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Current Positions

Research Professor, PV Energy Storage Lab, Faculty of Artificial Intelligence & Engineering (FAIE), Multimedia University (MMU) Cyberjaya, MY

Project Tittle: AI-Driven Energy Management, Demand Response, and Second-Life Battery Integration for Smart EV Charging and Renewable Micro-grids. Aug 2023– Present

- Developed AI-based frameworks for smart EV charging systems integrated with solar PV, wind, and battery energy storage systems (BESS) in high-density residential environments.
- Engineered secure, AI-driven load management systems across multi-station EV charging networks, focusing on cyber resilience and real-time energy optimization.
- Designed and tested energy recycling systems for industrial applications by capturing rotational kinetic energy for enhanced energy efficiency.
- Recognized and addressed challenges in utilizing second-life EV batteries in micro-grids with integrated renewable energy sources.
- Designed, integrated, and characterized battery packs composed of diverse second-life battery cells/modules for micro-grid applications.
- Conducted demand response and power system stability analysis under rapid EV charging load conditions and during disruptive grid events.
- Performed comparative studies between new and second-life EV batteries, emphasizing performance, stability, and resilience during dynamic load conditions.
- Tested lab-scale micro-grid setups with integrated second-life batteries to assess energy storage feasibility and performance.
- Investigated the role of emerging technologies in establishing sustainable EV battery value chains.

- Participated in academic activities including journal clubs, case conferences, teaching, institutional meetings, and scholarly programs.

Education

Multimedia University (MMU), Faculty of Engineering — Cyberjaya, MY

PhD in Engineering, System Identification. — Jan 2018– Jan 2022

Degree: By Research

Jagannath University, Department of Computer Science and Engineering — Dhaka, BD

MSc in Computer Science and Engineering. — Jan 2016– Dec 2017

CGPA: 3.31 **(out of 4)**

Bangladesh University, Department of Business Administration — Dhaka, BD

MBA in Human Resource Management. — May 2014– Dec 2015

CGPA: 3.51 **(out of 4)**

Bangladesh University, Department of Electrical and Electronic Engineering — Dhaka, BD

BSc in Electrical and Electronic Engineering. — Jan 2009– Dec 2013

CGPA: 3.48 **(out of 4)**

Research and Teaching Experience

Casual Lecturer, Multimedia University (MMU), Faculty of Engineering — Cyberjaya, MY

Jan 2020– May 2022

- Conducted courses including Circuit Theory, Control Systems, Power Systems, Power System Protection, Introduction to Machines and Power Systems, and Multimedia Technology.
- Supervised electrical circuit, control, and machine laboratories.
- Provided academic and research support to over 90 students.
- Supervised final-year undergraduate student projects, guiding research and practical work..

Graduate Research Assistant, Multimedia University (MMU), Faculty of Engineering — Cyberjaya, MY

Jan 2018– April 2020

- Assisted in the development and execution of research projects, including data collection, analysis, and interpretation.
- Prepared reports, manuscripts, and presentations for scientific conferences and journal

publications.

- Supported grant application processes and preparation of funding documents.
- Assisted in designing research protocols, study frameworks, and questionnaires.
- Attended conferences and meetings to present research findings.
- Developed and maintained research databases, while monitoring relevant academic literature.
- Provided teaching support twice per month, generating materials, grading exams, and supervising final-year undergraduate projects.

Work Experience

Senior Engineer, Engineering Design and Documentation Department, Reverie Power & Automation Engineering Ltd.

Dhaka, BD,

June 2022– July 2023

- Lead the design and analysis of LV electrical distribution systems, including single-line diagrams, distribution boards, and protective devices.
- Conduct load flow, short-circuit, and coordination studies to ensure safe and reliable LV system performance.
- Ensure compliance with international and local standards (IEC, NEC, IEEE) and approve vendor documentation for LV equipment.
- Supervise and mentor junior engineers, guiding LV design practices and quality assurance.
- Coordinate with multidisciplinary teams to integrate LV systems into overall project design.
- Support construction, commissioning, and troubleshooting of LV systems on-site.
- Prepare technical reports, documentation, and design specifications; contribute to continuous improvement and value engineering initiatives.

