Marwa Ben Ali
Ph.D. in Electrical Engineering

Academic Background

09.01.2018-05.02.2022
Ph.D. - Laboratory of Electrical Systems and Renewable Energies (LSEER) - National Engineering School of Sfax (ENIS) and the National Engineering School of Gabes (ENIG).
Degree: Very Honorable.
Level of Study: High Education.

2016
National Engineering Diploma (Electrical and Automation Engineering) –National School of Engineering of Gabes (ENIG).
Level of Study: High Education.

2013 – 2016
Studied automatic Electrical Engineering at the National School of Engineering of Gabes (ENIG).

2013
Passed the national exam for admission to engineering schools.

2011- 2013
Went to preparatory school of engineering (Physics/Chemistry) at the faculty of Science in Monastir.

2011
Baccalaureate Diploma.
Level of Study: Baccalaureate.

Professional Experience

10.2023-Present: Postdoctoral Research Fellow| Sustainable Manufacturing (Full Time)
Sustainable Manufacturing Lab, Free University of Bozen · Bolzano, NOI Techpark, Brunico
- Sustainable mobility project, energy monitoring, Sustainable and Human-Centred SMEs.
- Project Management: EtD-FaM-Project: The overall objectives of the EtD-FaM-Project is to contribute to the Ethiopian and Djibouti government efforts in realising the gender equality at HE level and industries. The Ethiopian Project partners together with the Djibouti Project partners intend to support their governments in their efforts to achieve the Sustainable Development Goals (SDGs), the Continental Education Strategy for Africa (CESA) in its guiding principles as well as the Common Market for Eastern and Southern Africa (COMESA) objectives.
- Leading a team of PhD and master students.

09.2022- 09.2023 : Teaching Assistant (Full Time)
Electrical department, Higher Institute for Industrial Systems of Gabes (ISSIG), University of Gabes.

2019 –2022: Teaching Assistant (Part Time)
Electrical department, National Engineering School of Sfax (ENIS), University of Sfax:
- Teaching practical work sessions.
- Design of the practical work booklet.

- Definitions and presentations of materials and work plan.
- Investigate any problems, analyze defects, and do preventive actions for systems.
- Assignment of marks to students.
- Supervision of students during exams.

2022-2023 (semester 1): Electrical installation of residential buildings: 13h
Class: civil engineering.
2021-2022 (semester 2): Electrical Technology: 117h
Class: electrical engineering
2021-2022 (semester 1): Electrical installation of residential buildings: 13h
Class: civil engineering.
2020-2021 (semester 2): Electrical Technology: 65 h
Class: electrical engineering
2020-2021 (semester 1): Electrical installation of residential buildings: 13h
Class: civil engineering.
2019-2020 (semester 1): Electrical installation of residential buildings: 13h
Class: civil engineering.
2018-2019 (semester 2): Electrical Technology: 39 h
Class: electrical engineering

Language Skills

Arabic: Mother Tongue
English: Excellent
French: Excellent

Tools

- **Technical Expertise**

Research
WORD, EXCEL, ACCESS, PowerPoint, Power BI.
Matlab, Matlab/Simulink, Python, PSIM, Osemosys.
Arduino, STM32.
Optimization Tools: PSO, APSO, Fmincon, Génitique, convex among others.

- **Interpersonal skills:**

Communication and Leadership, Problem Solving, Project Management and coordination.
Able to work in Multi-Cultural Environment, Team Oriented and Cooperative.

Achievements: Publications and Communications

<center>**Published/Accepted Articles:**</center>

[1] Marwa Ben Ali, and Erwin Rauch. 2024. "Sustainable Mobility Transition: A SWOT-AHP Analysis of the Case Study of Italy" Sustainability 16, no. 11: 4861. https://doi.org/10.3390/su16114861.

[2] Marwa Ben Ali, and Erwin Rauch, The Influence of Electric Vehicle Technologies on Environmental Sustainability in Industrial Reporting: A Bibliometric Study, 3rd International Symposium on Industrial Engineering and Automation Latest Advancements In Mechanical Engineering 19th-21st June 2024, Bozen-Bolzano, Italy.

[3] Leila Zare, Marwa Ben Ali, and Erwin Rauch, Industry 5.0 and SMEs Future Work Competency Fields: A Literature Review, 3rd International Symposium on Industrial Engineering and Automation Latest Advancements In Mechanical Engineering 19th-21st June 2024, Bozen-Bolzano, Italy.

[4] Fucci Fekadu, Marwa Ben Ali, and Erwin Rauch, Development of an IoT-enabled Energy Monitoring and Energy Flow Analysis Model for SMEs: A Case Study, 10th 2024 International Conference on Control, Decision and

Information Technologies (CoDIT 2024), 01-04 July, 2024 at Valetta, Malta.

