Eduardo José Duarte Peña

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AI Systems Engineer · Machine Learning Engineer · Full-Stack & IoT Developer

Professional Summary

AI Systems Engineer with a Mechatronics background who designs and ships **end-to-end ML and AI systems** —from sensor and signal data acquisition and feature engineering to model training, optimization, and production deployment on **Microsoft Azure, AWS**, and edge devices, including real-time inference pipelines and applied AI for signal processing and geospatial intelligence. As a freelancer, ships complete products for clients—**IoT-connected machines, web platforms with payments, and mobile apps**—with Python, FastAPI, React, and Flutter.

Education

Universidad Santo Tomás — **Bucaramanga, Colombia**
B.Sc. in Mechatronics Engineering — *2019–2025*

Google – Coursera
Data Analytics Professional Certificate — *2023*

Professional Experience

Space-Eyes — **Medellín, Colombia**
AI Systems Engineer — *Jun 2026 – Present*
AI-driven Counter-UAS and geospatial intelligence for defense, security, and enterprise customers.

Machine Learning Engineer — *Oct 2025 – Jun 2026*

- Trained and optimized **deep-learning models** on **Microsoft Azure** (Azure ML, AKS) and **AWS** (EC2, S3), enabling reproducible training workflows and scalable inference across cloud providers.
- Architected an **end-to-end ML pipeline** —data acquisition, feature engineering, model training, and edge deployment— for real-time signal classification on resource-constrained devices.
- Engineered an **ML-driven distributed detection & localization system** on edge hardware, integrating model inference with custom data-acquisition stacks.
- Defined the **mathematical foundations for ML-based geolocation algorithms**, producing internal reference documentation adopted as team standard.
- Deployed a **resilient distributed architecture** sustaining stable telemetry and data transmission over distances up to **5 km** for real-time model inputs.
- Built a **scalable FastAPI backend** exposing model predictions and data through REST APIs, and a **React frontend** for real-time visualization, system health, and geospatial inference output.
- Led the **transition from MVP to Tier-1 production architecture**, defining system tiers, eliminating bottlenecks, and improving scalability, modularity, and reliability of the ML platform.

Freelance — **Remote**
Full-Stack & IoT Developer — *Apr 2026 – Present*

- Built **Portal Madre Tierra** (madretierragroup.co), a production platform for water vending machines: **ESP32** units report sales and telemetry to a **FastAPI** backend on **Vercel** with **Supabase**, and a **React** dashboard shows live sales, a machine map, alerts, and remote control.
- Integrated **Wompi** recurring payments for subscriptions and a public catalog with a quote builder, prerendered for **SEO**.
- Shipped **Nest – Finanzas en Pareja** to **Google Play**: a **Flutter** app for couples' shared finances on **Supabase** (RLS, **Edge Functions**), with push notifications and **RevenueCat** subscriptions.

ELVA AI — **Remote**
Machine Learning Engineer — *Aug 2025 – Sept 2025*

- Trained a **multi-class deep-learning classifier** (Wi-Fi, LTE, DVB-T) from raw input samples, optimized for resource-constrained edge devices.
- Automated **city-level model performance reports** including confusion matrices and interactive visualizations, eliminating hours of manual reporting.
- Hardened cloud deployment by implementing **Azure AD authentication on AKS**, with complementary ML workloads on **AWS** (S3 storage, IAM-based access control).
- Reduced cloud storage costs by **20%** through disk-tier optimization and lifecycle/retention policies across Azure and AWS.

Tayronama SAS — **Santa Marta, Colombia**
Industrial Automation Developer (Freelance) — *Mar 2025 – Jul 2025*

- Developed a **Python data-acquisition application** for livestock traceability with real-time integration via serial communication.
- Engineered ETL workflows in Pandas and built **Power BI dashboards** surfacing operational KPIs to stakeholders.
- Automated client report delivery through the **WhatsApp Business API**, eliminating manual dispatch and improving communication SLAs.

Merck Sharp & Dohme (MSD) **Bogotá, Colombia**

Innovation & Technology Intern – Data Analytics *Jul 2024 – Feb 2025*

- Saved over **30 hours per month** by re-engineering training processes through data-driven analysis.
- Built a **KPI monitoring system in Power BI** ensuring continuous performance visibility for leadership.
- Delivered automation solutions with **Power Apps and Power Automate**, increasing operational efficiency across multiple workflows.
- Processed large pharmaceutical datasets using **Python, SQL, and ML libraries** to support evidence-based decisions.

Universidad Santo Tomás **Bucaramanga, Colombia**

Data Scientist / Young Researcher *Jun 2023 – Nov 2023*

- Built **ML models** predicting public-transportation routing patterns in Bucaramanga.
- Delivered an interactive **Power BI dashboard** surfacing urban mobility insights for civic stakeholders.
- **Co-author**, *Advances in solutions on public transportation problems with AI* (peer-reviewed publication).

Technical Skills

Machine Learning & AI: PyTorch, scikit-learn, Deep Learning, Model Training & Optimization, Feature Engineering, Signal Classification, RAG / LLM applications, MLOps

Programming: Python, SQL, TypeScript / JavaScript, Dart, C/C++ (embedded)

Web & Mobile: React, Vite, FastAPI, Flutter, Supabase (PostgreSQL, Auth, Edge Functions), REST APIs, payment integrations (Wompi, RevenueCat)

Cloud & DevOps: **Microsoft Azure** (Azure ML, AKS, Azure AD), **AWS** (EC2, S3, IAM), Vercel, Docker, CI/CD with GitHub, Edge Computing

Signal Processing, IoT & Distributed Systems: IQ processing, SDR (bladeRF), DSP, ESP32, Raspberry Pi, MQTT, real-time telemetry, edge-to-cloud pipelines

Data, Tools & Methods: Pandas, NumPy, Power BI, Power Apps, Power Automate, Git / GitHub, Jira, Claude Code, CRISP-DM, Agile

Awards

2023: **1st Place** – CienTIoN, Research & Innovation · **3rd Place** – Huawei ICT Competition, Cloud Track

Certifications

2026: Claude Code in Action – Anthropic

2025: Deep Learning in Python – DataCamp

2025: Project Management with Jira – LinkedIn Learning

2025: Docker Essentials & DevOps Essentials – LinkedIn Learning

2024: Process Improvement – Harvard Business School Online

2023: Data Science & AI – Universidad de Antioquia (MinTIC)

2023: Machine Learning Fundamentals with Python – DataCamp

2023: Implementing AI Solutions in Business – DataCamp

Languages

Spanish: Native · **English**: B2 – Professional Working Proficiency

References

Sebastián Murcia – General Manager, Tayronama SAS – +57 321 6680277

Iván Lis – Safety Data Manager, MSD – +57 310 7735259

Carlos Pimentel – Research Professor, Universidad Santo Tomás – +57 316 2373049