

Javier Montalvo

PHD IN COMPUTER VISION · MACHINE LEARNING ENGINEER

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EXPERIENCE

Research Engineer

IDENTY.IO

2024 - Current

- Developed Presentation Attack Detection (PAD) models, achieving a **20x reduction** in FAR. Key contributor to obtaining the **iBeta L2** certification, facilitating over **\$5 million** in commercial contracts.
- Engineered a family of mobile-ready backbones, distilled from Foundation Models, to serve as the base models for downstream tasks, enabling a **3x inference speedup** and up to **50% footprint reduction** across multiple product lines.
- Executed end-to-end development of a **Deepfake Detection** module as the **sole owner**. Responsible for the entire stack: sourcing data, designing model architectures, and implementing **production code**.
- Consolidated legacy codebases into a **unified training framework**, significantly reducing **technical debt** and accelerating the team's experimentation cycle.

Doctoral Researcher

UNIVERSIDAD AUTÓNOMA DE MADRID / VPULAB

2021 - 2024

- Developed a custom dataset generation tool using **Unity Engine** for spacecraft navigation imagery, reducing pose estimation model error by up to **65%** compared to traditional datasets.
- Implemented novel data generation techniques in **CARLA**, enabling **contrastive learning** in unsupervised domain adaptation pipelines for semantic segmentation.
- Leveraged **Stable Diffusion** to complete missing classes in semantic segmentation datasets, enhancing model performance in unsupervised domain adaptation pipelines by up to **20%**.

SKILLS

Programming: Python, C++, C#, JavaScript

AI & Vision: PyTorch, TensorFlow, ONNX, OpenCV, Hugging Face, Transformers, Unity, CARLA

DevOps/Web: Git, Docker, AWS, Node.js, Next.js, MongoDB

PROJECTS

Vooyai | *Node.js, Flask, Docker, AWS, MongoDB*

2022 - 2023

- Engineered the backend REST API serving **1,500+ users**, containerized via Docker and deployed on AWS EC2.
- Integrated OpenAI, Mapbox, and Stripe, and implemented WebSockets for real-time sync, reducing response times by **60%**.

Quackmate | *Next.js, Supabase, Cloudflare R2, DALL-E 3*

2023 - 2024

- Developed a full-stack social media manager using Next.js and Supabase to automate scheduling and analytics.
- Built a generative AI asset pipeline integrating DALL-E 3 and Cloudflare R2 for low-latency object storage.

EDUCATION

PhD in Computer Vision

UNIVERSIDAD AUTÓNOMA DE MADRID

2021 - 2024

MSc in Deep Learning for Audio and Video Signal Processing

UNIVERSIDAD AUTÓNOMA DE MADRID

2020 - 2021

BSc in Computer Science & BSc in Mathematics

UNIVERSIDAD AUTÓNOMA DE MADRID

2013 - 2020

SELECTED PUBLICATIONS

- “J. Montalvo et al.** “Leveraging Contrastive Learning for Semantic Segmentation with Consistent Labels Across Varying Appearances”, *arXiv preprint*, 2024.
- “J. Montalvo et al.** “SynthmanticLiDAR: A Synthetic Dataset for Semantic Segmentation on LiDAR Imaging”, *IEEE International Conference on Image Processing (ICIP)*, 2024.
- “J. Montalvo et al.** “SPIN: Spacecraft Imagery for Navigation”, *arXiv preprint*, 2024.
- “J. Montalvo et al.** “Exploiting semantic segmentation to boost reinforcement learning in video game environments”, *Multimedia Tools and Applications*, 2023.