Rafael Ode Brino

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Education

ENSTA — National School of Advanced Techniques — Brest, France
Engineering Degree — Observation Systems & AI (expected 2027) — *2025 – Present*
- Coursework: Artificial Intelligence & Decision Support.

Federal University of Rio Grande do Sul (UFRGS) — Porto Alegre, RS, Brazil
Double degree — BSc in Electrical Engineering (expected 2028) — *2023 – Present*
- Coursework: Signals and Systems.

Projects

Augmented Reality Simulation for Medical Training (ENSTA) | *C#, C++, Python* — 2025 – Present
- Designed a real-time perception pipeline for tracking and image analysis; trained and validated ML components in Python (PyTorch).
- Developed native C++ modules for real-time 6D pose estimation/tracking prototypes and integrated them into Unity as a native plugin via C# interop (bindings), iterating through testing to improve runtime stability and robustness.

Waveforms & Modulations (ENSTA) | *MATLAB, Signal Processing* — Jan. 2026
- Simulated an end-to-end digital transmission chain (OOK & DSSS) over an AWGN channel and measured BER across operating conditions.
- Built reusable modules for modulation/demodulation, spectral analysis (FFT/fftshift), and BER evaluation.

Mass Estimation via Computer Vision (UFRGS) | *Python, PyTorch, OpenCV* — 2024 – 2025
- Built a supervised regression model to estimate object mass from images; created the dataset and applied advanced preprocessing.
- Performed evaluation and error analysis to improve stability and reproducibility.

Forest Mapping with Detection and SLAM (UFRGS) | *Python, OpenCV* — 2024 – 2025
- Implemented a 3D mapping pipeline combining stereo visual odometry, 3D triangulation, and EKF-SLAM.
- Validated tracking stability and trajectory accuracy across multiple scenarios under near-embedded constraints.

Professional Experience

Project Contributor — 2024 – 2025
AgroView (Startup) — *Porto Alegre, RS, Brazil*
- Built a computer vision prototype for early detection of stress and deterioration in lettuce plants (Python, OpenCV).
- Improved prediction reliability through experimental validation in real conditions and iterative pipeline refinement.

Volunteer — 2019 – 2025
High School (CEAT) — *Lajeado, RS, Brazil*
- President (2022): Led the organization of the school's annual Gincana—a student-run competition that builds leadership and organizational skills through theoretical and hands-on challenges—and, as a result, it enables yearly food and hygiene donation drives that exceed half a ton, as well as large-scale blood donation campaigns.

Technical Skills

Programming: Python, MATLAB, C, C++, C#, Java
Computer Vision & ML: YOLO (detection/segmentation/training), OpenCV (image processing, tracking), Vision Transformers, supervised regression
Signal Processing: OOK, DSSS, AWGN, FFT/fftshift spectral analysis, BER evaluation
SLAM & Estimation: stereo visual odometry, 3D triangulation, EKF-SLAM, sensor fusion
Tools: Unity, Git/GitHub, Linux, Bash, LaTeX, Jupyter, VS Code, PyCharm, CLion, Rider

Languages

English: Bilingual - Fluent | French: Advanced | German: Elementary | Portuguese: Native