Bibliography

- Bhim (Electrical engineer) Singh, Ambrish. Chandra, and Kamal. Al-Haddad. Power Quality : Problems and Mitigation Techniques. Wiley, 2014.
- M. P. Kazmierkowski. Power quality: Problems and mitigation techniques [book news]. IEEE Industrial Electronics Magazine, 9(2):62–62, June 2015.
- [3] Thomas Ackermann, Göran Andersson, and Lennart Söder. Distributed generation: A definition. *Electric Power Systems Research*, 57:195–204, 2001.
- [4] Ritwik Majumder. Modeling, stability analysis and control of microgrid. PhD thesis, Queensland University of Technology, 2010.
- [5] M. Badoni, B. Singh, and A. Singh. Implementation of echo-state network-based control for power quality improvement. *IEEE Transactions on Industrial Electronics*, 64(7):5576–5584, July 2017.
- [6] A. Javadi, L. Woodward, and K. Al-Haddad. Real-time implementation of a three-phase threaf based on a vsc and a p+r controller to improve the power quality of weak distribution systems. *IEEE Transactions on Power Electronics*, 33(3):2073–2082, March 2018.
- [7] H. Dong, S. Yuan, Z. Han, X. Ding, S. Ma, and X. Han. A comprehensive strategy for power quality improvement of multi-inverter-based microgrid with mixed loads. *IEEE Access*, 6:30903–30916, 2018.

- [8] N. L. Kusters and W. J. M. Moore. On the definition of reactive power under non-sinusoidal conditions. *IEEE Transactions on Power Apparatus and Systems*, PAS-99(5):1845–1854, Sept 1980.
- [9] H. Akagi, Y. Kanazawa, and A. Nabae. Instantaneous reactive power compensators comprising switching devices without energy storage components. *IEEE Transactions on Industry Applications*, IA-20(3):625–630, May 1984.
- [10] Hyosung Kim, F. Blaabjerg, B. Bak-Jensen, and Jaeho Choi. Instantaneous power compensation in three-phase systems by using p-q-r theory. In 2001 IEEE 32nd Annual Power Electronics Specialists Conference (IEEE Cat. No.01CH37230), volume 2, pages 478–485 vol.2, 2001.
- [11] Alfred Engler and Nikos Soultanis. Droop control in lv-grids. In Future Power Systems, 2005 International Conference on, pages 6–pp. IEEE, 2005.
- [12] Po-Tai Cheng, Chien-An Chen, Tzung-Lin Lee, and Shen-Yuan Kuo. A cooperative imbalance compensation method for distributed-generation interface converters. *IEEE Transactions on Industry Applications*, 45(2):805–815, 2009.
- [13] Davood Yazdani, Alireza Bakhshai, Geza Joos, and M Mojiri. A nonlinear adaptive synchronization techniquefor grid-connected distributed energy sources. *IEEE Transactions* on power electronics, 23(4):2181–2186, 2008.
- [14] Huang Wei, Zhang Jianhua, Xie Qinghua, and Wu Ziping. The impact on power quality by pwm converter in micro-grid. In Sustainable Energy Technologies, 2008. ICSET 2008. IEEE International Conference on, pages 239–243. IEEE, 2008.
- [15] TS Weerakoon, SA Kurera, and A Arulampalam. Voltage source converters to improve the operation of the micro-grid. In *Industrial and Information Systems, 2008. ICHS 2008. IEEE Region 10 and the Third international Conference on*, pages 1–6. IEEE, 2008.
- [16] Monika Ruh, Goran Andersson, Andreas Borer, HH Zeineldin, and JL Kirtley. Micro-grid operation of inverter based distributed generation with voltage and frequency dependent

loads. In Power & Energy Society General Meeting, 2009. PES'09. IEEE, pages 1–6. IEEE, 2009.

- [17] Yong Xue, Jiamei Deng, and Shuangbao Ma. Power flow control of a distributed generation unit in micro-grid. In *Power Electronics and Motion Control Conference*, 2009. IPEMC'09. IEEE 6th International, pages 2122–2125. IEEE, 2009.
- [18] Wen Liu and Ming Liu. The distributed control of autonomous microgrid based on voltage. In Power Electronics Systems and Applications, 2009. PESA 2009. 3rd International Conference on, pages 1–6. IEEE, 2009.
- [19] Xiaoxiao Yu and Ashwin M Khambadkone. Combined active and reactive power control of power converter building block to facilitate the connection of micro-grid to electric power system. In *Energy Conversion Congress and Exposition, 2009. ECCE 2009. IEEE*, pages 1444–1450. IEEE, 2009.
- [20] Tsunashi Kaneko, Shohei Shimizu, and Hiromitsu Ohmori. Power consumption/supply control using neural network for micro grids. In *ICCAS-SICE*, 2009, pages 1916–1921. IEEE, 2009.
- [21] Elisabetta Tedeschi, Paolo Tenti, Paolo Mattavelli, and Daniela Trombetti. Cooperative control of electronic power processors in micro-grids. In *Power Electronics Conference*, 2009. COBEP'09. Brazilian, pages 1–8. IEEE, 2009.
- [22] Ritwik Majumder, Farhad Shahnia, Arindam Ghosh, Gerard Ledwich, Michael Wishart, and Firuz Zare. Operation and control of a microgrid containing inertial and non-inertial micro sources. In *TENCON 2009-2009 IEEE Region 10 Conference*, pages 1–6. IEEE, 2009.
- [23] Chunsheng Wu, Hua Liao, Zilong Yang, Yibo Wang, and Honghua Xu. Voltage and frequency control of inverters connected in parallel forming a micro-grid. In *Power System Technology (POWERCON)*, 2010 International Conference on, pages 1–6. IEEE, 2010.
- [24] Edson Hirokazu Watanabe, M Aredes, JL Afonso, JG Pinto, LFC Monteiro, and Hirofumi Akagi. Instantaneous p-q power theory for control of compensators in micro-grids. In

Nonsinusoidal Currents and Compensation (ISNCC), 2010 International School on, pages 17–26. IEEE, 2010.