Technology Specialist, Samsung SDS (South Korea)

Dhaka, BD,

Jan 2016– Dec 2017

- Supervised a 15-member technical team, coordinating tasks and ensuring project milestones were met.
- Analyzed and optimized the company's project management processes, achieving 50%-time savings and reducing total project costs by 20%.
- Managed the complete electrical design process, from conceptual design to execution.
- Prepared high-quality technical drawings and specifications for client approval and implementation.

- Oversaw installation, testing, and commissioning of substations and diesel generators, including generator synchronization.

Technology Specialist, Computer Source Ltd Dhaka, BD,

July 2013– Dec 2015

- Led project teams, assigning and monitoring tasks for engineers to ensure timely completion.
- Managed procurement and inventory of electrical equipment for installation and maintenance.
- Researched emerging technologies and competitor systems to drive innovation and improvements.
- Oversaw network infrastructure, online UPS systems, and all electrical power installations.

Publications

Journals:

- **Sarker, M. T.,** Hossen, M. S., Ramasamy, G., Al Qwaid, M., Karim, H. A. (2026). SLB-Based Energy Storage for Solar-Integrated Charging Stations in Tropical Regions, *Scientific Reports,* Accepted for Publication.
- **Sarker, M. T.,** Sadeque, M.G, Al Qwaid, M., Siddiquee, K.N.A, Karim, H. A. (2026). Modeling and Performance Evaluation of Hybrid SLB-PV Systems for Sustainable Telecom Tower Power Supply in Bangladesh, *Energy Report,* Accepted for Publication.
- **Sarker, M. T.,** Ramasamy, G., Al Qwaid, M., Hossen, M. S., & Sadeque, M. G. (2025). AI-driven smart grid optimization for hospital energy systems integrating renewable generation, predictive maintenance, and resilient infrastructure. *Scientific Reports*, *15*(1), 44787. https://doi.org/10.1038/s41598-025-28907-5
- **Sarker, M. T.,** Ramasamy, G., Al Qwaid, M., & Krishnan, S. (2025). Second-Life EV Batteries for PV–SLB Hybrid Petrol Stations: A Roadmap for Malaysia's Urban Energy Transition. *Urban Science*, *9*(10), 422. https://doi.org/10.3390/urbansci9100422
- Abuajwa, O., Thiagarajah, S. P., Ambak, Z., **Sarker, M. T.,** Ramasamy, G., & David, A. P. (2025). Comprehensive review of wireless power transfer systems for electric vehicle charging applications. *Discover Applied Sciences*, *7*(10), 1-49. https://doi.org/10.1007/s42452-025-07738-z
- **Sarker, M. T.,** Al Qwaid, M., Ramasamy, G., & Haram, M. H. S. M. (2025). Performance Evaluation of Second-Life EV Batteries for Off-Grid Solar Energy Storage System. *IEEE Access*. https://doi.org/10.1109/ACCESS.2025.3596991
- **Sarker, M. T.,** Al Qwaid, M., Hossen, M. S., & Ramasamy, G. (2025). Performance Optimization of

Grounding System for Multi-Voltage Electrical Installation. *Applied Sciences (2076-3417)*, *15*(15). **https://doi.org/10.3390/app15158600**

