&D Project: Developed the near-infrared bichromatic pyroreflectometer for remote temperature measurement in aerospace applications

- Developed the mathematical model for temperature computation (Patent: FR3131370)
- Conducted a literature review on the state of the art in remote temperature measurement
- Authored the study report on the pyroreflectometer's development and potential improvements using Word
- Authored and presented weekly progress reports using PowerPoint
- Calibrated the pyroreflectometer across a 500 °C to 1500 °C range
- Processed and analyzed experimental data using Excel
- Tested multiple hypotheses to improve the pyroreflectometer's performance

Master's (M1) Internship

DEFTA, Automotive parts in Château-Thierry, May 2017 - 2017 **(3 months)**

Project: Replaced manual dial-gauge dimensional inspection with automated inspection using a CMM

- Conducted a market study of 3D measurement technologies
- Authored and presented an instrument purchase proposal covering both financial and technical aspects
- Ensured MSA compliance (R&R, ANOVA) and IATF 16949 certification
- Performed various compliance tests and trials
- Met with and traveled to CMM suppliers

Bachelor's (L3) Internship

ADISS, Engineering office in Lille, October 2015 - 2016 **(6 months)**

R&D Project: Developed methods to measure voids in prestressed bridges for civil-engineering structural diagnostics

- Set up and supervised various tests and trials
- Processed and analyzed experimental data (Excel, Python)
- Presented and proposed new scientific research projects
- Conducted a market study of non-destructive testing technologies
- Developed new measurement methods
- Traveled on-site to set up measurements

Languages

French : Native language **English :** C1 **Armenian :** Native language

Diplomas and Documents

Diploma: Master 2 Instrumentation and Measurement 2019

Applied Physics Bachelor's degree

Article: Hz-level intrinsic linewidth Brillouin fiber laser in the visible range

Patent: Method And Bichromatic Pyroreflectometer Device for Determining The Temperature Of A Surface (WO2023118462, FR3131370)

Software

QUADOA : Tolerancing **KiCad :** PCB Design **Python :** Simulation

Interests

3D Printing : Creality Ender 3 pro

Arduino : Prototyping

Scientific watch : https://consensus.app/

Artificial Intelligence : Code

Networks and Hobbies

LinkedIn: https://www.linkedin.com/in/casta-edgar-00a85256/

Site: https://www.optroxrd.com

Sport: https://www.fitnesspark.fr