ARAFAT IBNE IKRAM

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RESEARCH INTERESTS

My research interests lie at the intersection of sustainability and renewable energy, focusing on ensemble learning and metaheuristic approaches to optimize configurations and minimize carbon footprints using green energy.

EDUCATION

Bachelor of Science in Electrical and Electronics Engineering (EEE) October 2017 – August 2022
*International Islamic University Chittagong, Kumira, Bangladesh* CGPA: 3.37/4.00
Thesis: Techno-Economic Assessment of PSO Optimized Microgrid with Hydrogen Storage System. 📄

PUBLICATIONS

1. **A. I. Ikram**, M. Shafiullah, M. R. Islam, and M. K. Rocky, "Techno-economic assessment and environmental impact analysis of hybrid storage system integrated microgrid," *Arabian Journal for Science and Engineering*, vol. 49, no. 12, pp. 15917–15934, 2024 📄

2. **A. I. Ikram**, A. Ullah, D. Datta, A. Islam, and T. Ahmed, "Optimizing energy consumption in smart homes: Load scheduling approaches," *IET Power Electronics*, vol. 17, no. 16, pp. 2656–2668, 2024 📄

3. M. S. Hassan, **A. I. Ikram**, M. A. Siddique, and N. Mohammad, "Performance analysis of machine learning-based traditional and ensemble techniques for smart grid stability prediction," in *2024 6th International Conference on Electrical Engineering and Information & Communication Technology (ICEEICT)*, pp. 1020–1025, IEEE, 2024 📄

4. **A. I. Ikram**, M. S.-U. Islam, M. A. B. Zafar, M. K. Rocky, A. Rahman, *et al.*, "Techno-economic optimization of grid-integrated hybrid storage system using genetic algorithm (ga)," in *2023 1st International Conference on Innovations in High Speed Communication and Signal Processing (IHCSP)*, pp. 300–305, IEEE, 2023 📄 | 🏆 Received Best Paper Award

5. M. Raihan, S. Himu, K. M. Abdullah, M. S. Parves, T. Tabassum, K. Ashaduzzaman, and **A. I. Ikram**, "A highly efficient wide-angle symmetric meta-absorber in visible to near-infrared," in *2024 International Conference on Advances in Computing, Communication, Electrical, and Smart Systems (iCACCESS)*, pp. 1–5, IEEE, 2024 📄

6. **A. I. Ikram**, M. S. Hassan, and N. Akter, "Electrical power quality disturbances detection in transmission lines using machine learning-enabled classifier," in *2024 International Conference on Advances in Computing, Communication, Electrical, and Smart Systems (iCACCESS)*, pp. 1–6, IEEE, 2024 📄

7. M. Rahman, S. E. A. Himu, A. A. S. Chowdhury, **A. I. Ikram**, S. H. Kashfi, M. I. Uddin, and M. Faisal, "Revolutionizing consumer power management: Unveiling power grid feasibility analysis using machine learning," in *2023 10th IEEE International Conference on Power Systems (ICPS)*, pp. 1–6, IEEE, 2023 📄

8. M. R. Pranta, M. S. Alam, S. E. A. Himu, M. M. Uddin, M. Zakaria, M. S. Parves, J. A. Fahim, and **A. I. Ikram**, "Small scale pv integration in bangladesh: Opportunities, challenges, and recommendation," in *2023 10th IEEE International Conference on Power Systems (ICPS)*, pp. 1–6, IEEE, 2023 📄

9. **A. I. Ikram**, S. E. A. Himu, T. Khandaker, M. A. R. Reyad, A. W. Erfan, M. M. Alam, and M. S. Islam, "Design optimization and assessment of floating solar pv with wind turbine systems at kepz," in *2023 5th International Conference on Sustainable Technologies for Industry 5.0 (STI)*, pp. 1–6, IEEE, 2023 📄

