



Roger Duran Lopez

Industrial Engineering MSc Student | Industrial AI, Smart Manufacturing & Process Optimization

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Profile

Industrial Engineering MSc student focused on applying AI, data and automation to improve industrial processes. Builds practical decision-support and workflow automation tools from production data, shop-floor context and engineering constraints, with experience in manufacturing digitalization, automation design and applied ML projects.

Education

Master's Degree in Industrial Engineering Universitat Politècnica de Catalunya - ETSEIB <i>Honors:</i> High Distinctions - Industrial Data Science and AI, Predictive Maintenance, Industrial Automation and Supply Chain	2025 - Present Barcelona, Spain
Bachelor's Degree in Industrial Technologies Engineering Universitat de Girona <i>Honors:</i> High Distinctions - Artificial Intelligence and Industrial Robotics	2021 - 2025 Girona, Spain

Professional Experience

Industrial Quality Control MMA Louis Vuitton	Oct. 2024 - Mar. 2025 Campllong, Girona
- Built and presented a Power BI application covering approximately 150 machines to monitor critical-process audits, machine OK/KO status, corrective actions and six-month audit history; the tool remained in use after the internship. - Automated periodic KPI reports with Power BI and Power Automate, replacing manual Excel review and making daily meeting actions clearer for quality, production, finance, continuous improvement and department leadership. - Improved audit planning and corrective-action prioritization by reducing duplicate audits and highlighting machines and lines requiring attention; audit participation increased by at least 50%. - Implemented QR-based SharePoint documentation in the AMONT/PREPA production area, replacing paper folders and enabling faster updates to production documentation. - Developed a SharePoint-integrated Excel/VBA barcode workflow to scan production materials, compare references against active master data and register active/obsolete status, enabling obsolete items to be identified and removed from the line.	
Delineante Técnico Eléctrico Autisel Automatismes	Jul. 2022 - Sept. 2024 Maçanet de la Selva, Girona
- Designed EPLAN electrical schematics and PLC I/O lists for industrial automation systems, contributing to customer projects for Henkel, Frit Ravich and Concentrol from engineering design to panel assembly. - Improved repetitive EPLAN workflows and reusable engineering templates, including Excel-assisted preparation of PLC I/O lists with up to hundreds of signals. - Prepared electrical and material data to support panel manufacturing, equipment integration and project execution. - Gained shop-floor exposure through panel assembly, cable routing, maintenance support and troubleshooting of industrial electrical systems.	

AI, Data & Engineering Projects

Fatigue Prediction and Personalized Recommendations Using Fitbit Data, ML and LLMs <i>Python, FastAPI, SQLite, Docker, React, LightGBM, LLM fine-tuning, OpenAI API</i>	Bachelor Thesis
Built a full-stack applied AI assistant that translated wearable physiological data into fatigue-risk indicators and personalized recovery recommendations. Combined a LightGBM predictive module trained on LifeSnaps data from 71 participants with a fine-tuned GPT-4.1 recommendation layer; the ML module reached 77.3% recall, and the fine-tuned layer scored 9.6/10 versus 5.3/10 for the baseline with zero critical safety errors.	
Predictive Maintenance: Virtual Sensors and Actuators <i>MATLAB, Simulink, State-Space Modeling, Fault-Tolerant Control, Optimal Sensor Placement</i>	MSc Project
Designed fault-tolerant control solutions for a two-tank hydraulic system under complete sensor and pump failures. Used rank-condition analysis, pole placement and Simulink validation to recover nominal closed-loop behavior, then solved an optimal sensor configuration problem with weak redundancy degree 2 and minimum cost.	
Industrial Data Science: Accident Typology After Toll Removal <i>Python, Random Forest, Imbalanced Classification, Feature Engineering, Permutation Importance</i>	MSc Project

- Built a leakage-safe descriptive and predictive analysis of 23,146 severe and fatal traffic accidents in Catalonia before and after toll removal. Engineered corridor features, handled an imbalanced target and selected a balanced Random Forest with held-out metrics of 0.6287 macro F1 and 0.7206 ROC AUC.

Industrial Automation: SCADA and IoT Monitoring Web App

MSc Project

PHP, HTML, CSS, MariaDB, SQL, Industrial Monitoring, Data Validation

- Developed a web application over an IoT monitoring database, extending the assignment into a dashboard-based monitoring tool for substations, transformers, sensor associations and readings. Added required-field, numeric-range, duplicate and relationship checks without modifying the database schema.

Artificial Intelligence: Blood Glucose Prediction

BSc Project

Python, Random Forest Regression, Multivariate Time-Series Data, Feature Engineering, Model Evaluation

- Developed a Random Forest model for the GLUP24 challenge to predict blood glucose 30 and 60 minutes ahead using CGM, insulin, physiological and contextual data from six patients; achieved 23 mg/dL mean RMSE at the 30-minute horizon.

Process Digitalization and Commercial Operations System

Personal Project

Python, Flask, AI-Assisted Workflows, Process Design, Workflow Automation, KPI Dashboards, Data Validation

- Designed and built a system that turns prospective engineering firms into prioritized, traceable opportunities. Its AI-assisted workflow covers company research, weighted evaluation, reports and tailored first-contact email drafts with human review; a Python CLI and terminal and Flask web dashboards share canonical data, funnel KPIs, event logging, status synchronization, validation rules and 54 automated tests.

Technical Skills

Industrial AI and Data

Python, R, Machine Learning, Feature Engineering, Model Evaluation, Imbalanced Classification, Model Interpretability, LLMs

Smart Manufacturing and Automation

Industrial Process Analysis, Industrial Robotics, Predictive Maintenance, Fault-Tolerant Control, EPLAN, PLC I/O Lists, Electrical Schematics

Operations and Digitalization

Power BI, Power Automate, DAX, Excel/VBA, SharePoint, KPI Reporting, QR Workflows, Process Documentation

Engineering Tools

MATLAB/Simulink, FastAPI, Docker, SQLite, MariaDB, Git/GitHub, SolidWorks, Codex, VS Code

Languages

Catalan - Native

Spanish - Native

English - B2 Cambridge Certificate