- [25] Zhichao Wu, Liming Liu, and Hui Li. Extensive real/reactive power flow control for a single-stage grid-connected inverter integrating with micro storage. In *Power Electronics Conference (IPEC), 2010 International*, pages 2703–2707. IEEE, 2010.
- [26] Mehdi Davodi, Reza Norouzizadeh, Moez Davodi, and Ehsan Reihani. Simulation and analysis of a micro grid with distributed generation units under unbalanced conditions. In Power and Energy Engineering Conference (APPEEC), 2010 Asia-Pacific, pages 1–4. IEEE, 2010.
- [27] Stefan Breban, Mircea M Radulescu, and Benoît Robyns. Direct active and reactive power control of variable-speed doubly-fed induction generator on micro-hydro energy conversion system. In *Electrical Machines (ICEM)*, 2010 XIX International Conference on, pages 1–6. IEEE, 2010.
- [28] A Nagliero, RA Mastromauro, VG Monopoli, M Liserre, and A Dell'Aquila. Analysis of a universal inverter working in grid-connected, stand-alone and micro-grid. In *Industrial Electronics (ISIE), 2010 IEEE International Symposium on*, pages 650–657. IEEE, 2010.
- [29] Soumya R Mohanty, Sumit Sen, Nand Kishor, Prakash K Ray, and Vijay P Singh. Harmonic compensation in distributed generation based micro-grid using droop control technique. In *Power Engineering and Optimization Conference (PEOCO), 2011 5th International*, pages 233–237. IEEE, 2011.
- [30] Zhou Xue-song, Cui Li-qiang, and Ma You-jie. Research on control of micro grid. In Measuring Technology and Mechatronics Automation (ICMTMA), 2011 Third International Conference on, volume 2, pages 1129–1132. IEEE, 2011.
- [31] S Dasgupta, SN Mohan, Sanjib Kumar Sahoo, and Sanjib Kumar Panda. A lyapunov function based current controller to control active and reactive power flow in a three phase grid connected pv inverter under generalized grid voltage conditions. In *Power Electronics*

and ECCE Asia (ICPE & ECCE), 2011 IEEE 8th International Conference on, pages 1110–1117. IEEE, 2011.

- [32] Hussam Alatrash, Adje Mensah, Evlyn Mark, Ghaith Haddad, and Johan Enslin. Generator emulation controls for photovoltaic inverters. *IEEE Transactions on Smart Grid*, 3(2):996– 1011, 2012.
- [33] S Dasgupta, SN Mohan, SK Sahoo, and SK Panda. Derivation of instantaneous current references for three phase pv inverter connected to grid with active and reactive power flow control. In *Power Electronics and ECCE Asia (ICPE & ECCE), 2011 IEEE 8th International Conference on*, pages 1228–1235. IEEE, 2011.
- [34] Bin Li, Xiaohe Tian, and Hongyan Zeng. A grid-connection control scheme of pv system with fluctuant reactive load. In *Electric Utility Deregulation and Restructuring and Power Technologies (DRPT)*, 2011 4th International Conference on, pages 786–790. IEEE, 2011.
- [35] Rasool Aghatehrani and Rajesh Kavasseri. Sliding mode control approach for voltage regulation in microgrids with dfig based wind generations. In *Power and Energy Society General Meeting*, 2011 IEEE, pages 1–8. IEEE, 2011.
- [36] Weisi Deng and Changhong Deng. Study on dynamic reactive compensation capacity of a microgrid with high permeability photovoltaic power. In *Electrical and Control Engineering* (ICECE), 2011 International Conference on, pages 5015–5018. IEEE, 2011.
- [37] MH Ashourian, AA Mohd Zin, AS Mokhtar, SJ Mirazimi, and Z Muda. Controlling and modeling power-electronic interface ders in islanding mode operation micro grid. In *Industrial Electronics and Applications (ISIEA), 2011 IEEE Symposium on*, pages 161–166. IEEE, 2011.
- [38] Vishal Vekhande and BG Fernandes. Bidirectional current-fed converter for integration of dc micro-grid with ac grid. In *India Conference (INDICON), 2011 Annual IEEE*, pages 1–5. IEEE, 2011.

- [39] Vishal Verma, Peeyush Pant, and Bhim Singh. Indirect current control of btb-vsc with cage-rotor induction generator operating in grid connected and isolated mode. In *Innovative* Smart Grid Technologies-India (ISGT India), 2011 IEEE PES, pages 294–300. IEEE, 2011.
- [40] Santiago Sanchez Acevedo and Marta Molinas. Evaluation of non-active current compensation in smart grids. In Innovative Smart Grid Technologies (ISGT Europe), 2012 3rd IEEE PES International Conference and Exhibition on, pages 1–8. IEEE, 2012.
- [41] Chia-Tse Lee, Chia-Chi Chu, and Po-Tai Cheng. A new droop control method for the autonomous operation of distributed energy resource interface converters. *IEEE Transactions* on Power Electronics, 28(4):1980–1993, 2013.
- [42] R. Divya, S. M. Nandukrishnan, and M. G. Nair. Hardware implementation of power sharing and power quality improvement for grid integration of microgrid. In 2017 International Conference on Technological Advancements in Power and Energy (TAP Energy), pages 1-6, Dec 2017.
- [43] Lin-Yu Lu. Consensus-based pf and qv droop control for multiple parallel-connected inverters in lossy networks. In *Industrial Electronics (ISIE)*, 2013 IEEE International Symposium on, pages 1–6. IEEE, 2013.
- [44] T Govindaraj and D Hemalatha. Dynamic reactive power control of islanded microgrid using ipfc. International Journal Of Innovative Research In Electrical, Electronics, Instrumentation And Control Engineering, 2(1), 2014.
- [45] M. Adly and K. Strunz. Irradiance-adaptive pv module integrated converter for high efficiency and power quality in standalone and dc microgrid applications. *IEEE Transactions* on *Industrial Electronics*, 65(1):436–446, Jan 2018.
- [46] Xiaofeng Sun, Yancong Hao, Qingfeng Wu, Xiaoqiang Guo, and Baocheng Wang. A multifunctional and wireless droop control for distributed energy storage units in islanded ac microgrid applications. *IEEE Transactions on Power Electronics*, 32(1):736–751, 2017.

