FARNOUSH **SHAMSAZAD**

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Electrical Engineer with dual Master's degrees and a strong academic foundation in power electronics and intelligent fault diagnostics. My research interests lie at the intersection of AI and power conversion systems, with a particular focus on applying deep learning techniques to improve reliability, monitoring, and prognostics of converters. I am especially motivated by the potential of combining data-driven models with domain knowledge to develop robust solutions for real-world, mission-critical systems.

EDUCATION

MASTER'S DEGREE IN ELECTRICAL ENGINEERING

Pavia University. Pavia, Italy__ Oct 2022 – March 2025_ GPA 95/110
Thesis: "A Comparative Analysis of 1-D Convolutional Transformer Hybrid Architectures for Deep Learning Fault Diagnostics in Cascaded H-Bridge Power Converters - Open Switch Faults"

- *Developing a deep learning model for fault diagnostics in PECs, incorporating reliability engineering principles.*
- *Focused on fault detection on CHB converters and predictive maintenance using experimental data.*

MASTER'S DEGREE IN ARCHITECTURAL ENGINEERING

Science and Research Branch of Azad University. Tehran, Iran __ Oct 2015 – Jan 2019
Thesis: "Indoor Aquatic Sports Complex Design with Sustainable Architecture Approach"
GPA 17/20

BACHELOR'S DEGREE IN ELECTRONICS ENGINEERING

Saveh Branch of Azad University. Iran __ Oct 2006 – Aug 2010
Thesis:" Design and Implementation of a Standalone Solar PV System for Rural Electrification"
GPA 14/20

PUBLICATIONS

- F. Shamsazad, S. Rokocakau, A. Volpini, G. Tresca and P. Zanchetta, "A Data-Driven Fault Diagnostics Approach for Dual Active Bridge Converters," 2025 IEEE Industry Applications Society Annual Meeting (IAS), Taipei, Taiwan, 2025, pp. 1-8, DOI: 10.1109/IAS62731.2025.11061511.

- S. Rokocakau, G. Tresca, F. Shamsazad, P. Zanchetta, G. Cirrincione and M. Cirrincione, "An Optimized Rotational Position Encoding for 1-D Convolutional Transformer Hybrid Neural Network Fault Diagnosis on Power Converters," 2025 IEEE Industry Applications Society Annual Meeting (IAS), Taipei, Taiwan, 2025, pp. 1-7, DOI: 10.1109/IAS62731.2025.11061433.

- S. Rokocakau, F. Shamsazad, G. Tresca, P. Zanchetta, G. Cirrincione, and M. Cirrincione, "Positional Embedding Comparison for Improved 1-D Convolutional Transformer Hybrid Neural Network Fault Diagnosis on Power Converters," To be presented at the IEEE Energy

Conversion Congress and Exposition (ECCE 2025), Philadelphia, PA, USA, October 19–23, 2025.

- S. Cossu, F. Shamsazad, S. Rokocakau, G. Tresca, and P. Zanchetta, "A Novel Grid Impedance Estimation Method for Grid-Connected Inverter Systems Using LSTM Neural Networks," To be presented at the IEEE Energy Conversion Congress and Exposition (ECCE 2025), Philadelphia, PA, USA, October 19–23, 2025.

- F. Shamsazad and V. Fooladi, "Assessment of Thermal Comfort in Vernacular Buildings in the Cold and Mountainous Region (Case Study: Hamadan, Iran)," International Journal of Architecture and Urban Development (IJAUD), May 2022. DOI: 10.30495/IJAUD.2022.18977

RESEARCH EXPERIENCE

April 2025 – September 2025

RESEARCH IN PE LAB,

- *Worked as a research assistant in a power electronics lab of university of Pavia.*
- *Worked on fault diagnostics in CHB converters.*
- *Worked on different ML methods in DAB and grids.*

WORK EXPERIENCE

FREELANCE ENGINEER, TEHRAN

- *Collaborated with my thesis professor on projects utilizing advanced software tools, including Python, to implement design optimizations in architectural planning.*
- *Developed Python-based algorithms for lifecycle prediction of components in building systems.*
- *Collaborated on AI-driven optimization in architectural and energy systems using advanced modeling tools (**Honeybee and Ladybug Tools**).*

Nov 2015 – Aug 2019

CO-DESIGNER, DONYAY-E-AREZOO CONSULTING ENGINEERS , TEHRAN

- *Conducted energy efficiency analyses with simulations, focusing on optimizing systems for sustainable building designs.*

Nov 2011 – Apr 2015

ELECTRICAL ENGINEERING, SHABAKEH PARDAZAN, TEHRAN

- *Worked in a team focused on the repair of electronic boards, gained foundational experience in electronic systems, emphasizing an analytical approach.*

SKILLS

- **Programming and Data Analysis:** *Python (Machine Learning, Data Science), MATLAB, R.*
- **Power Electronics and Simulation:** *PLECS, MATLAB/Simulink, Fault Diagnostics in PECs.*

- **Artificial Intelligence:** *Deep Learning (LSTM, CNN, RNN), Physics-Informed Machine Learning.*
- **Software and Tools:** *AutoCAD, Revit, Rhino (Grasshopper), MS Office.*
- **Languages:** *English: IELTS 6.5 (Listening 6.5, Speaking 7, Reading 6, Writing 6).*

CERTIFICATES

Jul 2024, **Online**
17-hour course on "The Git & GitHub Bootcamp"
APR 2024, **Online**
23-hour course on "Deep Learning A-Z 2024: Neural Networks, AI"
Feb 2024, Online
11-hour course on "R Programming A-Z™: R For Data Science With Real Exercises"
Nov 2023, **Online**
43-hour course on "Machine Learning A-Z: AI, Python & R" .
Feb 2023, **Online**
57-hour course on "100 Days of Code: The Complete Python Pro Bootcamp"

REFERENCES

Dr. Pericle Zanchetta, Professor
Department of Electrical, Computer and Biomedical Engineering , University of Pavia ,
*Email: **pericle.zanchetta@unipv.it**, Phone Number: +39 382 985208.*

Dr. Giulia Tresca , PhD
Department of Industrial and Information Engineering, University of Pavia,
*Emai: **giulia.tresca@unipv.it**, Phone Number: +39 0382985215.*