[5] Marwa Ben Ali, Erwin Rauch, and Dominik Matt, Exploring the Synergy of Digitalization and IoT: A Literature Review on Energy Monitoring for SMEs, 10th 2024 International Conference on Control, Decision and Information Technologies (CoDIT 2024), 01-04 July, 2024 at Valetta, Malta.

[6] Leila Zare, Marwa Ben Ali, and Erwin Rauch, Challenges and opportunities in integrating human-centric artificial intelligence solutions in industry, 4th EurOMA CEE Research Network Workshop 2024 & 17th EPIEM Conference 2024.

[7] Leila Zare, Brian Walter Benedini, Marwa Ben Ali, Erwin Rauch, and Sergio Salimbeni, Opportunities and Barriers for Implementing Human-Centric Manufacturing in SMEs: Results from Focus Group Workshops in Argentina, International Conference on Industry 4.0 and Smart Manufacturing Prague - Czech Republic 20-22 November 2024.

[8] Marwa Ben Ali, Lars Jakobs, Reda Makeda Fasil, Angelika Hofer, and Erwin Rauch, Empowering Female Academics: A Needs Analysis Study in Ethiopia and Djibouti Universities, 27th International Conference on Interactive Collaborative Learning, 53rd IGIP International Conference on Engineering Pedagogy, 24–27 September 2024, TalTech, Tallinn, Estonia.

[9] Lars Jakobs, Marwa Ben Ali, Reda Makeda Fasil, and Erwin Rauch, European Best Practices: Makerspaces and Fablabs for fostering Education and Carrer in Ethiopia and Djibouti, 27th International Conference on Interactive Collaborative Learning, 53rd IGIP, International Conference on Engineering Pedagogy, 24–27 September 2024, TalTech, Tallinn, Estonia.

[10] Marwa Ben Ali, Lars Jakobs, and Erwin Rauch, SME 5.0 - Why Digital Transformation is An Enabler For Sustainable Development Within Industry 5.0, Poster presentation, ESOF2024 conference, Life changes science, 12–15 June 2024, Katowice, Poland.

[11] Katherin Salamanca Cano Angie, Marwa Ben Ali, and Erwin Rauch, Challenges and Opportunities in Life Cycle Assessment for Precast Concrete Production: A Case Study, International Conference on Industry 4.0 and Smart Manufacturing Prague - Czech Republic 20-22 November 2024.

[12] Ben ALI, Marwa et BOUKETTAYA, Ghada. Analysis of barriers and opportunities in the transition towards sustainable electric mobility in Tunisia: An experimental survey. Research in Transportation Business & Management, 2023, vol. 50, p. 101022.

[13] ELLOUMI Mariem, BEN ALI Marwa, Kallel Randa, and BOUKETTAYA Ghada, Combined Optimal Sizing and Energy Management of a Hybrid PV-Battery Production System into Smart Home Application with Plug-in hybrid Electric Vehicle, Energy Systems.

[14] BEN ALI, Marwa, et BOUKETTAYA, Ghada. Urban Transport Solutions for a Sustainable and Smart Mobility Future: Macro-Environmental Analysis. Book chapter Smart Cities for Sustainability: Approaches and Solutions, Emerald publishing.

[15] BEN ALI, Marwa, and BOUKETTAYA, Ghada and ABBES, Dhaker. Classical Boolean and Fuzzy Logic Energy Management Strategies for a Parallel HEV Powertrain System, International journal of computing digital systems (IJCDS), 2021.

[16] BEN ALI, Marwa and BOUKETTAYA, Ghada. Optimal energy management strategies of a parallel hybrid electric vehicle Based on different offline optimization algorithms. International Journal of Renewable Energy Research (IJRER), 2020, vol. 10, no 4, p. 1621-1637.

[17] BEN ALI, Marwa, et BOUKETTAYA, Ghada. JAYA Optimization Algorithm for Solving Economic Problem: Efficient Algorithm for the Electric Automotive Applications. 1st International Conference on Trends and Innovations in Smart Technologies (ICTIST), London, UK, October 7-8, 2022

[18] BEN ALI, Marwa, and BOUKETTAYA, Ghada. Evaluation of the Consumer's Intention to Shift to Electric Transportation System in Tunisia. Conference paper. Journées écoles doctorales Sciences et technologies (JEDST) 2022 – ENIS, Sfax, Tunisia – May 20 - 22, 2022.

[19] BEN ALI, Marwa, and BOUKETTAYA, Ghada. EV or CV? Are Tunisian Consumers willing to shift to Electric Mobility Systems?. (Poster). Journées écoles doctorales Sciences et technologies (JEDST) 2022 – ENIS, Sfax, Tunisia – May 20 - 22, 2022.