- [47] Marcelo A Perez and Freddy Flores-Bahamonde. Fs-model predictive control of microgrid interface converters for reactive power and harmonic compensation. In *Industrial Electronics* (ISIE), 2016 IEEE 25th International Symposium on, pages 1206–1211. IEEE, 2016.
- [48] Hamdi Abdi, Soheil Derafshi Beigvand, and Massimo La Scala. A review of optimal power flow studies applied to smart grids and microgrids. *Renewable and Sustainable Energy Reviews*, 2016.
- [49] Mohammad H Moradi, Vahid Bahrami Foroutan, and Mohammad Abedini. Power flow analysis in islanded micro-grids via modeling different operational modes of dgs a review and a new approach. *Renewable and Sustainable Energy Reviews*, 69:248–262, 2017.
- [50] N. Saxena, B. Singh, and A. L. Vyas. Single-phase solar pv system with battery and exchange of power in grid-connected and standalone modes. *IET Renewable Power Generation*, 11(2):325–333, 2017.
- [51] Mehdi Baharizadeh, Hamidreza Karshenas, and Jafar Ghaisari. Limit cycle occurrence during reactive power generation by interlinking converter in hybrid microgrids. *Canadian Journal of Electrical and Computer Engineering*, 39(2):181–189, 2016.
- [52] Divya R Nair, S Devi, Manjula G Nair, and K Ilango. Tariff based fuzzy logic controller for active power sharing between microgrid to grid with improved power quality. In *Energy Efficient Technologies for Sustainability (ICEETS), 2016 International Conference on*, pages 406–409. IEEE, 2016.
- [53] GA Bakare, GK Venayagamoorthy, and UO Aliyu. Reactive power and voltage control of the nigerian grid system using micro-genetic algorithm. In *Power Engineering Society General Meeting*, 2005. IEEE, pages 1916–1922. IEEE, 2005.
- [54] Yunwei Li, D Mahinda Vilathgamuwa, and Poh Chiang Loh. Microgrid power quality enhancement using a three-phase four-wire grid-interfacing compensator. *IEEE Transactions* on Industry Applications, 41(6):1707–1719, 2005.

- [55] Dong Guan, Zixing Cai, and Zhizhou Kong. Reactive power and voltage control using micro-genetic algorithm. In *Mechatronics and Automation*, 2009. ICMA 2009. International Conference on, pages 5019–5024. IEEE, 2009.
- [56] D Lu and B Francois. Strategic framework of an energy management of a microgrid with a photovoltaic-based active generator. In Advanced Electromechanical Motion Systems & Electric Drives Joint Symposium, 2009. ELECTROMOTION 2009. 8th International Symposium on, pages 1–6. IEEE, 2009.
- [57] Hamza Chaal and Milutin Jovanovic. A new sensorless torque and reactive power controller for doubly-fed machines. In *Electrical Machines (ICEM)*, 2010 XIX International Conference on, pages 1–6. IEEE, 2010.
- [58] Paolo Tenti, Helmo K Morales Paredes, Fernando P Marafão, and Paolo Mattavelli. Accountability and revenue metering in smart micro-grids. In Applied Measurements For Power Systems (AMPS), 2010 IEEE International Workshop on, pages 74–79. IEEE, 2010.
- [59] MS Kandil, MM El-Saadawi, AE Hassan, and KM Abo-Al-Ez. A proposed reactive power controller for dg grid connected systems. In *Energy Conference and Exhibition (EnergyCon)*, 2010 IEEE International, pages 446–451. IEEE, 2010.
- [60] Yang Xiu, Zong Xiang, Yang Fei, and Zang Hai-yang. A research on droop control strategy and simulation for the micro-grid. In *Electrical and Control Engineering (ICECE)*, 2011 International Conference on, pages 5695–5700. IEEE, 2011.
- [61] M Venkata Kirthiga, S Gurunathan, and S Arul Daniel. Optimal re-configuration of micro-grids based on ranking of buses. In *Innovative Smart Grid Technologies-India (ISGT India)*, 2011 IEEE PES, pages 137–143. IEEE, 2011.
- [62] Mahdi Saghaleini and Behrooz Mirafzal. Reactive power control in three-phase gridconnected current source boost inverter. In Applied Power Electronics Conference and Exposition (APEC), 2012 Twenty-Seventh Annual IEEE, pages 904–910. IEEE, 2012.

