Tomas Monopoli

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Career Summary

PhD-level electrical engineer specializing in **physical modeling and optimization**. Strong foundation in AI and statistics; experienced in applying machine learning, deep learning, and computational electromagnetics to improve satellite testing and development. Strong background in **adaptive sampling, neural networks, and reinforcement learning** applied to complex physical models. <u>Industry experience</u> with **European Space Agency** and **CERN**.

Education

PhD | Politecnico di Milano, European Space Agency (ESA) [<u>List of Publications</u>] :	2020 – 2025

Utilizing AI and ML-based methods for optimization and modelling of satellite electromagnetic environment. The results aid data-driven testing of electronics boards for space missions.

<u>**Alta Scuola Politecnica**</u> **| Politecnico di Milano, Politecnico di Torino**:	2018 - 2020

merit-based honor program; 150 best students from the two largest Polytechnic schools in Italy.

Msc. Electrical Engineering | Politecnico di Milano, Politecnico di Torino:	2017 - 2020

Double Degree, 110 cum Laude (*with honors*)

Bsc. Electrical Engineering | Politecnico di Milano, 110/110	2014 - 2017

Experience

Visiting Researcher | Technical University of Hamburg (TUHH), Hamburg, DE	2023 - 2024

Worked with Theoretical Electromagnetics (TET) group; optimizing electromagnetic models, adaptive sampling.

Visiting Research Fellow | European Space Agency (ESA) / ESTEC, Noordwijk, NL	2021

Working onsite to improve testing methods for small satellites (CubeSats).

R&D Intern | Edison, Milan, IT	2019

Managed projects on Technological Innovation and Development, collaborating with Divisions and Business Units.

Entrepreneur in Residence (Summer Intern) **| CERN** , Geneva, CH	2019

<u>CESP program</u>, 14 master students from all over the world for 5 weeks of high-tech venture creation

Co-Founder SmartBin | <u>**Startup & Entrepreneurship School Program**</u>,| Turin, IT	2018 - 2019

Smart-bin that automatically sorts into recycling classes. Developed **convolutional neural network** from VGG16 net for image recognition. Raspberry Pi, camera and step motors were programmed for sorting the waste. Presented the prototype at a technology and innovation fair held in Turin (<u>Italian Tech Week</u>).

Technical Skills

Coding | Python, MATLAB | pytorch, tensorflow | docker | git | vscode | linux

Languages

Italian, English: mother tongue

Projects

Advanced Optical Character Recognition System for Academic Papers	[**portfolio**] [**github**]

Based on the swing transformer <u>NOUGAT model</u>; integrated with LLMs for **Retrieval Augmented Generation** (RAG). Integration with **Notion API**.
Input: Academic paper/article in PDF format; **Output**: Markdown files or Notion pages.

Other Activities

- **Technical Reviewer** for scientific journals (TEMC, LECPA, IEEE Access) and AEES 2023 conference
- **Presenter** at conferences (COMPO 2024, GEMCCON 2020) and **Session Chair** for PTSET 2023