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Francisco Ramos

Machine Learning Engineer
UC Berkeley

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Education

Master of Engineering in Control of Robotics and Autonomous Systems - Computer Sciences, *UC Berkeley* 2023 — 2024
- Natural Language Processing, Deep Learning for Visual Data, Machine Learning for Modeling Processes, Control of UAVs
- Research: Sky Computing Lab: Finetuning LLMs using generalization metrics and correlational analysis.

Master of Science in Mechatronics, Robotics and Automation Engineering, *Universidad Politécnica de Madrid, UPM* 2022 — 2023
- Project manager: Autonomous UAV System: Drone for Autonomous Drone Racing Competition (12 team members)

Bachelor of Science in Mechatronics, Robotics and Automation Engineering *Universidad de Sevilla, ETSI* 2018 — 2022
- **Top 1%** in +300 students, 13 honors awards (with distinction) in different courses
- Awarded Best Final Project among +600 candidates. Final Project: "Charge demand and renewable generation forecasting with Deep Learning: application to electric vehicle station optimization." - Awarded with Honours
- Personal Project: Pan & Tilt servo system autonomously controlled using Facial, Hand and Color Detection

Additional Courses :
- TensorFlow Developer Specialization - Professional Certificate (4 courses), *DeepLearning.AI* 2022
- Internet of Things and Embedded Systems, *University of California, Irvine* 2020
- Deep Learning Specialization by Andrew NG (5 courses), *DeepLearning.AI* 2019

Technical Experience

Software Engineer - Robotics **08/2023 — PRESENT**
AI Racing Tech - Robot Open Autonomous Racing (ROAR) UC Berkeley *Berkeley, California*
- Researched **Autonomous Racing**, focusing on software, hardware, and simulation tools promoting ai-racing competitions.
- Implemented **End-to-End Self Driving car** with Behavior Cloning using Neural Networks and Reinforcement Learning.
- Established **Simulation Environments** within the Carla platform, featuring sensor integration and control implementations.
- Fastened ROS2 communication -80% by optimizing message transmission with TCP, UDP and message serialization techniques.

Machine Learning Engineer **02/2022 — 08/2022**
Advanced Center for Aerospace Technologies - CATEC *Seville, Spain*
- Utilized High Altitude Platform Station (HAPS) and **Computer Vision** techniques to apply photogrammetry for crop monitoring, enhancing crop management efficiency and analysis accuracy, providing +5 different tools and use cases.
- Incorporated **Object Detection** algorithms into unmanned aerial vehicles (UAVs) to enhance aerial safety by enabling effective detect and avoid algorithms achieving +70% accuracy.
- Evaluated +10 state-of-the-art object detection models with **Transformers**, selecting the most efficient one resulting in a 15% decrease in inference time on embedded systems.
- Utilized unsupervised learning models for the implementation and training of an **Anomaly Detection** system in road inspections.
- Publication: Benchmark on real-time long-range aircraft detection for safe RPAS operations. DOI: 10.1007/978-3-031-21062-4_28

Machine Learning Engineer **09/2021 — 07/2022**
Systems Engineering and Automation Department, University of Seville *Seville, Spain*
- Developed an integrated system simulator for an Electric Vehicle (EV) charging station supplemented with renewable energies.
- Enhanced operational efficiency through the utilization of **Time-Series** deep learning models to forecast both the charging load and energy production, thus facilitating management optimization.
- Publications: Optimized Operation of an Electric Vehicle Charging Station with Photovoltaic Support and Vehicle-to-Grid Implementation. DOI:10.1007/978-3-031-10047-5_62 - DOI:10.17979

Electronics Engineer **09/2019 — 08/2021**
US Racing - Electric Powertrain & Electronic systems department *Seville, Spain*
- Analysis and description of the high and low voltage electrical systems pertaining to the electric motorbike.
- Design of key components such as the Battery Management System (BMS), inverter, motor, charger, and telemetry.

Skills

Research	Deep Learning, Natural Language Processing (NLP), Computer Vision, Time Series Analysis, Reinforcement Learning, Generative Adversarial Networks (GANs), Neural Architecture Search (NAS), Object Detection, Sentiment Analysis, Image Segmentation, Speech Recognition, Large Language Models (LLMs) fine-tuning, Machine Translation, Text Generation, Transformers, Difussion Models
Languages	Python (TensorFlow, PyTorch, Keras, Scikit-learn, OpenCV, Pandas, NumPy), C, C++, MATLAB, R, SQL, Java, JavaScript,
Tools	PySpark, Hugging Face Transformers, FastAI, ROS2, Git, Docker, Bash/Shell scripting, Jupyter Notebooks, AWS, Azure, Google Cloud Platform (GCP), Kubernetes, Django, HTML/CSS
ML/AI	Supervised Learning, Unsupervised Learning, Semi-supervised Learning, Active Learning, Ensemble Methods, Neural Networks, Convolutional Neural Networks (CNN), Recurrent Neural Networks (RNN), Long Short-Term Memory (LSTM), Transformer Models, Attention Mechanism, Bayesian Methods, Convex Optimization