- [63] Amin Kargarian, Bamdad Falahati, Yong Fu, and Mohamadreza Baradar. Multiobjective optimal power flow algorithm to enhance multi-microgrids performance incorporating ipfc.
 In Power and Energy Society General Meeting, 2012 IEEE, pages 1–6. IEEE, 2012.
- [64] Saverio Bolognani and Sandro Zampieri. A distributed control strategy for reactive power compensation in smart microgrids. *IEEE Transactions on Automatic Control*, 58(11):2818– 2833, 2013.
- [65] Xiong Hu, Hong Zhou, Zhi-Wei Liu, Zhi-Hong Guan, and Ming Chi. Reactive power compensation in microgrids via distributed control strategy. In *Intelligent Control and Automation (WCICA)*, 2016 12th World Congress on, pages 1635–1640. IEEE, 2016.
- [66] N Dizdarevic and M Majstrovic. Facts-based reactive power compensation of wind energy conversion system. In *Power Tech Conference Proceedings*, 2003 IEEE Bologna, volume 2, pages 8–pp. IEEE, 2003.
- [67] Yeliz Yoldaş, Ahmet Önen, SM Muyeen, Athanasios V Vasilakos, and İrfan Alan. Enhancing smart grid with microgrids: Challenges and opportunities. *Renewable and Sustainable Energy Reviews*, 72:205–214, 2017.
- [68] Faridaddin Katiraei, Mohammad Reza Iravani, and Peter W Lehn. Micro-grid autonomous operation during and subsequent to islanding process. *IEEE Transactions on power delivery*, 20(1):248–257, 2005.
- [69] Jeffrey M Bloemink and Timothy C Green. Effects of power electronic compensation on distribution network thermal and voltage violations. In *Power and Energy Society General Meeting (PES), 2013 IEEE*, pages 1–5. IEEE, 2013.
- [70] Kyungsoo Lee, Hirotaka Koizumi, and Kosuke Kurokawa. Voltage sag/swell controller by means of d-upfc in the distribution system. In *Photovoltaic Energy Conversion, Conference Record of the 2006 IEEE 4th World Conference on*, volume 2, pages 2427–2430. IEEE, 2006.

- [71] D Menniti, A Burgio, A Pinnarelli, and N Sorrentino. Grid-interfacing active power filters to improve the power quality in a microgrid. In *Harmonics and Quality of Power, 2008. ICHQP 2008. 13th International Conference on*, pages 1–6. IEEE, 2008.
- [72] Nikhil K Ardeshna and Badrul H Chowdhury. Optimizing micro-grid operations in the presence of wind generation. In *Power Symposium*, 2008. NAPS'08. 40th North American, pages 1–7. IEEE, 2008.
- [73] Bhim Singh, Gaurav Kumar Kasal, Ambrish Chandra, and Kamal Al-Haddad. Voltage and frequency controller for an autonomous micro hydro generating system. In Power and Energy Society General Meeting-Conversion and Delivery of Electrical Energy in the 21st Century, 2008 IEEE, pages 1–9. IEEE, 2008.
- [74] Niancheng Zhou, Peng Wang, Qianggang Wang, and Poh Chiang Loh. Transient stability study of distributed induction generators using an improved steady-state equivalent circuit method. *IEEE Transactions on Power Systems*, 29(2):608–616, 2014.
- [75] Tomonobu Senjyu, Yuri Yonaha, and Atsushi Yona. Stable operation for distributed generators on distribution system using upfc. In *Transmission & Distribution Conference* & Exposition: Asia and Pacific, 2009, pages 1–4. IEEE, 2009.
- [76] Zhen Li, Siu-Chung Wong, and K Tse Chi. Bifurcation study of wind energy generation systems. In *Circuits and Systems (ISCAS), 2011 IEEE International Symposium on*, pages 2717–2720. IEEE, 2011.
- [77] Paolo Tenti, Paolo Mattavelli, and Helmo K Morales Paredes. Conservative power theory, sequence components and accountability in smart grids. In Nonsinusoidal Currents and Compensation (ISNCC), 2010 International School on, pages 37–45. IEEE, 2010.
- [78] Jalpa Shah, Ranjan K Gupta, Krushna K Mohapatra, and Ned Mohan. Power management with a dynamic power limit by a power electronic transformer for micro-grid. In *Power* and Energy Society General Meeting, 2010 IEEE, pages 1–5. IEEE, 2010.

- [79] Zhou Ke, Wenqian Jiang, Zhipeng Lv, An Luo, and Zhen Kang. Notice of retraction a micro-grid reactive voltage collaborative control system configuring dstatcom. In Mechanic Automation and Control Engineering (MACE), 2011 Second International Conference on, pages 1887–1890. IEEE, 2011.
- [80] Amarnath Tamersi, Ghadir Radman, and Mehriar Aghazadeh. Enhancement of microgrid dynamic voltage stability using microgrid voltage stabilizer. In Southeastcon, 2011 Proceedings of IEEE, pages 368–373. IEEE, 2011.
- [81] M Manigandan and B Basavaraja. Active and reactive power control of microgrid using wireless technology (zigbee 2.4 ghz). 2011.
- [82] P JenoPaul, I Jacob Raglend, and T Ruban Deva Prakash. Constant frequency-unified power quality conditioner for wind turbine generator connected with micro grid. In *Recent* Advancements in Electrical, Electronics and Control Engineering (ICONRAEeCE), 2011 International Conference on, pages 150–155. IEEE, 2011.
- [83] P JenoPaul, I Jacob Raglend, and T Ruban Deva Prakash. Universal power line manager for micro grid. In International Conference on Recent Advancements in Electrical, Electronics and Control Engineering, Sivakasi, pages 30–35, 2011.
- [84] José M Sánchez, María E Díaz, M Lafoz, and C Veganzones. Development of a grid connected micro wind generator. a practical activity for the course on electric generation with wind energy. In *Power Electronics and Applications (EPE 2011), Proceedings of the* 2011-14th European Conference on, pages 1–8. IEEE, 2011.
- [85] Sharad W Mohod and Mohan V Aware. Micro wind power generator with battery energy storage for critical load. *IEEE systems journal*, 6(1):118–125, 2012.
- [86] Tuo Dong, Linchuan Li, and Zhengbo Ma. A combined system of apf and svc for power quality improvement in microgrid. In *Power Engineering and Automation Conference* (*PEAM*), 2012 IEEE, pages 1–4. IEEE, 2012.