[20] BEN ALI, Marwa, and BOUKETTAYA, Ghada. A Review of Factors Influencing the Adoption of Electric Vehicles in the World. 19th International Multi-Conference on Systems, Signals & Devices (SSD2022) - Conference on Power Systems & Smart Energies, May 06-10, 2022 Faculty of Technology, University Ferhat Abbas Setif 1, Algeria.

[21] BEN ALI, Marwa, and BOUKETTAYA, Ghada. Integrating PESTEL and Fuzzy Logic Methods for Risk Management Process—Case of Electric Mobility Transition in Tunisia. International Conference on Ecological Innovation, ECONOV'22, 7 to 9 May 2022 at Sousse – Tunisia.

[22] BEN ALI, Marwa and BOUKETTAYA, Ghada. Effect of Optimal Energy Management Strategy on Parallel Hybrid Electric Vehicle Performances. In: 2021 18th International Multi-Conference on Systems, Signals & Devices (SSD). IEEE, 2021. p. 1099-1106.

[23] BEN ALI, Marwa, BOUKETTAYA, Ghada, and ELLOUMI, Mariem. "Modelling, Control, and Simulation of Parallel PHEV Powertrain System", 4th International Conference on Recent Advances in Electrical Systems, Hammamet, Tunisia, pp. 53-58, 23-25 December 2019.

[24] BEN ALI, Marwa, ELLOUMI, Mariem, and BOUKETTAYA, Ghada. Review on optimization algorithms for plug in hybrid electric vehicle. In: 2019 19th International Conference on Sciences and Techniques of Automatic Control and Computer Engineering (STA). IEEE, 2019. p. 134-139.

Others

[25] Electric Mobility Transition Project in the Arab Region: Are Citizens Ready to Shift to Electric Vehicles?| Keynote by Marwa Ben Ali, EIT Urban Mobility marketplace.

Additional Information

Internship

01.03.2020 - 30.04.2020: "Research Internship" Grant from the Ministry of Education and Research (2020). Laboratory of Electrical Engineering and Power Electronics of Lille (L2EP),Univ. Lille, Arts et Metiers Institute of Technology, Centrale Lille, Yncrea Hauts-de-France, ULR 2697 -L2EP, F-59000 Lille, France.

- Occupation and Tasks

Ph.D. Student

In this internship period, I was focused on the study of the model, control, supervision, and optimization of the overall traction system (driver, chassis, motor, bus…) of a mid-size hybrid electric vehicle (HEV) with parallel architecture using the MATLAB/SIMULINK software. HEV is made up mainly of an electric motor (EM) and an internal combustion engine (ICE). EM is used as a main propulsion system for the vehicle. However, the ICE is used as a backup system.

This study was developed to manage the power split between the two energy sources by ensuring a balance between the generated and consumed powers, injected or absorbed into the Lithium-ion battery and minimizing the ICE operation to reduce the total cost of its displacement in hybrid mode and reduce fuel consumption and CO_2 emissions using optimization methods under different normalized drive cycles (NEDC, ARTEMIS…).

02.02.2016 - 25.05.2016: Laboratory for Analysis, Conception and Control of Systems at the National School of Engineering of Tunis (ENIT)

- Occupation and Tasks

Internship for the Final Year Project: Digital Control of a thermal system

- o   Matlab simulation on different controllers: PID, PI, MPC.
- o   Modeling of Thermal System.
- o   Thermal control system by the PI controller and MPC via an Arduino Uno card preceded by a test on RC circuit.

21.06.2015 - 17.07.2015: Industrial Company ELEONETECH (OneTECH Group), Bizerte, Tunisia

- •   Occupation and Tasks

Technician: Test database creation department Internship

- o   Created a Database of testers on Access.
- o   Performed test operations on cards to make.
- o   Did the TEST department Inventories.

01.08.2014 - 31.08.2014: Tunisian Company for Electricity and Gaz

- •   Occupation and Tasks

Worker Internship

- o   General visits.
- o   Participated in daily maintenance missions.

Training

19-02-2023
ISO 45001 - Occupational Health & Safety management system.
Institute: Udemy

14-18 November 2022
Graduate Level "Short Course: Dynamics of low-carbon power systems 2022.
Institute: Melbourne Energy Institute, University of Melbourne.

29-30 November, 1 and 5-6-7 December 2022
MICRO GRID ACADEMY Online training: Decentralized Renewable Energy, System Design, Operation & Maintenance and Safety
Institute: RES4Africa Foundation

24.09.2022-25.09.2022-02.10.2022
ISO 31000: Risk Management
Institute: The network of Tunisian Engineers « RIT» and the training center «Genuvers ».

