

Enrique Hernández Noguera

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Summary

Computer Science undergraduate and deep-learning researcher, first author on two arXiv papers spanning neural operators for scientific computing and computer vision for structural inspection. Comfortable end to end, from architecture design and training to deployment on robots (ROS) and the web.

Education

Universidad de Murcia

Murcia, Spain

B.S. Computer Science (GPA 3.6); ISEP exchange year at the University of New Orleans, 2025–2026 Expected May 2027

- Relevant coursework: Machine Learning, NLP, Intelligent Agents, Algorithms & Data Structures, Compilers, Concurrent & Distributed Programming, Operating Systems, Computer Networks, Databases.

Publications

- **E. Hernández Noguera**, M. M. Ferdaus, E. Ioup, M. Abdelguerfi, J. Simeonov. “Bridging Spectral Operator Learning and U-Net Hierarchies: SpectraNet for Stable Autoregressive PDE Surrogates.” *arXiv:2605.09096*, 2026. [[arXiv](#)] [[code](#)]
- **E. Hernández Noguera**, M. M. Ferdaus, E. Ioup, M. Abdelguerfi. “DeltaSeg: Tiered Attention and Deep Delta Learning for Multi-Class Structural Defect Segmentation.” *arXiv:2604.18745*, 2026. [[arXiv](#)]

Research Experience

Canizaro Livingston Gulf States Center for Environmental Informatics (UNO)

New Orleans, LA

Undergraduate Research Assistant — Computer Vision & Robotics

Oct 2025 – Present

- Designed attention-based encoder–decoder segmentation architectures (depthwise-separable backbones, ASPP, channel and spatial attention, learned skip-connection refinement) for multi-class defect detection on concrete and culvert/sewer infrastructure; published as DeltaSeg.
- Deployed PyTorch segmentation models on a **Clearpath Jackal ground robot via ROS** for autonomous traversal and real-time defect inspection inside culverts and sewer pipes.
- Built reproducible training and evaluation pipelines, including ablation harnesses and test-time augmentation.

Universidad de Murcia — DITEC Research Group

Murcia, Spain

Undergraduate Research Assistant — High-Performance Computing

Sep 2024 – Aug 2025

- Benchmarked complex graph-processing workloads on modern multi-core systems and analyzed hardware performance counters to characterize memory-bound versus compute-bound regimes.

Selected Projects

BrainJam: AI lecture-to-study-materials web app

Mar 2026

Django REST, React, Whisper, Gemini 2.5

- Full-stack multimodal pipeline turning audio, whiteboard photos and context PDFs into flashcards, notes and exams, with JWT auth, robust recovery from malformed LLM JSON, and SQLite persistence. First place, BrainJam Hackathon.

Defend the Lab: real-time OCR web game

Dec 2025

PyTorch (custom MobileNetV2), Phaser 3, WebSocket

- Custom handwriting-OCR model served live over WebSocket to a browser game with mobile handwriting input.

Earlier coursework projects: Mini-C to MIPS compiler (C), web search engine (C++), multi-host file-hosting server (Java), regex data-filtering system (Python).

Technical Skills

- **Deep learning & CV:** PyTorch, TorchVision, OpenCV; U-Net variants, EfficientViT, FPN, FNO; YOLO, Faster R-CNN, ResNet, MobileNet; depthwise-separable convs, ASPP, SE / CBAM / Coordinate Attention, focal / Dice losses, deep supervision, test-time augmentation.
- **Deployment & robotics:** ROS, Clearpath Jackal, Docker, REST APIs (Django REST Framework), WebSocket model serving, parameter-efficient and edge-aware architecture design.
- **Training infrastructure:** SLURM, multi-GPU clusters, reproducible multi-seed pipelines.
- **Programming & tooling:** Python, Java, C, C++, JavaScript/TypeScript, R, SQL, Verilog; Git, Linux, L^AT_EX, React/Vite, Tailwind, SQLite.
- **Languages:** Spanish (native), English (advanced, TOEFL iBT C1).

Honors & Awards

Tolmas Research Scholarship

Jan 2026

First Place, BrainJam Hackathon

Mar 2026