- [87] Rush D Robinett and David G Wilson. Nonlinear power flow control design for combined conventional and variable generation systems: Part i-theory. In Control Applications (CCA), 2011 IEEE International Conference on, pages 61–64. IEEE, 2011.
- [88] H Nazaripouya and S Mehraeen. Control of upfc using hamilton-jacobi-bellman formulation based neural network. In *Power and Energy Society General Meeting*, 2012 IEEE, pages 1–8. IEEE, 2012.
- [89] Istvan Vokony and Andras Dan. Reactive power-and voltage regulation in smart grid environment. In *PowerTech (POWERTECH)*, 2013 IEEE Grenoble, pages 1–9. IEEE, 2013.
- [90] Francesco Trentini, Michele Tasca, Stefano Tomasin, and Tomaso Erseghe. Reactive power compensation in smart micro grids: A prime-based testbed. In *Energy Conference and Exhibition (ENERGYCON), 2012 IEEE International*, pages 909–914. IEEE, 2012.
- [91] Shao Zhang, Xi Lu, Yang Liu, Baoming Ge, and Fang Zheng Peng. Nine igbts based upfc topology and control for renewable power integration. In Applied Power Electronics Conference and Exposition (APEC), 2013 Twenty-Eighth Annual IEEE, pages 1294–1300. IEEE, 2013.
- [92] MC Falvo, L Martirano, D Sbordone, I Bertini, B Di Pietra, and F Vellucci. A flexible customer power device for energy management in a real smart micro-grid. In *Industrial Electronics Society, IECON 2013-39th Annual Conference of the IEEE*, pages 7586–7591. IEEE, 2013.
- [93] Farhad Shahnia, Ruwan PS Chandrasena, Sumedha Rajakaruna, and Arindam Ghosh. Autonomous operation of multiple interconnected microgrids with self-healing capability. In Power and Energy Society General Meeting (PES), 2013 IEEE, pages 1–5. IEEE, 2013.
- [94] Pushkar Chaudhari, Paris Rane, Amit Bawankar, Pranit Shete, Kundan Kalange, Archit Moghe, Jyotiprakash Panda, Aditya Kadrolkar, Kishor Gaikwad, Navnath Bhor, et al. Design and implementation of statcom for reactive power compensation and voltage fluctuation mitigation in microgrid. In Signal Processing, Informatics, Communication

and Energy Systems (SPICES), 2015 IEEE International Conference on, pages 1–5. IEEE, 2015.

- [95] J Balcells and P Bogonez-Franco. Voltage control in a lv microgrid by means of an svc. In Industrial Electronics Society, IECON 2013-39th Annual Conference of the IEEE, pages 6027–6030. IEEE, 2013.
- [96] Jeffrey M Bloemink and Timothy C Green. Benefits of distribution-level power electronics for supporting distributed generation growth. *IEEE Transactions on Power Delivery*, 28(2):911–919, 2013.
- [97] K Palanisamy, DP Kothari, Mahesh K Mishra, S Meikandashivam, and I Jacob Raglend. Effective utilization of unified power quality conditioner for interconnecting pv modules with grid using power angle control method. International Journal of Electrical Power & Energy Systems, 48:131–138, 2013.
- [98] Shafiuzzaman K Khadem, Malabika Basu, and Michael F Conlon. Integration of upqc for power quality improvement in distributed generation network-a review. In *Innovative* Smart Grid Technologies (ISGT Europe), 2011 2nd IEEE PES International Conference and Exhibition on, pages 1–5. IEEE, 2011.
- [99] Malabika Basu and Michael F Conlon. Upqc for power quality improvement in dg integrated smart grid network-a review. Journal of Emerging Electric Power Systems: Vol, 13(1):3, 2012.
- [100] Vinod Khadkikar. Enhancing electric power quality using upqc: A comprehensive overview. IEEE transactions on Power Electronics, 27(5):2284–2297, 2012.
- [101] Payal Deshpande, Amit Shrivastava, and Anula Khare. Different modeling aspects and energy systems of unified power quality conditioner (upqc): An overview. International Journal of Renewable Energy Research (IJRER), 3(2):395–402, 2013.

- [102] Chandra Babu Paduchuri, Subhransu Sekhar Dash, and Subramani Chinnamuthu. A new control strategy based multi converter upqc using fuzzy logic controller to improve the power quality issues. Advances in Electrical and Electronic Engineering, 12(2):86, 2014.
- [103] B Santhosh Kumar and K Vijay Kumar. A structure for three-phase four-wire distribution system utilizing unified power quality conditioner (upqc). Int. J. Engg. Research and Appl., 4(2):27–33, 2014.
- [104] N. G. Jayanti, M. Basu, M. F. Conlon, and K. Gaughan. Statcom and upqc: Options to enhance fault-ride-through capability of a fixed speed wind generator. In 6th IET International Conference on Power Electronics, Machines and Drives (PEMD 2012), pages 1-6, March 2012.
- [105] Shafiuzzaman K Khadem, Malabika Basu, and Michael F Conlon. Intelligent islanding and seamless reconnection technique for microgrid with upqc. *IEEE Journal of Emerging and Selected Topics in Power Electronics*, 3(2):483–492, 2015.
- [106] Bijan Rahmani, Weixing Li, and Guihua Liu. An advanced universal power quality conditioning system and mppt method for grid integration of photovoltaic systems. International Journal of Electrical Power & Energy Systems, 69:76–84, 2015.
- [107] Peng Li, Yuwei Li, and Ziheng Yin. Realization of upqc h8 coordinated control in microgrid. International Journal of Electrical Power & Energy Systems, 65:443–452, 2015.
- [108] Bruno W França, Leonardo F da Silva, Maynara A Aredes, and Maurício Aredes. An improved iupqc controller to provide additional grid-voltage regulation as a statcom. *IEEE Transactions on Industrial Electronics*, 62(3):1345–1352, 2015.
- [109] MB Camara, B Dakyo, C Nichita, and G Barakat. Simulation of a doubly-fed induction generator with hydro turbine for electrical energy production. In Advanced Electromechanical Motion Systems & Electric Drives Joint Symposium, 2009. ELECTROMOTION 2009. 8th International Symposium on, pages 1–6. IEEE, 2009.

