Resume

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Research area:

- Renewable energy, especially, wind energy conversion system
- Microgrids and power system frequency control
- Model predictive control theory and applications
- Fractional-order PID controller and process control.

Education background：

- 2017/09-2022/08, North China Electric Power University, Ph.D. degree, adviser: Prof. Xiangjie Liu, Major in Control Theory and Control Engineering.
- 2013/09-2016/11， Faculty of Engineering, Cairo University, Master, adviser: Prof. Hassan M. Emara and Dr. Mohamed I. El-Hawwary, Major in Electrical Power and Machines Engineering.
- 2004/09-2008/06, Faculty of Engineering, Cairo University, Bachelor, Major in Electrical Power and Machines Engineering.

Work experience:

- 2023/06-Now, Cairo University, Faculty of Engineering, Department of Electrical Power and Machines Engineering, Assistant Professor.
- 2016/12-2023/06, Cairo University, Faculty of Engineering, Department of Electrical Power and Machines Engineering, associate Lecturer.
- 2014/01-2016/12, Cairo University, Faculty of Engineering, Department of Electrical Power and Machines Engineering, Teaching Assistant.
- 2014/01-2015/3, Egyptian Armed Forced (Construction Branch), Construction of Hurghada Touristic Port (Electrical Site Engineer – Technical office).
- 2015/12-2017/9, ConTech (system integrator of Schneider Electric Egypt), automated systems based on PLC and SCADA systems (Electrical Site

Engineer – Technical office).

Publication list:

Journal papers:

[1] **M. A. Abdelbaky**, X. Liu* and D. Jiang, "Design and implementation of partial offline fuzzy model-predictive pitch controller for large-scale wind-turbines," Renewable Energy, vol. 145, pp. 981-996, 2020. DOI: https://doi.org/10.1016/j.renene.2019.05.074.

[2] X. Kong, **M. A. Abdelbaky***, X. Liu and K. Y. Lee, "Stable feedback linearization-based economic MPC scheme for thermal power plant," Energy, vol. 268, p. 126658, 2023. DOI: https://doi.org/10.1016/j.energy.2023.126658.

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[5] X. Kong, L. Ma, C. Wang, S. Guo, **M. A. Abdelbaky**, X. Liu and K. Y. Lee, "Large-scale wind farm control using distributed economic model predictive scheme," Renewable Energy, vol. 181, pp. 581-591, 2022. DOI: 10.1016/j.renene.2021.09.048.

[6] H. Ur Rehman*, X. Yan, **M. A. Abdelbaky***, M. Ullah Jan and S. Iqbal, "An advanced virtual synchronous generator control technique for frequency regulation of grid-connected PV system," International Journal of Electrical Power & Energy Systems, vol. 125, p. 106440, 2021. DOI: https://doi.org/10.1016/j.ijepes.2020.106440.

[7] M. U. Jan, A. Xin, H. U. Rehman, **M. A. Abdelbaky***, S. Iqbal and M. Aurangzeb, "Frequency Regulation of an Isolated Microgrid With Electric Vehicles and Energy Storage System Integration Using Adaptive and Model Predictive Controllers," IEEE Access, vol. 9, pp. 14958-14970, 2021. DOI: 10.1109/ACCESS.2021.3052797.

[8] M. U. Jan*, A. Xin, **M. A. Abdelbaky***, H. U. Rehman and S. Iqbal, "Adaptive and Fuzzy PI Controllers Design for Frequency Regulation of Isolated Microgrid Integrated With Electric Vehicles," IEEE Access, vol. 8, pp. 87621-87632, 2020. DOI: 10.1109/ACCESS.2020.2993178.

[9] S. Iqbal*, A. Xin, M. U. Jan, **M. A. Abdelbaky***, H. U. Rehman, S. Salman, S. A. A. Rizvi and M. Aurangzeb, "Aggregation of EVs for Primary Frequency Control of an Industrial Microgrid by Implementing Grid Regulation & Charger Controller," IEEE Access, vol. 8, pp. 141977-141989, 2020. DOI: 10.1109/ACCESS.2020.3013762.

[10] H. Zhu, S. A. Z. Ahmed*, M. A. Alfakih, **M. A. Abdelbaky**, A. R. Sayed and M. A. A. Saif, "Photovoltaic Failure Diagnosis Using Sequential Probabilistic

Neural Network Model," IEEE Access, vol. 8, pp. 220507-220522, 2020. DOI: 10.1109/ACCESS.2020.3043129.