- Hossen, M. S., **Sarker, M. T.,** Nabi, M. S., Bannah, H., Ramasamy, G., & Eng Eng, N. (2025). Federated AI-OCPP Framework for Secure and Scalable EV Charging in Smart Cities. *Urban Science*, *9*(9), 363. **https://doi.org/10.3390/urbansci9090363**
- **Sarker, M. T.,** Al Qwaid, M., Shern, S. J., & Ramasamy, G. (2025). AI-Driven Optimization Framework for Smart EV Charging Systems Integrated with Solar PV and BESS in High-Density Residential Environments. *World Electric Vehicle Journal*, *16*(7), 385. https://doi.org/10.3390/wevj16070385
- Hossen, M. S., **Sarker, M. T.,** Al Qwaid, M., Ramasamy, G., & Eng Eng, N. (2025). AI-Driven Framework for Secure and Efficient Load Management in Multi-Station EV Charging Networks. *World Electric Vehicle Journal*, *16*(7), 370. https://doi.org/10.3390/wevj16070370
- **Sarker, M. T.,** Jing, S. W., Ramasamy, G., Thiagarajah, S. P., & Sadeque, M. G. (2025). Energy Recycling System for Harnessing Industrial Rotational Kinetic Energy. *Energy Engineering*, *122*(7). https://doi.org/10.32604/ee.2025.065331
- Jing, S. W., **Sarker, M. T.,** Ramasamy, G., Thiagarajah, S. P., & Aman, F. (2025). Industrial Untapped Rotational Kinetic Energy Assessment for Sustainable Energy Recycling. *Energy Engineering*, *122*(3). https://doi.org/10.32604/ee.2025.058916
- Shern, S. J., **Sarker, M. T.,** Haram, M. H. S. M., Ramasamy, G., Thiagarajah, S. P., & Al Farid, F. (2024). Artificial Intelligence Optimization for User Prediction and Efficient Energy Distribution in Electric Vehicle Smart Charging Systems. *Energies*, *17*(22), 5772. https://doi.org/10.3390/en17225772
- Shern, S. J., **Sarker, M. T.,** Ramasamy, G., Thiagarajah, S. P., Al Farid, F., & Suganthi, S. T. (2024). Artificial Intelligence-Based Electric Vehicle Smart Charging System in Malaysia. *World Electric Vehicle Journal*, 15(10), 440. https://doi.org/10.3390/wevj15100440
- **Sarker, M. T.,** Haram, M. H. S. M., Shern, S. J., Ramasamy, G., & Al Farid, F. (2024). Readiness of Malaysian PV System to Utilize Energy Storage System with Second-Life Electric Vehicle Batteries. *Energies*, *17*(16), 3953. https://doi.org/10.3390/en17163953
- **Sarker, M. T.,** Haram, M. H. S. M., Shern, S. J., Ramasamy, G., & Al Farid, F. (2024). Second-Life Electric Vehicle Batteries for Home Photovoltaic Systems: Transforming Energy Storage and Sustainability. *Energies*, *17*(10), 2345. https://doi.org/10.3390/en17102345
- **Sarker, M. T.,** Al Farid, F., Alam, M. J., Ramasamy, G., Karim, H. A., Mansor, S., & Sadeque, M. G. (2024). Analysis of the power sector in Bangladesh: current trends, challenges, and future perspectives. *Bulletin of Electrical Engineering and Informatics*, *13*(6), 3862-3879. https://doi.org/10.11591/eei.v13i6.7503
- **Sarker, M. T.,** Ramasamy, G., Al Farid, F., Mansor, S., & Karim, H. A. (2024). Energy consumption forecasting: a case study on Bhashan Char island in Bangladesh. *Bulletin of Electrical Engineering and Informatics*, *13*(5), 3021-3032. https://doi.org/10.11591/eei.v13i5.7561