- [110] CP Ion and C Marinescu. Control of parallel operating micro hydro power plants. In Optimization of Electrical and Electronic Equipment (OPTIM), 2010 12th International Conference on, pages 1204–1209. IEEE, 2010.
- [111] Monika Jain, Sushma Gupta, and Gayatri Agnihotri. Design of voltage controller for parallel operated self excited induction generator microgrid. In *Energy, Automation, and Signal (ICEAS), 2011 International Conference on*, pages 1–6. IEEE, 2011.
- [112] SA O Dasilva and FA Negrao Single-phase to three-phase unified power quality conditioner applied in single-wire earth return electric power distribution grids. *IEEE Transactions on Power Electronics*, 33(5):3950–3960, May 2018.
- [113] M. Qasim and V. Khadkikar. Application of artificial neural networks for shunt active power filter control. *IEEE Transactions on Industrial Informatics*, 10(3):1765–1774, Aug 2014.
- [114] P. Kanjiya, V. Khadkikar, and H. H. Zeineldin. Optimal control of shunt active power filter to meet ieee std. 519 current harmonic constraints under nonideal supply condition. *IEEE Transactions on Industrial Electronics*, 62(2):724–734, Feb 2015.
- [115] S. K. Khadem, M. Basu, R. Kerrigan, and B. Basu. Placement of statcom to improve the power quality of a dg integrated building energy system in virtual environment. In 2014 IEEE 23rd International Symposium on Industrial Electronics (ISIE), pages 2676–2681, June 2014.
- [116] S. K. Khadem, M. Basu, and M. F. Conlon. Harmonic power compensation capacity of shunt active power filter and its relationship with design parameters. *IET Power Electronics*, 7(2):418–430, February 2014.
- [117] S. Biricik, S. Redif, S. K. Khadem, and M. Basu. Control of the single phase parallel active filter under weak grid voltages. In 2014 IEEE 5th International Symposium on Power Electronics for Distributed Generation Systems (PEDG), pages 1–5, June 2014.

- [118] S. K. Khadem, M. Basu, and M. F. Conlon. Reduction of circulating current flow in parallel operation of apf based on hysteresis current control. In *Power Engineering Conference* (UPEC), 2013 48th International Universities', pages 1–6, Sept 2013.
- [119] A. V. P. Kumar, A. M. Parimi, and K. U. Rao. Implementation of mppt control using fuzzy logic in solar-wind hybrid power system. In Signal Processing, Informatics, Communication and Energy Systems (SPICES), 2015 IEEE International Conference on, pages 1–5, Feb 2015.
- [120] P. Bharadwaj, K. N. Chaudhury, and V. John. Sequential optimization for pv panel parameter estimation. *IEEE Journal of Photovoltaics*, 6(5):1261–1268, Sept 2016.
- [121] R. Kumar Agarwal, I. Hussain, and B. Singh. Three-phase single-stage grid tied solar pv ecs using pll-less fast ctf control technique. *IET Power Electronics*, 10(2):178–188, 2017.
- [122] U. Sharma, B. Singh, and S. Kumar. Intelligent grid interfaced solar water pumping system. IET Renewable Power Generation, 11(5):614–624, 2017.
- [123] M.A.Islam, N. Mohammad, and P. K. S. Khan. Modeling and performance analysis of a generalized photovoltaic array in matlab. In 2010 Joint International Conference on Power Electronics, Drives and Energy Systems 2010 Power India, pages 1–5, Dec 2010.
- [124] M. Suthar, G. K. Singh, and R. P. Saini. Comparison of mathematical models of photovoltaic (pv) module and effect of various parameters on its performance. In 2013 International Conference on Energy Efficient Technologies for Sustainability, pages 1354–1359, April 2013.
- [125] S. Bal, A. Anurag, and B. C. Babu. Comparative analysis of mathematical modeling of photo-voltaic (pv) array. In 2012 Annual IEEE India Conference (INDICON), pages 269–274, Dec 2012.
- [126] M. H. Beshr, H. A. Khater, and A. A. Abdelraouf. Modelling of a residential solar standalone power system. In 2010 1st International Nuclear Renewable Energy Conference (INREC), pages 1–6, March 2010.

- [127] W. Xiao, F. F. Edwin, G. Spagnuolo, and J. Jatskevich. Efficient approaches for modeling and simulating photovoltaic power systems. *IEEE Journal of Photovoltaics*, 3(1):500–508, Jan 2013.
- [128] N. Wang, M. Wu, and G. Shi. Study on characteristics of photovoltaic cells based on matlab simulation. In 2011 Asia-Pacific Power and Energy Engineering Conference, pages 1–4, March 2011.
- [129] A-300 Solar cell.
- [130] A. V. Pavan Kumar, A. M. Parimi, and K. Uma Rao. Performance analysis of a two-diode model of pv cell for pv based generation in matlab. In Advanced Communication Control and Computing Technologies (ICACCCT), 2014 International Conference on, pages 68–72, May 2014.
- [131] A. K. Mishra and B. Singh. Solar photovoltaic array dependent dual output converter based water pumping using switched reluctance motor drive. *IEEE Transactions on Industry Applications*, 53(6):5615–5623, Nov 2017.
- [132] S. Ransome. Comparing pv simulation models and methods with outdoor measurements.
 In 2010 35th IEEE Photovoltaic Specialists Conference, pages 002306–002311, June 2010.
- [133] Hyeonah Park and Hyosung Kim. Pv cell modeling on single-diode equivalent circuit. In IECON 2013 - 39th Annual Conference of the IEEE Industrial Electronics Society, pages 1845–1849, Nov 2013.
- [134] N. M. A. Alrahim Shannan, N. Z. Yahaya, and B. Singh. Single-diode model and two-diode model of pv modules: A comparison. In 2013 IEEE International Conference on Control System, Computing and Engineering, pages 210–214, Nov 2013.
- [135] M. Abouzeid, V. Sood, and M. Youssef. A comparative study of a pv-mppt grid-integrated system under different control techniques. In 2015 IEEE Electrical Power and Energy Conference (EPEC), pages 256–261, Oct 2015.