[11] S. Iqbal*, A. Xin, M. U. Jan, **M. A. Abdelbaky**, H. U. Rehman, S. Salman, M. Aurangzeb, S. A. Rizvi and N. A. Shah, "Improvement of Power Converters Performance by an Efficient Use of Dead Time Compensation Technique," Applied Sciences, vol. 10, 2020. DOI: https://doi.org/10.3390/app10093121.

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[13] A. Khan, S. Geng*, X. Zhao, Z. Shah, M. U. Jan and **M. A. Abdelbaky***, "Design of MIMO Antenna with an Enhanced Isolation Technique," Electronics, vol. 9, p. 1217, 2020. DOI: https://doi.org/10.3390/electronics9081217.

[14] S. Iqbal*, A. Xin, M. U. Jan, S. Salman, A. u. M. Zaki, H. U. Rehman, M. F. Shinwari and M. A. Abdelbaky, "V2G Strategy for Primary Frequency Control of an Industrial Microgrid Considering the Charging Station Operator," Electronics, vol. 9, p. 549, 2020. DOI: https://doi.org/10.3390/electronics9040549.

Conference papers:

[15] **M. A. Abdelbaky**, X. Liu and X. Kong, "Stable Economic Model-Predictive Control for T-S Fuzzy Systems with Persistent Disturbances," in 2021 40th Chinese Control Conference (CCC), 2021, pp. 2703-2710. DOI: 10.23919/CCC52363.2021.9549729

[16] **M. A. Abdelbaky**, H. M. Emara, M. I. El-Hawwary, A. Bahgat and X. Liu, "Implementation of Fractional-order PID Controller Using Industrial DCS with Experimental Validation," in 2020 IEEE 4th Conference on Energy Internet and Energy System Integration (EI2), 2020, pp. 4407-4413. DOI: 10.1109/EI250167.2020.9347159.

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[18] **M. A. Abdelbaky**, M. I. El-Hawwary and H. M. Emara, "Implementation of fractional-order PID controller in an industrial distributed control system," in 2017 14th International Multi-Conference on Systems, Signals & Devices (SSD), 2017, pp. 713-718. DOI: 10.1109/SSD.2017.8167004.

[19] A. R. Sayed, C. Wang, T. Bi, **M. A. Abdelbaky** and A. Masood, "Optimal Power-Gas Flow of Integrated Electricity and Natural Gas System: A Sequential MISOCP Approach," in 2019 IEEE 3rd Conference on Energy Internet and Energy System Integration (EI2), 2019, pp. 283-288, DOI: 10.1109/EI247390.2019.9062250. (**EI2 2019 Conference Best Paper Award**)

[20] H. U. Rehman, X. Yan, **M. A. Abdelbaky**, M. U. Jan, A. R. Sayed, S. A. Zaki and S. Iqbal, "Frequency Regulation and optimization of Microgrid System with Multi PV-VSG using Advanced Droop Controller," in 2020 IEEE 4th

Conference on Energy Internet and Energy System Integration (EI2), 2020, pp. 1495-1500. DOI: 10.1109/EI250167.2020.9347308.

[21] S. A. Zaki, H. Zhu, J. Yao, A. R. Sayed and **M. A. Abdelbaky**, "Detection and Localization the Open and Short Circuit Faults in PV System: A MILP Approach," in 2020 Asia Energy and Electrical Engineering Symposium (AEEES), 2020, pp. 187-193, DOI: 10.1109/AEEES48850.2020.9121484.

[22] M. U. Jan, A. Xin, S. Iqbal, **M. A. Abdelbaky**, H. U. Rehman, T. Egamnazrova, M. Aurangzeb and S. Salman, "Frequency regulation of an isolated micro-grid integrated with electric vehicles using adaptive and fuzzy PI controllers," in The 16th IET International Conference on AC and DC Power Transmission (ACDC 2020), 2020, vol. 2020, pp. 2281-2286. DOI: 10.1049/icp.2020.0337.

[23] H. U. Rehman, X. Yan, **M. A. Abdelbaky**, M. U. Jan, S. Iqbal, A. Masood, T. Egamnazrova, and M. Aurangzeb, "Droop control design based on advanced particle swarm optimization for grid-connected multi PV-VSG," in The 16th IET International Conference on AC and DC Power Transmission (ACDC 2020), 2020, vol. 2020, pp. 2214-2220 DOI: 10.1049/icp.2020.0332.

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