Antonio Squicciarini

Mechanical Engineer & Machine Learning Specialist — Signal Processing — Information Theory

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antosquicciarini

Profile

Mechanical Engineer and Machine Learning Specialist with expertise in malfunction detection using machine learning algorithms and deep learning optimization theory. Experienced in deep learning, signal processing, information theory, and applied research.

Technical Skills

Programming: Python, R, MATLAB
AI tools: TensorFlow, PyTorch
Machine Learning: Deep Learning, Signal Processing, Kernel Methods, Anomaly Detection
Tools: Git, LaTeX, Jupyter, LaTex, SolidWorks, Ansys Mechanical, NX siemens, FlexSim, Automation Studio

Education

PhD in Mathematical Engineering, Statistics and Optimization (IMEIO Doctoral Program) 2021–2025
Joint program by Universidad Politécnica de Madrid (UPM) & Universidad Complutense de Madrid (UCM)
Thesis: *Design of Deep Learning Classification Algorithms based on Information and Complexity Metrics.*

Research Mobility – Cornell Tech, Cornell University (USA) 09–12/2024
Research Exchange at Sabuncu Lab

MSc in Mechanical Engineering – Politecnico di Torino 2018–2020
Final Grade: 110L/110

BSc in Mechanical Engineering – Politecnico di Torino 2015–2018
Final Grade: 110/110

Publications

• A. Squicciarini, T. Trigano, D. Luengo. **"Jensen-Tsallis Divergence for Supervised Classification under Data Imbalance"**, accepted for publication in *Machine Learning* (Springer), ECLM 2025 Special Issue. Forthcoming.

• A. Squicciarini, A. Zarzo, C. E. González-Guillén, J. M. Muñoz-Guijosa. **"Application of deep neural networks for automatic rub detection in aeroderivative gas turbines"**, *Advanced Engineering Informatics* (Elsevier), Vol. 62, Art. 102607, 2024. Q1. DOI: 10.1016/j.aei.2024.102607.

• A. Squicciarini, E. V. Toranzo, A. Zarzo Altarejos. **"A time series feature extraction methodology based on multiscale overlapping windows, adaptive KDE, and entropic and information differentiable functionals"**, *Mathematics* (MDPI), Vol. 12, No. 15, Art. 2396, 2024. DOI: 10.3390/math12152396.

• C. Vera, A. Squicciarini, et al. **"Validation of a Qualification Procedure of Diagnostic Tools of PD Analysers in High Voltage GIS"**, *Sensors* (MDPI), Vol. 23, No. 14, Art. 6317, 2023. DOI: 10.3390/s23146317.

Work Experience

Researcher in ML/Data Analysis (UPM) 2020–2022
Designed and implemented ML algorithms for high-voltage partial discharge diagnosis.

Conference & Workshop Contributions

SIAM MDS24 Conference — Atlanta, USA (07/2024)
Poster: *Entropic Information Functionals and Neural Networks Explainability*

9th ECM Congress — Seville, Spain (07/2024)
Seminar: *Adaptive Bandwidth Selection for Anomaly Detection*

MISC'24 Workshop — Madrid, Spain (07/2024)
Poster: *Entropic Information Functionals for Event Detection*

III Workshop Junior Interdisciplinar — Madrid, Spain (02/2024)
Seminar: *Time Signal Anomaly Detection via Kernel Estimator*

BYMAD — ICMAT Madrid, Spain (11/2023)
Seminar: *EEG Seizure Analysis with Informational Measurements*

IX Iberian Modelling Week — Palma de Mallorca, Spain (07/2023)
Group Project: *Cryoablation Intervention Algorithm*

I Joint Workshop Functional Data Analysis — Miraflores de la Sierra, Spain (06/2023)
Seminar: *Informational Measurements for EEG*

Metrology for HV Transmission Workshop — Madrid, Spain (05/2023)
Poster: *Validation of PD Analysers for HVDC*

XV CIBIM Congress — Madrid, Spain (11/2022)
Seminar & Paper: *Deep Learning for Rub Detection*

INDUSTRIALES Research Meeting — UPM Madrid, Spain (04/2022)
Poster: *Synthetic Data for Rub Detection*

SIAM MDS22 Conference — San Diego, USA (09/2022)
Poster: *Synthetic Data for Neural Networks*

Certifications

• Microsoft Azure AI Fundamentals (2022)
• Expert in Quantitative Research Methodology (IEN-UPM/CSIC, 2022)
• Qualified Engineer, Italy (2020)

Leadership & Activities

• Change the World Model UN (New York, 2015)
• Scout Volunteer, CNGEI (Matera, 2012–2014)
• High School Student Representative (2013–2015)