- [136] N. Jeddi and L. El Amraoui Ouni. Comparative study of mppt techniques for pv control systems. In 2014 International Conference on Electrical Sciences and Technologies in Maghreb (CISTEM), pages 1–7, Nov 2014.
- [137] M. Ferchichi, N. Zaidi, and A. Khedher. Comparative analysis for various control strategies based mppt technique of photovoltaic system using dc-dc boost converter. In 2016 17th International Conference on Sciences and Techniques of Automatic Control and Computer Engineering (STA), pages 532–539, Dec 2016.
- [138] J. S. Lai and D. Chen. Design consideration for power factor correction boost converter operating at the boundary of continuous conduction mode and discontinuous conduction mode. In *Proceedings Eighth Annual Applied Power Electronics Conference and Exposition*,, pages 267–273, Mar 1993.
- [139] S. W. Mohod and M. V. Aware. Energy storage to strengthen the wind generator in integrated power system. In 2010 IEEE International Conference on Sustainable Energy Technologies (ICSET), pages 1–7, Dec 2010.
- [140] A. V. P. Kumar, A. M. Parimi, and K. U. Rao. A comparative analysis of load frequency control strategy of a voltage source inverter for a stand-alone pv-wind hybrid system. In 2016 IEEE 6th International Conference on Power Systems (ICPS), pages 1–6, March 2016.
- [141] J. Arellano-Padilla, M. Sumner, C. Gerada, and L. Jing. A novel approach to gearbox condition monitoring by using drive rectifier input currents. In 2009 13th European Conference on Power Electronics and Applications, pages 1–10, Sept 2009.
- [142] N. G. Hingorani. Introducing custom power. *IEEE Spectrum*, 32(6):41–48, June 1995.
- [143] BiYing Ren, Xiangqian Tong, Sha Tian, and Xiangdong Sun. Research on the control strategy of inverters in the micro-grid. In *Power and Energy Engineering Conference* (APPEEC), 2010 Asia-Pacific, pages 1–4. IEEE, 2010.
- [144] N. G. Hingorani. High power electronics and flexible ac transmission system. IEEE Power Engineering Review, 8(7):3–4, July 1988.

- [145] Narain G Hingorani and Vice President. High Power Electronics and Flexible AC Transmission System North American Electric Reliability Council News. (July):3–4, 1988.
- [146] KR Padiyar. Facts Controllers in Power Transmission and Distribution.
- [147] P. Kanjiya, B. Singh, A. Chandra, and Kamal-Al-Haddad. Srf theory revisited to control self supported dynamic voltage restorer (dvr) for unbalanced and nonlinear loads. In 2011 IEEE Industry Applications Society Annual Meeting, pages 1–8, Oct 2011.
- [148] Kyung-Min Jin, Quach Ngoc Thinh, and Eel-Hwan Kim. Dvr control of dfig for compensating fault ride-through based on stationary and synchronous reference frame. In Proceedings of The 7th International Power Electronics and Motion Control Conference, volume 2, pages 3004–3009, June 2012.
- [149] F. Badrkhani Ajaei, S. Farhangi, and R. Iravani. Fault current interruption by the dynamic voltage restorer. *IEEE Transactions on Power Delivery*, 28(2):903–910, April 2013.
- [150] D. M. Vilathgamuwa, P. C. Loh, and Y. Li. Protection of microgrids during utility voltage sags. *IEEE Transactions on Industrial Electronics*, 53(5):1427–1436, Oct 2006.
- [151] Xiaoqing Han, Ruifen Cheng, Peng Wang, and Yanbing Jia. Advanced dynamic voltage restorer to improve power quality in microgrid. In 2013 IEEE Power Energy Society General Meeting, pages 1–5, July 2013.
- [152] J. G. Nielsen, F. Blaabjerg, and N. Mohan. Control strategies for dynamic voltage restorer compensating voltage sags with phase jump. In APEC 2001. Sixteenth Annual IEEE Applied Power Electronics Conference and Exposition (Cat. No.01CH37181), volume 2, pages 1267–1273 vol.2, 2001.
- [153] E. K. K. Sng, S. S. Choi, and D. M. Vilathgamuwa. Analysis of series compensation and dc-link voltage controls of a transformerless self-charging dynamic voltage restorer. *IEEE Transactions on Power Delivery*, 19(3):1511–1518, July 2004.

- [154] Y. Singh, I. Hussain, B. Singh, and S. Mishra. Single-phase solar grid-interfaced system with active filtering using adaptive linear combiner filter-based control scheme. *IET Generation*, *Transmission Distribution*, 11(8):1976–1984, 2017.
- [155] S. S. Choi, B. H. Li, and D. M. Vilathgamuwa. Dynamic voltage restoration with minimum energy injection. In 2000 IEEE Power Engineering Society Winter Meeting. Conference Proceedings (Cat. No.00CH37077), volume 2, pages 1156 vol.2–, Jan 2000.
- [156] Y. Singh, I. Hussain, S. Mishra, and B. Singh. Adaptive neuron detection-based control of single-phase spv grid integrated system with active filtering. *IET Power Electronics*, 10(6):657–666, 2017.
- [157] M. Shafiee Khoor and M. Machmoum. A low voltage dynamic voltage restorer with selfcharging capability. In 2007 European Conference on Power Electronics and Applications, pages 1–9, Sept 2007.
- [158] H. Fujita and H. Akagi. The unified power quality conditioner: the integration of series and shunt-active filters. *IEEE Transactions on Power Electronics*, 13(2):315–322, Mar 1998.
- [159] N. Gotherwal, J. K. Nama, S. Ray, and N. Gupta. Performance comparison of reference current extraction techniques for indirect current control based shunt active filter. In 2016 IEEE 7th Power India International Conference (PIICON), pages 1–6, Nov 2016.
- [160] W. L. Chen and M. J. Wang. Design of dynamic voltage restorer and active power filter for wind power systems subject to unbalanced and harmonic distorted grid. In 2016 IEEE Applied Power Electronics Conference and Exposition (APEC), pages 3471–3475, March 2016.
- [161] V. Khadkikar, A. Chandra, and B. N. Singh. Generalised single-phase p-q theory for active power filtering: simulation and dsp-based experimental investigation. *IET Power Electronics*, 2(1):67–78, January 2009.

