Antonio Squicciarini

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

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antosquicciarini Portfolio

Profile

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

Technical Skills

Programming: Python, R, MATLAB
AI tools: TensorFlow, PyTorch
Machine Learning: Deep Learning, Signal Processing, Kernel Methods, Anomaly Detection
Tools: Git, LaTeX, Jupyter, SolidWorks, Ansys

Education

PhD IMEIO (UPM-UCM) 2021–2025
Thesis: ML Algorithms using Information Metrics for Event Detection.
Mobility - Cornell Tech (USA) 09–12/2024
Research Exchange at Sablab Group.
MSc Mechanical Eng. (PoliTo) 2018–2020
Grade: 110L/110
BSc Mechanical Eng. (PoliTo) 2015–2018
Grade: 110/110

Work Experience

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

Publications

• 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. Q1. DOI: 10.3390/math12152396.
• C. Vera et al. "Validation of a Qualification Procedure of Diagnostic Tools of PD Analysers...", *Sensors* (MDPI), Vol. 23, No. 14, Art. 6317, 2023. Q2. DOI: 10.3390/s23146317.
• A. Squicciarini, T. Trigano, D. Luengo García. "Jensen-Tsallis Divergence for Supervised Classification under Data Imbalance", submitted to *Machine Learning* (Springer), 2024.

Leadership & Activities

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

Research Experience

SIAM MDS24 Conference (Atlanta, USA)
Poster: Entropic Information Functionals and Neural Networks Explainability (07/2024)
9th ECM Congress (Seville, Spain)
Seminar: Adaptive Bandwidth Selection for Anomaly Detection (07/2024)
MISC'24 Workshop (Madrid, Spain)
Poster: Entropic Information Functionals for Event Detection (07/2024)
III Workshop Junior Interdisciplinar (Madrid, Spain)
Seminar: Time Signal Anomaly Detection via Kernel Estimator (02/2024)
BYMAD (ICMAT Madrid, Spain)
Seminar: EEG Seizure Analysis with Informational Measurements (11/2023)
IX Iberian Modelling Week (Palma de Mallorca, Spain)
Group Project: Cryoablation Intervention Algorithm (07/2023)
I Joint Workshop Functional Data Analysis (Miraflores de la Sierra, Spain)
Seminar: Informational Measurements for EEG (06/2023)
Metrology for HV Transmission Workshop (Madrid, Spain)
Poster: Validation of PD Analysers for HVDC (05/2023)
FuzzyMAD Workshops (UCM Madrid, Spain)
Participation (11/2023 and 12/2022)
IMEIO OptiMad2023 (Madrid, Spain)
Participation (11/2022)
IMEIO DecData2022 (UCM Madrid, Spain)
Seminar: Transfer Learning for Fault Detection (11/2022)
XV CIBIM Congress (Madrid, Spain)
Seminar and Paper: Deep Learning for Rub Detection (11/2022)
INDUSTRIALES Research Meeting (UPM Madrid, Spain)
Poster: Synthetic Data for Rub Detection (04/2022)
SIAM MDS22 Conference (San Diego, USA)
Poster: Synthetic Data for Neural Networks (09/2022)

Certifications

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