FAHAD ALI SARWAR

Ph. D. | Electrical Engineer | Software and System Modelling

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SUMMARY

Electrical Engineer with a PhD in Electronics and expertise in microgrids, smart grids, advanced energy management systems, and control strategies for renewable energy applications. Experienced in MATLAB/Simulink, Python, Linux system administration, and embedded systems, with a strong background in hydrogen-integrated power systems and multidisciplinary R&D projects. Skilled in modeling, simulation, system validation, troubleshooting, and technical support, with hands-on experience managing Linux-based environments and engineering software tools. Strong communicator with the ability to bridge research and industrial applications, provide technical training, and solve complex engineering challenges.

WORK EXPERIENCE

Research and Development Engineer at H2Gremm, France — **Aug 2020 - Present**

Hydrogen-Based Microgrid Modelling and HIL Validation

- Developed MATLAB/Simulink model of hydrogen-enabled building microgrid
- Validated control algorithms using RT-LAB HIL platform
- Integrated battery, PV, electrolyzer and fuel-cell systems

Key Technologies and skills: Microgrid Modelling, MATLAB/Simulink, HIL testing

Reinforcement Learning-Based Energy Management System

- Designed reinforcement learning controller for microgrid dispatch optimization
- Evaluated performance under varying renewable generation and load conditions

Key Technologies and skills: Machine Learning, Control and optimization

Embedded Linux Edge Control Platform

- Developed a Linux-based edge control unit for remote monitoring and control applications.
- Implemented secure remote connectivity through VPN services.
- Configured DHCP networking services and database integration.
- Developed visualization and monitoring tools for system diagnostics and operation

Key Technologies and skills: Industrial automation, Edge computing, Linux, VPN, DHCP, Databases

Machine Learning Intern at Adeunis, Grenoble, France — **Feb 2019 - Dec 2020**

- Developed an IoT-based predictive maintenance system for industrial machinery.
- Built anomaly detection and ML models to predict HVAC motor failures and optimize maintenance schedules.

EDUCATION

Industrial Ph. D. in electronics — **Nov 2022 - May 2025**

University of Bordeaux | ESTIA-Research (France)

- Thesis: Innovative self-optimizing control of building microgrids exploiting hydrogen multiple services potential
- Department of Electronics

Masters in Energy for smart cities — **Sep 2017 - Sep 2019**

EIT InnoEnergy Masters School

- Dual Degree with KTH Royal Institute (Sweden) and Grenoble INP- ENSE3, Grenoble, (France)
- National School of Energy, Water and Environment

Bachelors in Electrical Engineering — **Aug 2013 - Aug 2017**

National University of Science and Technology, Pakistan

- Electrical Engineering
- School of Electrical Engineering and Computer Science (SEECS, Pakista)

FIELD OPERATIONS

- Provided onsite and remote support for hydrogen generation and refueling systems.
- Delivered product demonstrations at international trade fairs.
- Collaborated with multidisciplinary teams across Europe and South America.

SKILLS AND EXPERTISE

Techincal

- MATLAB/Simulink
- Python/C
- Linux Administration
- MG modelling
- SCADA and HMI
- Docker/Git
- Cybersecurity
- IoT and embedded communication

Language

- Urdu (Native)
- English (Fluent)
- French (A2)

PUBLICATIONS

RESAERCH PAPERS

1. Sarwar, F. A., Hernando-Gil, I., Vechiu, I., Latil, S., Baudoin, S., & Gu, C. (2022).Design and Feasibility Studyof Hydrogen-Based Hybrid Microgrids for LV Residential Services. In Proceedings of 2022 IEEE PESInnovative Smart Grid Technologies ConferenceEurope, ISGT-Europe2022(Vol. 2022-October). IEEE. https://doi.org/10.1109/ISGT-Europe54678.2022.9960566
2. Sarwar, F. A., Hernando-Gil, I., Vechiu, I., Driss,I., & Baudoin, S. (2023).Mobile Hydrogen Refueling Station: A CaseStudyof H2 E-Mobility on Ouessant Island. Proceedings of the 2023 IEEEPES Innovative Smart Grid TechnologiesConference Europe (ISGT-Europe). IEEE. https://doi.org/10.1109/ISGTEUROPE56780.2023.10407757
3. Sarwar, F. A., Hernando-Gil, I., & Vechiu, I. (2024).Review of energymanagement systems and optimizationmethods for hydrogen-based hybrid building microgrids. *Energy Conversion and Economics*, 5(4),259–279.https://doi.org/10.1049/enc2.12126

BOOK

1. Python Ethical Hacking from Scratch: Think like an ethical hacker, avoid detection, and successfully develop, deploy, detect, and avoid malware.

Link: https://www.packtpub.com/en-tw/product/python-ethical-hacking-from-scratch-9781838829506