

# Gianmarco Santoro

## Data Scientist - AI | Mechanical Engineer - Automation

Engineer, currently focusing on **AI**. Some of my projects:

- **Computer Vision** | **DeepFake** images **Detection**: **60% mean AUC-ROC** on 5 forgeries
- **IT** | **Automatic PLC mapping process** & alarms selection in Python: **time consumption cut**
- **Automation** | Automatic **factory indoor temperature control** system: **health & efficiency**
- **Operations research** | Electric vehicles **wireless charging systems auto-optimised** on customer need
- **Startup** | Cultivating ideas: **Project-Driven** Work Community & **Food** Social-Media

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## SKILLS

### IT & Tools

- Python, R, Gitlab, Jupyter, G-Colab, NumPy, Pandas, Matplotlib, Seaborn, Scikit-learn, PyTorch, HTML, CSS
- PLC Siemens (Climatix IC), MsOffice, G suite
- Matlab & Simulink, AutoCAD, SolidWorks

### Basic level

- Manage-Prototyping: Trello, Notion, Canva, Mural, Figma
- C, Bash, SSH, TCP-IP, Modbus, qModMaster, mRemoteNG, CATIA, HyperMesh/Etrude, MSC-Adams/Apex

### Languages

- **Italian** | Mothertongue
- **English** | C1 - Professional
- **German** | A2 - Basic

### Further vertical skills summary

- **Energy**: power plants, fluid machines, technical physics (HVAC, heat exchange, acoustic, lightning)
- **Small civil projects**: buildings, bridges, retaining walls, hydraulic systems, topography and appraisal

## PROFILE

From **EU**, free to relocate

### Areas of interest

Energy transition & management, smart devices, robotics, automation, R&D, AI, computer vision, aerospace, e-mobility, materials re-cycle, health, new idea dev.

### More about me

My interests range from science, tech, food, art, nature, to travel, games, music, wellness  
My sports: mainly running, swimming, gym  
I love to continuously improve products, details & my abilities, focusing on the big picture to keep efficiency high

## EXPERIENCE

### DeepFake Detection | Computer Vision project

MICC (UniFi) | Florence, Italy | Dec 2023 - Apr 2024

**DeepFake Detection Exploiting Self-Attention Maps**: performed Out-of-Distribution Detection on *FF++* dataset achieving a mean AUC-ROC of 60% on five types of forgeries.

### Smart Center | IT & System Integration

Daikin Applied Europe SpA | Rome, Italy | Jun 2021 - Sep 2022

Dealt with **cloud for HVAC plants** monitoring, integrated systems and services:

- **Automating processes** in Python to simplify PLC-SWs development.
- Cloud **web API** use to create services as periodic reports.
- Siemens PLC **control system** to regulate factory temperature, from sensors to cloud.
- Troubleshooting of customers difficulties with cloud and **M2M** connection.
- **Ideas** to innovate products: iFrame to embed external services into cloud dashboard.

### Wireless Charging System | Operations Research project

Enernove Srl | Turin, Italy | Apr 2020 - Mar 2021

Methodology design to predictively project the infrastructure components of an innovative **wireless dynamic charging system** for electric vehicles, in industrial logistics:

- **Mathematical model** develop and optimization via genetic algorithm for projecting an **integrated logistic system** according to energy-economic customer needs.

### Chip Extrusion Recycling | Experimental research project

Institut für Umformtechnik und Leichtbau | Dortmund, Germany | Feb - Sep 2018

**Aluminum recycling process** experimentation by direct extrusion of the waste material, a technique called **Chip Extrusion**, applied to different kind of chips mixture (**DoE**):

- **Analysis** of mechanical (traction, hardness), metallurgical (microstructure, metallography), chemical and aesthetic characteristics of extruded profiles.
- Process simulation via **FEM** software. Simulation vs experiment data analysis.
- **Feasibility assessment** of the process over industrial use, bottlenecks identification.

## EDUCATION

### Data Science & Statistical Learning | II Level Master

UniFi & IMT for Advanced Studies | Feb 2023 - Apr 2024 | 110/110 cum laude

Some topics: Optimisation, GIS, ML, **DL**, **NLP**, Graph Theory. A few **projects**:

- **ML pipeline**: California housing Dataset | Grid Search on linear regression degree.
- **Economics**: US salary prediction on features like education via CART models.
- **DL**: CIFAR-10 images recognition via CNNs models trained on CUDA with PyTorch.
- **Network** analysis on social relations (centrality, community detection).
- **Policy impact**: causal inference on relationship via diff-in-diff.

### Mechanical Engineering

M.Sc. @ PoliTo & B.Sc. @ UniBo | Until Apr 2021 | 104/110

Specialized in **automation**. Some extra projects:

- Full **design** of a two-stage reduction gearbox for general applications.
- **Thermal design** of hot air boiler and home heating system.
- **Numerical model**: air-hot fumes metal flue heat exchange.
- **FMECA** of UniBo "Emilia" solar car component.
- Automation and mechatronics labs (PLC, PID controls, pneumatic circuits)