

# Alejandro Garnung Menéndez

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 <https://agarnung.github.io/>



My interests focus on the research and development of analytical techniques and machine learning for **computer vision** and **image processing** to continuously improve a variety of applications, with an emphasis on cutting-edge systems and processes that involve object inspection and measurement algorithms, particularly in digital images and 3D point clouds.

## Skills

**Programming:**     C++     C     Python     Matlab     OpenGL     GLSL

**Frameworks:**     Qt     Linux     VS Code     Docker     ROS

**Libraries, tools, and others:**

OpenCV, Open3D, PCL, CloudCompare, OpenMesh, VTK, PostgreSQL, Eigen, STL, TensorFlow, Keras, PyTorch, scikit-learn, SQL, MariaDB, MongoDB, HTML, CSS, JavaScript, ensamblador PIC y x86, XML, URDF, SDF, Blender, shell, R Commander, App Inventor, Processing, VHDL, GRAFCET, ST, Ladder, FBD, SFC, IEC 61131-3, Microsoft Office, VBA, Maxima, AutoCAD, Proteus, PSIM, Quartus II, LTSpice, CODESYS, UnityProXL, Automation Builder, Qt Creator.

## Professional experience

04/09/2023 - 13/11/2023 (3 months)

**Research Development Engineering Intern** - CIN Advanced Systems Group.

✓ Advanced simulation – detection and classification algorithms – industrial software deployment – sensor integration.

14/11/2023 - 14/11/2024 (1 year)

**Computer Vision Engineering Intern** - CIN Advanced Systems Group.

✓ Surface defect detection – study of industrial solutions – software for continuous monitoring and real-time analysis with 2D cameras – image processing using analytical techniques and artificial intelligence.

14/11/2023 – present

**Computer Vision Engineer** - CIN Advanced Systems Group.

✓ Implementation of real-time metrology systems – high-precision inspection and measurement algorithms with 3D laser technology – point cloud reconstruction and filtering – deployment of computer vision solutions.

## Education

**Bachelor's Degree in Industrial Electronics and Automation Engineering** (UniOvi) (2018 - 2022). Grade: 7,43.

▪ Mobile robotics – programming in ROS – embedded systems.

▫ Bachelor's Thesis: Integration of an omnidirectional autonomous educational mobile robot in ROS (grade: 10).

**Master's Degree in Automation Engineering and Industrial Informatics** (UniOvi) (2022 - 2024). Grade : 9,34.

▪ Computer vision – applied mathematics – image processing – algorithms – integrated industrial systems – detection – classification – simulation – advanced experimentation – artificial intelligence.

▫ Master's Thesis: <https://hdl.handle.net/10651/76231> (grade: 10).

**PhD in Energy and Process Control** (UniOvi) (2024 - present).

▪ Specialization in 3D computer vision.

## Complementary training

- III Electrical Sector Seminar EDP (05/05/2021 - 13/05/2021) (EDP - EPI Gijón).
- MATLAB Onramp (07/02/2022) (MathWorks).
- Image Processing Onramp (22/09/2022) (MathWorks).
- Automation Technology in Theory and Practice According to IEC 61131 (Feb. 2023) (Phoenix Contact and UniOvi).
- Workshops "Applications on Industry 4.0 - Education & Training for Automation 4.0 in Thailand/ETAT" (22/03/23) (EPI Gijón).
- Camera and Imaging - First Principles of Computer Vision Specialized Course (11/07/23) (Columbia University).
- Visual Perception - First Principles of Computer Vision (13/08/23) (Columbia University).
- Features and Boundaries - First Principles of Computer Vision (24/11/23) (Columbia University).
- 3D Reconstruction - Multiple Viewpoints (09/01/24) (Columbia University).
- 3D Reconstruction - Single Viewpoint (10/01/24) (Columbia University).

## Publications

Physics Meets Pixels: PDE Models in Image Processing (Preprint, arXiv) (dec. 2024).

A Hybrid Framework for Statistical Feature Selection and Image-Based Noise-Defect Detection (Preprint, arXiv) (dec. 2024).

## Languages

Spanish: Native speaker.

English: ILR Level 3 in English - Professional working proficiency. Advanced skills in oral and written comprehension and communication. University-level academic experience (GIELIA01-4-017, University of Oviedo).