

Alejandro Garnung Menéndez

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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](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).