NAJIYA OMAR

PhD, P.Eng

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PROFESSIONAL SUMMARY

I am an experienced electrical engineer with a passion for leveraging big data for energy management system transformation. My area of expertise is in predictive analysis, optimization theory, and advanced technologies to create smart energy management solutions. With a deep understanding of energy consumption patterns, renewable energy sources, weather data, statistical modelling, and cutting-edge optimization techniques. I am interested in developing scalable technologies that enhance efficiency, reduce costs, and minimize environmental impact. My work involves integrating solar and other renewable resources to deploy machine learning algorithms for predictive modeling and system optimization.

PROFESSIONAL EDUCATION

Doctor of Philosophy: Electrical and Computer Engineering **2018 – 2023**
Dalhousie University Halifax NS
Thesis Title: Enhanced performance of solar irradiance prediction using deep learning and data mining techniques

- Best Oral Presentation in IEEE-CEEPE (2021)
- FGS Allocation – Scholarship (2019, 2021)
- Bruce and Dorothy Rosetti Engineering Research (2020)
- Engineering Excellence Award Scholars (2019, 2020)

Master of Applied Science: Electrical and Computer Engineering **2014 – 2017**
Dalhousie University Halifax NS
Thesis Title: Speaker identification system enhanced by optimized neural networks and feature fusion techniques evaluated by cochlear implant-like spectrally reduced speech

- Faculty Poster Award Second Prize, ECE Graduate Conference (2016)
- FGS Allocation – Scholarship (2015)

Bachelor in Electrical and Electronics Engineering with Distinction **1999 – 2004**
Sirte University, Sirte Libya
Final year project: Using Neural Networks for Modeling an Electric Cardio Graph (ECG)

- Academic Excellence Award

PROFESSIONAL EXPERIENCE

RESEARCH FELLOW **2022-2023**
Green Power Labs Inc

- Optimized the data downloads by writing a code utilizing "GOES-2-Go" and s3fs python libraries to access the NOAA's GOES-16 geostationary satellite dataset that is stored as netCDF files in Amazon Web Services (AWS)/ S3 Bucket.
- Automated downloaded GOES-16 satellites images from different channels of the Advanced Baseline Imagery (ABI) instrument with different temporal and spatial resolutions, and map projections.
- Utilized the GOES-16 cloud products including Cloud Optical Depth , Clear Sky Mask , Cloud-top products such as Cloud-Top Height, Cloud-Top Pressure , Cloud-Top Temperature, Cloud Top Phase, and Cloud Particle Size for proposing Could Index (CI) dataset.
- Applied a map projection that positioned all the extracted variables from the ABI cloud products to the same projected grids.
- Selected appropriate thresholds and computing measurements for CI and prepared the obtained CI measurements to be used by the CI predictive algorithm.
- Employed the PVlib python package for calculating cloud irradiance components.

RESEARCH ASSISTANT **2018**
Nova Scotia Community College

- Developed and implemented experimental designs for data collection in Proteus DS simulation, utilizing skills in Matlab, resulting in improved accuracy and efficiency in data retrieval.
- Designed and implemented visualization solutions for inconsistencies in Remotely Operated Vehicles (ROV) simulation data, providing expertise in cleaning, organizing, and combining multivariate data for maximum utility.
- Conducted complex analyses of ROV data to determine feasible speed ranges for safe marine operations and determine capacity requirements of ROV thrusters, utilizing advanced graphing techniques and data visualization tools.
- Collaborated closely with team members, taking feedback and implementing changes to improve tool functionality and usability.

- Designed and maintained research databases and information systems, ensuring data integrity and accessibility for use in future research projects.

TEACHING ASSISTANT **2015,2016,2020,2021**

Dalhousie University

- Provided instruction and guidance to undergraduate students in Electric Circuits and Computer Programming courses, using hands-on examples and clear communication skills to provide one-to-one support.
- Demonstrated laboratory instruments, including prototype boards, oscilloscopes, and digital multimeters, to first-time users, ensuring an understanding of theoretical concepts and safe laboratory practices.
- Marked and corrected assignments and lab reports, providing feedback on errors in terms of principle electrical theories and programming concepts.
- Performed troubleshooting skills to help students understand C and C++ codes, identifying and resolving problems in the execution of code.
- Supervised the work of 30-40 undergraduate students, providing constructive feedback to help improve their performance.
- Invigilated and marked final tests, providing detailed reports to department staff for grading and record-keeping purposes.

ELECTRICAL ENGINEER **2009 – 2013**

Al-Mofida Company for Electrical and Electronics Projects, Sirte Libya

- Collaborated with a multidisciplinary team to successfully deliver government-funded energy projects with a budget of approximately $500,000, playing a key role in the projects' success.
- Leveraged sophisticated Artificial Neural Network (ANN) applications to accurately predict and estimate power consumption for government energy projects in Sirte, using advanced statistical metrics to evaluate algorithm performance and ensure accuracy rates that met or exceeded project requirements.
- Applied Machine Learning (ML) algorithms to classify datasets for pattern recognition tasks, using best practices in data management to streamline and optimize the data analysis process.
- Attended regular project meetings to provide up-to-date insights and outcomes, and skillfully managed the financial plan for each project, optimizing resource allocation and budgeting to meet project goals.

LAB ASSISTANT **2005 – 2006**

Sirte University, Libya

- Developed and prepared experiment procedures by conducting mathematical calculations and analyzing circuits for verification with laboratory workers.
- Investigated and organized lab equipment, including DC and Dual Power supply, Multimeter, and Wireless devices, prior to laboratory sessions for optimal use.
- Demonstrated the fundamentals of constructing electrical circuits, including resistors, op-amp, capacitors, and inductors, and measurements using voltmeters and ohmmeters to ensure student comprehension.
- Evaluated student performance in attendance, collaboration, attitudes, and efforts to provide constructive feedback for continuous improvement.
- Utilized new software technologies, such as Matlab, Labview, and CircuitLab, to enhance student understanding of circuit output through physical demonstrations.

PUBLICATIONS

- "Optimized Feature Selection Based on a Least-Redundant and Highest-Relevant Framework for a Solar Irradiance Forecasting Model," in IEEE Access (2022)
- “Seasonal Clustering Forecasting Technique for Intelligent Hourly Solar Irradiance Systems”, IEEE Transactions on Industrial Informatics (2022)
- “LSTM and RBFNN Based Univariate and Multivariate Forecasting of Day-ahead Solar Irradiance for Atlantic Region in Canada and Mediterranean Region in Libya”, IEEE-CEEPE (2021)
- “Optimizing Classifier Performance for Parkinson’s Disease Detection”, IEEE-CCECE (2017)
- “Feature Fusion Techniques Based Training MLP for Speaker Identification System”. IEEE-CCECE (2017)

CERTIFICATIONS

- Certificate in Engineering Teaching (IET)
- Member of Association of Professional Engineers of Nova Scotia (ENS)
- Member of the Institute of Electrical and Electronics Engineers (IEEE)
- Member of the Canadian Operational Research Society (CORS)

VOLUNTEER

- Reviewer, Springer Nature **2024 – present**
- Reviewer, IEEE Access Journal **2022 – present**
- Reviewer, CCECE-IEEE Conference **2017, 2022**
- The Atlantic Engineering Competition (AEC) **2019**
- Electrical and Computer Engineering Graduate Conference (ECEGC) **2016, 2017, 2019**
  Dalhousie University