Safia Babikir Bashir

United Arab Emirates | safia.bashir332@gmail.com | 00971566071817 | LinkedIn |Github| Portfolio

SUMMARY

Experienced electrical engineer with a growing expertise in machine learning. Seeking a machine learning position to leverage skills and make a positive impact on a dynamic team. Committed to continuous professional development and pursuing opportunities for personal growth and meaningful experiences.

EDUCATION

FourthBrain
Machine Learning Engineer Program **Oct 2022-Feb 2023**
Abu Dhabi, UAE

Khalifa University
Master of Science in Electrical Engineering **Aug 2014-Dec 2016**

Ajman University **Ajman, UAE**
Bachelor of Science in Electrical Engineering **Sep 2009 -Sep 2013**

WORK EXPERIENCE

University of Sharjah **Sharjah, UAE**
Research Assistant **Mar 2022 - Present**

- Developed real-time test-bed of MMC based Microgrid using OPAL-RT (OP5700) control suit.
- Authored a comprehensive review paper on MMC-based microgrids, offering a solid foundation for future research and advancements in the field.
- Conducted research projects related to power electronics, sustainable energy, and grid-connected PV systems.
- Participated in training sessions and completed online courses to develop technical skills in machine learning, battery management systems, safety engineering, and power analysis applications.

Ajman University **Ajman, UAE**
Assistant instructor **Sep 2021 - Mar 2022**

- Conducted laboratory and tutorial sessions for undergraduate students in various subjects, developed lesson plans and provided individualized assistance to students as needed.
- Assisted students with their graduation projects by providing guidance, feedback, and support throughout the research and writing process.
- Collaborated with faculty and staff to develop and maintain course materials, graded student work, and participated in meetings to discuss curriculum and student progress.

Ajman University
Research Assistant **Oct 2017 – Dec 2020**

- Designed and implemented an innovative method for effectively integrating Photovoltaic (PV) strings to the grid using Modular Multilevel Converters (MMC) in renewable energy applications that led to improved grid stability and balanced three-phase currents.
- Conducted literature reviews and synthesized research findings to contribute to academic publications in refereed journals and conferences.
- Co-authored several papers in prestigious journals and conference papers, serving as the first author in each instance.
- Worked on research projects related to power electronics, sustainable energy, and grid-connected PV systems.

- Developed and tested algorithms for voltage balancing and speed control of motors using modular multilevel converters (MMC)
- Assisted in grant writing and project management, including tracking project timelines and milestones.

PROJECT EXPERIENCE

FourthBrain

Prediction of Remaining Useful Life (RUL) of Turbofan Engine

- Proposed a novel approach to predict RUL using a machine learning model that combines Convolutional Neural Networks (CNN) and Support Vector Regression (SVR) techniques.
- Gained experience in data preprocessing and cleaning, feature engineering, and model selection and tuning.
- Utilized Python as the primary programming language for the project and worked extensively with TensorFlow for neural network modeling.
- Built a web application using Streamlit and FastAPI for the front-end and back-end, respectively, which allowed for easy visualization and interaction with the predictive models.
- Deployed the web application on an EC2 instance using Docker, making it accessible to users on the internet.
- Developed a strong understanding of machine learning principles and their application to real-world problems.

Data Science Infinity

Assessing Campaign Performance Using Chi-Square Test for Independence

- Assessed campaign performance for a grocery retailer's new "Delivery Club" initiative, utilizing the Chi-Square Test for Independence to compare signup rates between customers who received a low-cost mailer and those who received a high-cost mailer. which will allow them to make more informed decisions in the future, with the overall aim of optimizing campaign ROI.

Data Science Infinity

Predicting Customer Loyalty Scores for a Grocery Retailer

- Developed a predictive model to estimate loyalty scores for untagged customers in the grocery retailer's database, allowing for a more accurate understanding of true customer loyalty and enabling better customer tracking, targeting, and communications.
- Compiled necessary data from the database, gathering key customer metrics to predict loyalty scores and separating customers based on the presence of the dependent variable.
- Tested three regression modeling approaches: Linear Regression, Decision Tree, and Random Forest to predict the loyalty score metric for those customers without it.
- Achieved the highest predictive accuracy with Random Forest (Adjusted R-Squared on Test Set: 0.955; R-Squared with K-Fold Cross Validation, k=4: 0.925), selecting it as the model for making predictions on the customers missing the loyalty score metric.