 13.06.2022-17.06.2022
One-week Short Term Course (STC) on "Advanced Control of Standalone Energy Systems"
Institute: Department of Electrical Engineering, National Institute of Technology Srinagar Hazratbal, Srinagar, Jammu & Kashmir, India

04.03.2022-25.03.2022
PMP EXAM PREPARATION TRAINING.
Institute: Ben Hamouda Consulting

16.03.2022-17.03.200
Python
Institute: Higher School of Computer Engineering and Technology ESGITECH

17.03.2022
Les fondamentaux de l'agilité & scrum Online Course.
Institute: Udemy

27.2.2022
Energy and Flexibility Modelling course.
Institute: Climate Compatible Growth CCG.

21.02.2022

Project Management for Beginners
Institute: Project Management Institute

17.02.2022
Free Introduction: Basics of Disciplined Agile™ Online Course
Institute: Project Management Institute

23.12.2021-25.12-2021
Python
Institute: Orange Tunisia

07.12.2021
Scrum Master Certified (SMC™)
Institute: SCRUMstudy - Accreditation Body for Scrum and Agile.

03.12. 2021
Scrum Fundamentals Certified (SFC™)
Institute: SCRUMstudy - Accreditation Body for Scrum and Agile.

25.09.2021-26.09-2021
SCRUM MASTER training & "Scrum Master Certified (SMC) exam preparation ".
Institute: Ben Hamouda Consulting in association with SCRUMstudy.

23.09.2021-24.09.2021
"INDUSTRY 4.0 USER YELLOW BELT" training
Institute: Sfax industry 4.0 center

01.12.2018
Institute: University of Kassel, Germany and University of Sfax, Tunisia (ENIS)
5th international workshop on electric and hybrid automotive technologies (WAT2018) and the renewable energy and energy efficiency in the Middle East and North Africa region (REEE- MENA2018).

27.02.2017
APTIS Exam (B1)
Institute: BRITISH COUNCIL

24.12.2016
Communication, entrepreneurship and employment.
Institute: WEYOUTH ORGANIZATION

29.03.2016
TOEIC Exam (total score: 615)
Institute: AMIDEAST

29.03.2016
Arduino software
Institute: C.S.F industrial training.

Supervision Experience

- Co-supervising 1 Final Year Project at undergraduate level (Electrical Engineering), ENIS, 2022:
Project titled: Mise en place d'une plateforme d'essai pour une application BMS dédiée au véhicule électrique

- Co-supervising 2 study projects (Master), UNIBZ, 2023/2024:
Study project titled "Development of an IoT-enabled Energy Monitoring and Energy Flow Analysis Model for SMEs," which was presented on February 23, 2024.
Study project "Needs Analysis and Concept Design for Female Makerspaces for Educational Use as well as Ex-curriculum Use" will be presented on 30.06.2024.
- 2 PhD students, UNIBZ, 2024.

Awards/scholarships/invitations

- Member of the program committee: Conference session

Title: Makerspace - Training On Soft-skills and Entrepreneurial Thinking27th International Conference on Interactive Collaborative Learning 53rd IGIP International Conference on Engineering Pedagogy, 24–27 September 2024, TalTech, Tallinn, Estonia

- Session chair

10thConference on Control, Decision and Information Technologies (CoDIT 2024) at the University of Malta (UM), Valletta Campus, July 1-4, 2024.

International Conference on Intelligent Systems, Blockchain, and Communication Technologies (ISBCom), Egypt, July 13-14, 2024.

IEEE International Conference on Artificial Intelligence, Blockchain, and Internet of Things (AIBThings) organized by Central Michigan University (CMU), USA.

- keynote Speaker

Analysis of Barriers and Opportunities in the Transition to Electric technology toward a sustainable urban mobility future., presented on 10/10/2022 as part of a lecture series on "ATAL Faculty development programme on micro grid an opportunity: electric vehicles and renewable energy resources" sponsored by AICTE during October 10–21, 2022 at the Dayalbagh Educational Institute (Deemed University), Agra, India.

- Award

Fully funded research internship Grant from the Ministry of Education and Research (2020) from University of Gabes and Government of Tunisia (01.03.2020 - 30.04.2020).

Professional Memberships

Registered Engineer, Tunisian Engineering Council, Sfax Tunisia.

Academic Services

Reviewer:
International journal of computing and digital systems (IJCDS).
Journal of Energy Engineering-ASCE.
The 6th International Conference on Computer Science and Application Engineering (CSAE 2022).
IEEE Access journal.
Elsevier: Journal of Building Engineering
10thConference on Control, Decision and Information Technologies (CoDIT 2024)
3rd International Conference on Computing, IoT and Data Analytics (ICCIDA 2024)