- **Sarker, M. T.,** Alam, M. J., Ramasamy, G., & Uddin, M. N. (2024). Energy demand forecasting of remote areas using linear regression and inverse matrix analysis. *International Journal of Electrical & Computer Engineering, 14(1), (129-139),* **DOI:** http://doi.org/10.11591/ijece.v14i1.pp129-139
- **Sarker, M. T.,** Haram, M. H. S. M., Ramasamy, G., Farid, F. A., & Mansor, S. (2023). Solar Photovoltaic Home Systems in Malaysia: A Comprehensive Review and Analysis. *Energies*, *16*(23), 1-23. **DOI:** https://doi.org/10.3390/en16237718
- Haram, M. H. S. M., **Sarker, M. T.,** Ramasamy, G., & Ngu, E. E. (2023). Second Life EV Batteries: Technical Evaluation, Design Framework, and Case Analysis. *IEEE Access, 11, (*138799 – 138812). **DOI:** 10.1109/ACCESS.2023.3340044
- **Sarker, M. T.,** & Ramasamy, G. (2023). Optimal Signal Design in System Identification for Model Predictive Control (MPC). *IEEE Access, 11, (140229 - 140237). **DOI:** 10.1109/ACCESS.2023.3342024*
- **Sarker, M. T.,** Tan, A. H., & Yap, T. T. V. (2023). Design of Software-Based Optimal Signals for System Identification. *IEEE Transactions on Instrumentation and Measurement, 72, (3001810)*. **DOI:** 10.1109/TIM.2023.3290297
- **Sarker, M. T.,** Tan, A. H., & Yap, T. T. V. (2023). Input Spectrum Design for Identification of a Thermostat System. *IEEE Access*, *11*, (2920-2927). **DOI:** 10.1109/ACCESS.2023.3234255
- Cham, C. L., Tan, A. H., Tan, W. H., & **Sarker, M. T.** (2020). Model predictive control with direct feedthrough with application on a MIST reactor. *IFAC-PapersOnLine*, *53*(1), 183-188. DOI: https://doi.org/10.1016/j.ifacol.2020.06.031

Journals (Under Review):

- **Sarker, M. T.,** Shawon, S. M., Hossen, M. S., Ramasamy, G., Al Qwaid, M. (2026). Explainable Hybrid CNN–BiLSTM–XGBoost Model for Daily EV Charging Load and User-Demand Forecasting in Smart Charging Networks, *IEEE Transactions on Transportation Electrification*, Under Review.
- **Sarker, M. T.,** Shawon, S. M., Hossen, M. S., Haider, S.N., Barua, A., Ramasamy, G., Al Qwaid, M. (2026). Data-Driven Forecasting of Electric Vehicle Charging Demand and User Activity for Smart Grid Operation Using Hybrid Deep Learning Models, *IEEE Transactions on Smart Grid.*, Under Review.
- **Sarker, M. T.,** Hossen, M. S., Ramasamy, G., Al Qwaid, M. (2026). Second-Life Electric Vehicle Lithium-Ion Batteries for Stationary Energy Storage: Degradation Mechanisms, Health Diagnostics, Techno-Economic Performance, and Sustainability, *Renewable and Sustainable Energy Reviews,* Under Review.
- **Sarker, M. T.,** Hossen, M. S., Ramasamy, G., Al Qwaid, M. (2026). Model-Based and Data-Driven Estimation of State of Charge, State of Health, and Remaining Useful Life for Lithium-Ion Batteries in Electric Vehicles: A Comprehensive Review, *Journal of Energy Storage,* Under Review.
- **Sarker, M. T.,** Hossen, M. S., Ramasamy, G., Al Qwaid, M. (2026). Toward Standardized Diagnostic

Procedures for Performance and Safety Qualification of Second-Life Electric Vehicle Batteries, *Results in Engineering*, Under Review.

- **Sarker, M. T.,** Hossen, M. S., Ramasamy, G., Al Qwaid, M. (2026). Electric Vehicle Charging Management and Security in Multi-Charging Station Environments: A Comprehensive Review, *Journal of Engineering Research*, Under Review.