HONOR AWARDS

- Received a full graduate scholarship from Khalifa University to pursue Master of Science in Electrical Engineering.
- Ranked fifth among 157 projects participating in the Innovator Competition 2014 for the project titled "Wind Turbine-Powered Water Pump."
- Received the Best Research Paper Award at the Ninth Student Scientific Conference for the paper titled "Sound Source Localization System."
- Won first prize in the Engineering Design Project Competition during the IEEE Open Day for the project titled "Wind Turbine-Powered Water Pump."

PUBLICATIONS

Journal Articles

[1] Safia. B. Bashir, H. A. Zidan, and Z. A. Memon, "Power balancing of grid connected PV system based on MMC under different irradiation conditions," *Int. J. Electr. Power Energy Syst.*, vol. 117, p. 105717, May 2020, doi: 10.1016/j.ijepes.2019.105717.

[2] Safia. B. Bashir and A. R. Beig, "An improved voltage balancing algorithm for grid connected MMC for medium voltage energy conversion," *Int. J. Electr. Power Energy Syst.*, vol. 95, pp. 550–560, Feb. 2018, doi: 10.1016/j.ijepes.2017.09.002.

[3] Safia. B. Bashir, H. A. R. A. Zidan, and Z. A. Memon, "A modified CPS-PWM for capacitor voltage reduction of MMC based variable speed drive," *Int. J. Power Electron. Drive Syst.*, vol. 13, no. 3, p. 1326, Sep. 2022, doi: 10.11591/ijpeds.v13.i3.pp1326-1339.

[4] H. A. Zidan and Safia. B. Bashir, "Sensor-less vector control of induction motor at low-speed operation using modular multilevel converter," *Aust. J. Electr. Electron. Eng.*, vol. 16, no. 3, pp. 127–135, Jul. 2019, doi: 10.1080/1448837X.2019.1626528.

[5] H. A. Zidan and Safia. B. Bashir, "A Novel Robust Speed Sensor-Less Control of DC Motor," *Int. Rev. Autom. Control*, vol. 12, no. 2, p. 82, Mar. 2019, doi: 10.15866/ireaco.v12i2.16326.

Conference Proceedings

[1] Safia. B. Bashir, H. A. Zidan, and Z. A. Memon, "A Modified CPS-PWM for Capacitor Voltage Ripples Reduction of Modular Multilevel Converter Based Variable Speed Drive," in 2020 IEEE 29th International Symposium on Industrial Electronics (ISIE), Jun. 2020, pp. 601–605. doi: 10.1109/ISIE45063.2020.9152591.

[2] Safia. B. Bashir and Z. A. Memon, "An Improved Voltage Balancing Method for Grid Connected PV System Based on MMC Under Different Irradiance Conditions," in 2018 IEEE 61st International Midwest Symposium on Circuits and Systems (MWSCAS), Aug. 2018, pp. 865–868. doi: 10.1109/MWSCAS.2018.8623947.

[3] Safia. B. Bashir, H. A. Zidan, and S. Valtchev, "An Improved Voltage Ripple Control Algorithm for Modular Multilevel Converter Based Variable Speed Drive," in 2018 IEEE 18th International Power Electronics and Motion Control Conference (PEMC), Aug. 2018, pp. 968–973. doi: 10.1109/EPEPEMC.2018.8522009.

[4] Safia. B. Bahir, A. R. Beig, and M. Poshtan, "An improved space vector PWM for grid connected MMC," in 2017 IEEE 6th International Conference on Renewable Energy Research and Applications (ICRERA), Nov. 2017, pp. 556–561. doi: 10.1109/ICRERA.2017.8191123.

[5] Safia. B. Bashir and A. R. Beig, "A novel SVPWM-based switching algorithm for MMC for high power applications," in 2016 IEEE 59th International Midwest Symposium on Circuits and Systems (MWSCAS), Oct. 2016, pp. 1–4. doi: 10.1109/MWSCAS.2016.7870123.

SKILLS & INTERESTS

Skills & Tools

Programming: MATLAB, Python (Base, Pandas, NumPy, Matplotlib, Scikit-Learn, TensorFlow), SQL

Machine Learning: Linear Regression, Logistic Regression, Decision Trees, Random Forest, KNN, k-means, PCA, Association Rule Learning, Causal Impact Analysis

Other: Statistics, Github, Data Visualization, MS Office, Jupyter Notebook, AWS, Research