Antonio Squicciarini

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PROFILE

Mechanical Engineer and Machine Learning Specialist with expertise in fault detection, deep learning optimization, and signal processing. Strong background in information theory and applied AI research across academic and industrial projects.

EDUCATION

PhD Student in Applied Mathematics and Statistics 2021–Present
Universidad Politécnica de Madrid (UPM) & Universidad Complutense de Madrid (UCM)
IMEIO Doctoral Program — Madrid, Spain
Expected Graduation: September 2025
Thesis: *Design of Deep Learning Classification Algorithms Based on Information and Complexity Metrics*
Developing novel regularization and feature extraction strategies for deep learning using information-theoretic functionals, such as Jensen divergences. Applications include class imbalance, label noise, and anomaly detection in time series.

Research Mobility Aug–Dec 2024
Cornell Tech, Cornell University - Sabuncu Lab — New York, NY, USA
Research on robust learning under label noise.

MSc in Mechanical Engineering 2018–2020
Politecnico di Torino — Turin, Italy
Final grade: 110L/110
ERASMUS+ exchange at Escuela Técnica Superior de Ingenieros Industriales, Universidad Politécnica de Madrid (2019–2020) — Madrid, Spain

BSc in Mechanical Engineering 2015–2018
Politecnico di Torino — Turin, Italy
Final grade: 110/110

WORK EXPERIENCE

Researcher in Machine Learning and Data Analysis 2020–2021
Universidad Politécnica de Madrid (UPM) — Madrid, Spain
Designed and implemented machine learning algorithms for high-voltage partial discharge diagnosis.

SKILLS

- **Programming**: Python (TensorFlow, PyTorch), R, MATLAB, C
- **Tools**: Git, LaTeX, Jupyter, SolidWorks, ANSYS, NX Siemens, FlexSim, Automation Studio, Azure AI Studio
- **Soft Skills**: Critical thinking, scientific writing, problem-solving, teamwork, time management, public speaking, adaptability
- **Languages**: Italian (native), English and Spanish (fluent)
- **Other**: EU Driving License (B)

CERTIFICATIONS

- Microsoft Azure AI Fundamentals (2022)
- Quantitative Research Methods (IEN-UPM/CSIC, 2022)
- Qualified Engineer, Italy — Section A, Sector B (2020)

PROJECTS

Jensen-Tsallis Divergence for Supervised Classification
Developed a novel Jensen-Tsallis loss to improve neural network performance under data imbalance. Evaluated on CNNs across open image datasets.
Accepted in Machine Learning (Springer), ECML PKDD 2025 Special Issue. Forthcoming publication.
GitHub Repository

Early Stopping Without Validation Data
Proposed an early stopping method for noisy labels that avoids using a validation set, enabling full data usage during training. *Paper in preparation.*

Time Series Anomaly Detection with Novel Featuresh
Designed a new feature extraction strategy for detecting anomalies in multichannel time series (CHB-MIT EEG data), benchmarking deep learning models including Transformers and TCNs.
Published in Mathematics (MDPI), DOI: 10.3390/math12152396.
GitHub Repository

Rub Detection in Aeroderivative Gas Turbines
Built a deep learning system for rub fault detection using synthetic vibration signals. Compared DNNs against traditional ML methods (SVM, KNN, AdaBoost).
Published in Advanced Engineering Informatics (Elsevier), DOI: 10.1016/j.aei.2024.102607.

Partial Discharge Classification in HV AC/DC Grids
Applied CNNs and SVMs to classify partial discharges in high-voltage AC/DC systems using both signal maps and rule-based flows.
Published in Sensors (MDPI), DOI: 10.3390/s23146317. Supervised related Bachelor's thesis.

OTHER ACTIVITIES

- Active member of the Sabuncu Lab Reading Group, discussing state-of-the-art deep learning topics such as foundation models, generative models, diffusion models, GANs, LLMs and more (2024–present).
- PoliTo Sailing Team — Dynamics Division (2017)
- Change the World Model UN, New York (2015)
- Scout Member (CNGEI)
- High School Student Council (2013–2015)

INTERESTS AND HOBBIES

I enjoy exploring nature through hiking, trekking, and amateur photography. I'm passionate about learning new languages and discovering different cultures. I regularly listen to podcasts, read articles, and watch documentaries—mainly about public policy, science, and geography. Studying is an important part of my life, and I genuinely enjoy learning. I'm naturally curious about everything. Physical activity is also crucial for me; I stay active through running and gym workouts. And, of course, I love traveling.

Looking ahead, I'm interested in starting volunteer work again—something I used to do during high school but haven't continued since. I'm also planning to enroll in an improvisation theatre course soon.

Links
linkedin.com/in/antonio-squicciarini github.com/antosquicciarini Portfolio