10. S. H. Kashfi, M. A. Al Noman, **A. I. Ikram**, S. E. A. Himu, F. Abrar, M. Rahman, and M. I. Uddin, "Feasibility study and performance analysis of rooftop solar panels and airdolphin wind turbines," in *2023 5th International Conference on Sustainable Technologies for Industry 5.0 (STI)*, pp. 1–6, IEEE, 2023 📄

11. M. A. R. Reyad, **A. I. Ikram**, M. M. Karim, S. E. A. Himu, and M. H. Shiam, "Design and performance analysis of grid-connected hybrid renewable systems," in *2023 IEEE 9th International Women in Engineering (WIE) Conference on Electrical and Computer Engineering (WIECON-ECE)*, pp. 444–449, IEEE, 2023 📄

12. **A. I. Ikram**, S. E. A. Himu, R. A. Tahsin, M. M. Hoque, M. M. Alam, A. W. Erfan, and N. Farzana, "A grid-connected anfis-mppt based solar pv system and hybrid energy storage," in *2023 IEEE 9th International Women in Engineering (WIE) Conference on Electrical and Computer Engineering (WIECON-ECE)*, pp. 30–35, IEEE, 2023 📄

13. I. Alam, **A. I. Ikram**, S. E. A. Himu, T. Khandaker, F. Abrar, and N. Farzana, "A cutting-edge implementation of iot-based monitoring for floating solar cells with dual-axis tracker," in *2023 IEEE 9th International Women in Engineering (WIE) Conference on Electrical and Computer Engineering (WIECON-ECE)*, pp. 177–182, IEEE, 2023 📄

14. N. Farzana, R. Kainat, I. Alam, **A. I. Ikram**, J. Abedin, and M. Shamim, "Cognizance of electric vehicle charging's impacts on distribution transformers," in *2023 IEEE 9th International Women in Engineering (WIE) Conference on Electrical and Computer Engineering (WIECON-ECE)*, pp. 1–6, IEEE, 2023 📄

15. S. E. A. Himu, **A. I. Ikram**, K. M. Abdullah, T. F. Choity, M. S. Parves, and M. R. Hasan, "A machine learning based social network data mining system for better search engine algorithm," in *2023 IEEE 9th International Women in Engineering (WIE) Conference on Electrical and Computer Engineering (WIECON-ECE)*, pp. 132–136, IEEE, 2023 📄

16. M. S. Siddequy, S. E. A. Himu, **A. I. Ikram**, F. Abrar, and S. S. Iqbal, "Performance study of different types of battery of electric vehicles using matlab simulink," in *2023 IEEE 9th International Women in Engineering (WIE) Conference on Electrical and Computer Engineering (WIECON-ECE)*, pp. 125–131, IEEE, 2023 📄

17. M. S.-U. Islam, M. A. B. Zafar, **A. I. Ikram**, M. S. R. Sachha, S. Ullah, and R. Ahamed, "Optimal cost and component configuration analysis of micro-grid using sso algorithm," in *2023 1st International Conference on Innovations in High Speed Communication and Signal Processing (IHCSP)*, pp. 306–311, IEEE, 2023 📄

18. M. S.-U. Islam, M. A. B. Zafar, **A. I. Ikram**, T. A. Chowdhury, M. S. R. Sachha, and S. Hossain, "Optimal cost and component configuration analysis of micro-grid using gwo algorithm," in *2023 International Conference on Electrical, Computer and Communication Engineering (ECCE)*, pp. 1–6, IEEE, 2023 📄

19. M. A. B. Zafar, M. R. Islam, M. S.-U. Islam, M. Shafiullah, and **A. I. Ikram**, "Economic analysis and optimal design of micro-grid using pso algorithm," in *2022 12th International Conference on Electrical and Computer Engineering (ICECE)*, pp. 421–424, IEEE, 2022 📄

20. S. E. A. Himu, S. Sultana, M. S. H. Chowdhury, **A. I. Ikram**, H. R. Saium, and M. M. Hossain, "Modification of dynamic logic circuit design technique for minimizing leakage current and propagation delay," in *2022 4th International Conference on Sustainable Technologies for Industry 4.0 (STI)*, pp. 1–5, IEEE, 2022 📄

EXPERIENCE

Data Analyst (Associate)   **November 2023 – February 2025**

Catalyst Solutions (a sister concern of ADIVA), Chittagong

*Led a **team of 5** in conducting statistical analysis on brands' awareness, perception, and health tracking data, including:*

- Processed large datasets by cleaning and removing outliers to ensure data quality.
- Designed Power BI dashboards to visualize key metrics and trends.
- Reviewed and validated survey questionnaires and program logic.
- Extracted features from the data and performed statistical comparisons.