- [162] V. Khadkikar and A. Chandra. An independent control approach for three-phase four-wire shunt active filter based on three h-bridge topology under unbalanced load conditions. In 2008 IEEE Power Electronics Specialists Conference, pages 4643–4649, June 2008.
- [163] S. Kumar and B. Singh. Harmonics detection based control of solar-bess microgrid with grid synchronization. In 2017 7th International Conference on Power Systems (ICPS), pages 684–690, Dec 2017.
- [164] P. Anjana, V. Gupta, H. P. Tiwari, and N. Gupta. Pv source integrated micro-grid for power quality improvement. In 2016 IEEE/PES Transmission and Distribution Conference and Exposition (T D), pages 1–5, May 2016.
- [165] H. P. Tiwari, P. Anjana, and V. Gupta. Power quality improvement of micro-grid using apf's with apc theory. In International Conference on Recent Advances and Innovations in Engineering (ICRAIE-2014), pages 1–6, May 2014.
- [166] J. C. Montano. Reviewing concepts of instantaneous and average compensations in polyphase systems. *IEEE Transactions on Industrial Electronics*, 58(1):213–220, Jan 2011.
- [167] F. Z. Peng, H. Akagi, and A. Nabae. A new approach to harmonic compensation in power systems-a combined system of shunt passive and series active filters. *IEEE Transactions on Industry Applications*, 26(6):983–990, Nov 1990.
- [168] H. Akagi. New trends in active filters for power conditioning. IEEE Transactions on Industry Applications, 32(6):1312–1322, Nov 1996.
- [169] F. Kamran and T. G. Habetler. Combined deadbeat control of a series-parallel converter combination used as a universal power filter. In *Power Electronics Specialists Conference*, 1995. PESC '95 Record., 26th Annual IEEE, volume 1, pages 196–201 vol.1, Jun 1995.
- [170] M. Aredes, K. Heumann, and E. H. Watanabe. An universal active power line conditioner. *IEEE Transactions on Power Delivery*, 13(2):545–551, Apr 1998.
- [171] L. M. Tolbert, Fang Zheng Peng, and T. G. Habetler. A multilevel converter-based universal power conditioner. *IEEE Transactions on Industry Applications*, 36(2):596–603, Mar 2000.

- [172] D. Graovac, V. Katic, and A. Rufer. Power quality compensation using universal power quality conditioning system. *IEEE Power Engineering Review*, 20(12):58–60, Dec 2000.
- [173] S. Vanapalli, M. V. G. Rao, and S. P. Karthikeyan. Performance analysis of unified power quality conditioner controlled with ann and fuzzy logic based control approaches. In *TENCON 2017 - 2017 IEEE Region 10 Conference*, pages 1337–1341, Nov 2017.
- [174] N. Alawadhi and A. Elnady. Mitigation of power quality problems using unified power quality conditioner by an improved disturbance extraction technique. In 2017 International Conference on Electrical and Computing Technologies and Applications (ICECTA), pages 1–5, Nov 2017.
- [175] S. Ivanov, M. Ciontu, D. Sacerdotianu, and A. Radu. Simple control strategies of the active filters within a unified power quality conditioner (upqc). In 2017 International Conference on Modern Power Systems (MPS), pages 1–4, June 2017.
- [176] T. Zhili and Z. Dongjiao. A new control strategy for three-phase four-wire upqc when voltage fluctuating on its dc side. In *The 2nd International Symposium on Power Electronics* for Distributed Generation Systems, pages 190–195, June 2010.
- [177] T. Zhili, Li Xun, C. Jian, K. Yong, and D. Shanxu. A direct control strategy for upqc in three-phase four-wire system. In 2006 CES/IEEE 5th International Power Electronics and Motion Control Conference, volume 2, pages 1–5, Aug 2006.
- [178] M. Basu, S. P. Das, and G. K. Dubey. Investigation on the performance of upqc-q for voltage sag mitigation and power quality improvement at a critical load point. *IET Generation*, *Transmission Distribution*, 2(3):414–423, May 2008.
- [179] V. Khadkikar. Enhancing electric power quality using upqc: A comprehensive overview. IEEE Transactions on Power Electronics, 27(5):2284–2297, May 2012.
- [180] Yajiao Zhong, Mingchao Xia, and Hsiao-Dong Chiang. Electric vehicle charging station microgrid providing unified power quality conditioner support to local power distribution networks. International Transactions on Electrical Energy Systems, pages n/a-n/a, 2016.

- [181] Qi-Ming Cheng, Ying-Fei Wang, Yin-Man Cheng, Kai Wu, and Yuan-Fei Bai. Modified double hysteresis current control method for unified power quality controller. *International Transactions on Electrical Energy Systems*, 25(4):713–730, 2015.
- [182] Reza Ghanizadeh, Mahmoud Ebadian, and Gevork B. Gharehpetian. Non-linear load sharing and voltage harmonics compensation in islanded microgrids with converter interfaced units. *International Transactions on Electrical Energy Systems*, pages n/a–n/a, 2016.