Conferences:

- Hossen, M. S., **Sarker, M. T.,** Ramasamy, G., Eng, N. E., Al Farid, F., & Sadeque, M. G. (2025). Integration of AI-driven systems with open charge point protocol (OCPP) for enhanced electric vehicle charging management. *2025 Multimedia University Engineering Conference (MECON)*, 1–6. IEEE. https://doi.org/10.1109/MECON67253.2025.11277062
- **Sarker, M. T.,** Mansor, S., Al Farid, F., Karim, H. A., & Ramasamy, G. (2023, December). Investigation of Optimal Perturbation Signals for Multivariable System under Model Predictive Control. In *2023 IEEE 11th Conference on Systems, Process & Control (ICSPC)* (pp. 304-309). IEEE. **DOI:** 10.1109/ICSPC59664.2023.10420073
- **Sarker, M. T.,** Al Farid, F., Ramasamy, G., Mansor, S., & Karim, H. A. (2023, December). An Overview of System Identification Procedures and Perturbation Signal. In *2023 IEEE 11th Conference on Systems, Process & Control (ICSPC)* (pp. 282-287). IEEE. **DOI:** 10.1109/ICSPC59664.2023.10420174
- **Sarker, M. T.,** Tan, A. H., & Yap, T. T. V. (2022, June). Performance evaluation of iterative signal design for system identification. In *2022 IEEE International Conference on Automatic Control and Intelligent Systems (I2CACIS)* (pp. 203-208). IEEE. **DOI:** 10.1109/I2CACIS54679.2022.9815488
- **Sarker, M. T.,** Tan, A. H., & Yap, T. T. V. (2022, June). Amplitude spectrum design for multivariable system identification in open loop. In *2022 IEEE International Conference on Automatic Control and Intelligent Systems (I2CACIS)* (pp. 107-112). IEEE. **DOI:** 10.1109/I2CACIS54679.2022.9815487

Awards, Certifications, Reviewer

Awards:

- Research Fellowship Award, Multimedia University, Malaysia (2018)
- Research Fellowship Award, ICT Division, Bangladesh (2019)
- Travel Grant Sponsorship, Bangladesh-Sweden Travel Trust Fund (2020)
- iNVENTX Invention Exhibition: Gold Medal (2023)
- iNVENTX Invention Exhibition: 3 Gold Medals (2024)
- iNVENTX Invention Exhibition: 2 Silver Medals (2025)

Certifications:

- Supervisor Competency Certificate, Electricity Licensing Board (ELB), Bangladesh.
- Inclusive Teaching Certificate, Multimedia University, Malaysia.

Reviewer:

- IEEE Access, ISSN: 2169-3536.
- IEEE Transactions on Network Science and Engineering, ISSN: 2327-4697.
- ISA Transactions, ISSN: 0019-0578.
- Energy Reports, ISSN: 2352-4847
- PeerJ Computer Science ISSN: 2167-9843.
- Transactions on Emerging Telecommunications Technologies, ISSN:2161-3915.
- MECON - DIFCON - Multimedia University Conference (2023 to till now).

Extracurricular Activities

- IEEE Organized student workshops and seminars on emerging technologies and innovation.
- Mentored undergraduate and postgraduate students in research competitions and project exhibitions.
- Active member of university IEEE student branch, participating in technical events and community outreach.
- Volunteered in STEM awareness programs for local schools and community centers.
- Coordinated inter-university technical competitions and hackathons.

Training & Facilitation

- Pedagogy & Teaching, Multimedia University (MMU), Malaysia – April 2018
- Hands-on Training in Thesis & Research Paper Writing, MMU, Malaysia – Dec 2019
- TURNITIN & Plagiarism Workshop, MMU, Malaysia – Nov 2020
- MATLAB Workshop, MMU, Malaysia – Nov 2021
- Solar Home PV System with Second-life EV Batteries, MMU, Malaysia – Dec 2024
- Energy Manager Training Course (Renewable & Energy Systems), Malaysian Green Technology & Climate Change Corporation – July 2025
- Technical Training: Solar PV System Design & Operations, Malaysian Green Technology & Climate Change Corporation – April 2025
- Electrical for Non-Electrical Personnel course (Basic Electrical Engineering), OTC Training Centre, Kuala Lumpur – July 2025
- Workshop on Innovations in Solar Energy, Virtual – May 2025

References

Prof. Ir. Dr. Tan Ai Hui

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Malaysia

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