Mohamed Rayan Barhdadi

Doha, Qatar

Electrical Engineering Student | LinkedIn | Website

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Research Interests

I am keen on doing research in data centered AI and machine learning. I am open to working on any project related to these areas.

Education

Texas A&M University, Qatar Campus — Aug 2023-Present
Bachelor of Science with Honors — Graduation: May 2027 (expected)
Specialization: Electrical Engineering with minor in Mathematics
Award: Engineering Honors Program

ELARAKI International School, Marrakech, Morocco — Sept 2020-June 2023
Baccalaureate with Distinction (French) - Physical Sciences

The American Academy, Salt Lake City, Utah, USA — Sept 2020-June 2023
American High School Diploma with Honors - Pursed online simultaneously with my baccalaureate.

Research Experience

Research Collaborator, Undergraduate Research Experience Program — Dec 2024-Present
Qatar Research, Development and Innovation Council

- Leveraging data analytics methods, including machine learning, and other methods, to interpret historical Dissolved Gas Analysis (DGA) data to improve fault detection and transformer condition monitoring.
- Leading a 1-year research project focused on data analytics for interpreting transformer DGA.

Undergraduate Research Assistant, with Dr. Selma Awadallah — Feb 2023-Present
Electrical and Computer Engineering Department, Texas A&M University
Dissolved Gas Analysis for Transformers

- Managed project that focused on Dissolved Gas Analysis (DGA) for transformers, aiming to create a publicly accessible DGA monitoring database.
- Created and managed a specialized SQL database using MySQL for DGA data analysis, and authored a comprehensive user guide for it.
- Collected and analyzed data from over 1,000 samples across 900+ oil-filled transformers for detailed DGA analysis, also processed and cleaned it for ready use.
- Created +10 Python and SQL scripts for specific data extraction within the database.
- Effectively worked with XAMPP and phpMyAdmin for remote DB access and management.
- Conducted in-depth literature reviews and composed detailed research report.

Mentor/Assistant, High School Research Experience Program — Feb 2023-Oct 2024
Qatar Research, Development and Innovation Council in collaboration with Texas A&M University
Effect of Heat on Solar Panel Efficiency Project

- Mentored two selected high school students in their research projects focused on the effect of heat on solar panel efficiency in Qatar across different seasons.
- Conducted and supervised weekly data collection using the HOBO monitoring device and sensors to track on temperature, wind speed, direction, and solar radiation. Over the span of 8 months.

Other Experience

Qatar Foundation - Student Housing, *Front Desk Assisstant* — Nov 2024-Present
TAMUQ - Marketing and Communications Department, *Student Assistant* — Oct 2024-Present
Izu Studio - Motion Design Agency, *Founder & Motion Designer* — June 2020-Aug 2024
LAMALIF Group - Information Technology and Finance Department, *Intern* — Summer 2020

Technical Skills

Programming Languages, Tools, Frameworks, Concepts:

- Python (NumPy, SymPy, SciPy, Matplotlib, Pandas, Seaborn), SQL, C Language, Verilog HDL, HTML, CSS.
- Intel Quartus II, Jupyter NoteBook, MySQL Workbench, HOBOlink, XAMPP, phpMyAdmin, MobaXterm, Blender, LaTex, Microsoft Suite (Excel, Word, PowerPoint, VS Code), Adobe Suite (After Effects, Media Encoder, Photoshop, Illustrator).

Projects

ECEN 248 - Hexadecimal 7-Segment Synthesizer with Dr. Hussein Alnuweiri — Fall 2023

- Designed a Fan-In Constrained Hexadecimal Synthesizer integrated into a 16-bit counter system.
- Systematically optimized logic circuits using Karnaugh maps and Boolean algebra, achieving a 33% reduction in gate count, and hardware requirements while maintaining circuit accuracy and functionality.
- Developed unoptimized and optimized versions of the 7-segment decoder; rigorously tested functionality and quantified performance improvements in propagation delay and resource utilization.
- Introduced advanced techniques to minimize logical overlaps and maximize circuit efficiency, aligning with constraints on fan-in and hardware costs.

Poster Presentations

M. R. Barhdadi, advised by Dr. Selma Awadallah. *Transformer Monitoring: A Comprehensive Multidimensional Database for Dissolved Gas Analysis.* [Poster]. Presented at the Hamad Bin Khalifa University STEAM Showcase, 2024.

Selected Achievements

2024 Winner of Qatar Foundation Technology-Based Ideas Pitch Competition – $11,000 investment.
2024 Awardee of the selective Undergraduate Research Experience Program (UREP 31-043-2-014) by Qatar Research Development and Innovation Council (QRDI) – $1,500.
2024 2nd Place Texas A&M University Qatar Robotics Competition.
2024 Lead Organizer and Mentor in "Effective Humanitarian Engineering Solutions Workshop".
2024 Successfully Completed: Machine Learning for Facies Classification Workshop by SLB.
2023 Successfully Completed: Engineering Asset Management in Power Grids Workshop.
2023 Inducted in Engineering Honors Program at Texas A&M-Q.

Leadership and Community Involvement

The Peace Club TAMU-Q, *President*	Spring 2025
The Peace Club TAMU-Q, *Vice-President*	Fall 2024
Qatar Foundation, *Student Orientation Leader*	Fall 2024
Qatar Foundation Convocation 24', *Student Volunteer*	Spring 2024
IEEE, *Student Member*	Fall 2023-Present
IEEE Student Chapter, *Class Representative*	Fall 2023-Spring 2024
Moroccan National Swimming Federation, *Instructor Volunteer*	Summer 2022

Language Proficiency

English (Full Professional Proficiency), French (Bilingual Proficiency), Arabic (Native), Darija (Moroccan Dialect - Native).

References

Dr. Hussein Alnuweiri
Professor of EE at TAMU Qatar, **Email:** alnuweiri@tamu.edu, **Tel:** (974) 4423-0264.

Dr. Selma Awadallah
Assistant Professor of EE at TAMU Qatar, **Email:** selma.awadallah@tamu.edu, **Tel:** (974) 4423-0408.