TEACHING & ASSISTANTSHIPS

Teaching Assistant at Faculty of Science & Engineering   **January 2023 – November 2023**

International Islamic University Chittagong, Kumira, Bangladesh

Assisted university faculty in guiding **20+ undergraduate students** for the following tutorial sessions:

- Bridge-inverter modeling and controlling.
- Designing MPPT-based solar power systems in steady-state conditions.
- Assessing CAPEX and LCOE for projected models.

Research Assistant of Dr. Md. Shafiullah   **November 2022 – December 2023**

King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia

*Conducted research on waste-to-energy generation systems integrated with renewable energy sources, focusing on annual cost, risk factors, economic life cycle assessment, and environmental impact analysis, resulting in **8% cost reduction.***

Training

Industrial Trainee on Distributed Transformer Design & Manufacturing **January 2022 – February 2022**

General Electric Manufacturing Company Limited, Patenga

Gained practical knowledge in the manufacturing, planning, design, and maintenance of transformers, including:

- Specifying core and winding sizes based on voltage and load requirements.
- Ensuring proper insulation for thermal and electrical stability.
- Conducting Megger tests to measure insulation resistance and identify faults.

Skills

Programming: Python, MATLAB, Bash, and SQL.
Engineering: Octave, Microwind, Cadence, RETScreen, TRNSYS, AutoCAD (Electrical), and Proteus.
Developer Tools: Git, VS-Code, PyCharm, Google Colab, Jupyter Notebook, Arduino.
Libraries: NumPy, pandas, Matplotlib, SNS, TensorFlow, and SciKit.
Data Analytics: Data cleaning, large dataset handling, Excel (Pivot tables, Macros), R programming (Basic), Power BI.
Office Application: Google Suite & Microsoft Office, PIVOT, VBA Macros.
Writing & formatting: LaTeX, EndNote and Mendeley.
OS & Utilities: Linux CLI, file system navigation.

Achievements

Top-10 Best Student Paper Award at **IEEE-ICEEICT** **May 2024**

This study used both machine learning and ensemble learning techniques to determine the optimal approach to the stability of the smart grid.

Best Paper Award of the Session at **IEEE-IHCSP** **March 2023**

This study used the metaheuristic optimization technique to reduce up to 25% annual greenhouse gas emissions by varying penetration rates.

Placed 2nd on microcontroller-based Project Showcase at **IIUC** **August 2018**

Project focused on smart farming (real-time humidity control and pumping water on demand) for improving agricultural management.

Certifications

- SourceCAD logo AutoCAD Electrical Essentials Course.
- Microsoft Security Essentials Professional Certificate.
- Career Essentials in Data Analysis by Microsoft.
- Artificial Neural Networks (ANN) with Keras in Python and R.
- SQL for Data Science by Coursera-UCDavis.
- MATLAB Programming for Engineers and Scientists Specialization.
- Python Programming: Machine Learning, Deep Learning.

Linguistic Proficiency

English: Proficient
Bengali: Native.

Volunteering

Senior Executive at Embedded & Robotics Group IIUC **January 2021 – December 2021**

*Collaborated with a team to conduct a training program attended by **10+ students** covering topics such as:*

- A tutorial session on basic Arduino and Python programming.
- A webinar on Arduino controllers, Raspberry Pi, and IoT-based projects.
- A workshop on microcontroller-based line follower robots, including sensor interfacing and applications.