

Dr. Alka Singh

EDUCATIONAL QUALIFICATIONS

- Ph.D, , **Delhi University**, Guides from NSIT & IITD
Netaji Subhas Institute of Technology, New Delhi.
- M.Tech (Power Systems Engineering), **IIT, Delhi** CGPA: 9.375/10
Topper in Power Systems with Prakasa Rao award
- B.E. (Electrical Engineering) Aggregate: 79.7%
Delhi College of Engineering, Delhi

AREAS OF INTEREST

Power quality, power systems, power electronics applications to power systems

PROJECTS HANDLED

- Successfully completed a SERB-DST granted project for 3 years (2017-2020) titled “**Design, Development and Testing of Control and Synchronization of Power Electronics based Converters with Renewable Energy sources**”. The project was awarded “O” grade in final assessment.
- Completed one DST Project under Young Scientists Scheme of Department of Science and Technology for 25lac, titled “**Modeling and Development of power electronics based controllers for interfacing renewable energy sources to utility grid**” (2012 to 2016)
- Working on FIST project Sponsored by DST on the design and development of microgrid on wheels
- **Published approx. 120 papers in National/ International Conferences and Journals/ Transactions in the research areas of power system/ power quality**

AWARDS AND INTERESTS

- Awarded coveted **Research Excellence Awards** conferred by DTU for the last five years continuously for research work
- **Outstanding Engineer Award 2022** by IEEE PES Chapter
- **K.S.Prakasa Rao** Award in IIT, Delhi for M.Tech topper in Power Systems branch (2001)
- **Sarita Kalra** Trust award in DCE for Electrical Engineering
- Active IEEE Senior Member, Presently serving as IEEE Execom member of Delhi Section of Power and Energy Society (PES-IAS) of IEEE Delhi.

LIST OF PUBLICATIONS (last 5 years)

Journal Publications:

- [1] K. B. Rai, N. Kumar and A. Singh, "Three-Phase Grid Connected Shunt Active Power Filter Based on Adaptive Q-LMF Control Technique," in *IEEE Transactions on Power Electronics*, vol. 39, no. 8, pp. 10216-10225, Aug. 2024, doi: 10.1109/TPEL.2024.3398369.
- [2] P. Bansal and Alka Singh, "Control of DSTATCOM with parallel tangent method based adaptive control algorithm under distorted grid conditions," *Electric Power Components and Systems*, Feb 2024, doi: [10.1080/15325008.2024.2314208](https://doi.org/10.1080/15325008.2024.2314208).
- [3] P. Bansal and Alka Singh, Solar PV integrated simplified multilevel inverter configuration for power quality improvement using multilayer Gamma filter, *Electrical Engineering (Springer)*, August 2024, doi:[10.1007/s00202-024-02654-8](https://doi.org/10.1007/s00202-024-02654-8).
- [4] Ankita Arora and Alka Singh, "Fractional delay Newton structure for Lagrangian interpolation in PV integrated grid connected system," *International Journal of Circuit Theory and Applications*, Wiley, September 2023, doi.org/10.1002/cta.3827.
- [5] Kanchan Rai, Narendra Kumar and Alka Singh, "Design and Control of DVR Based on Adaptive Bateman Polynomial for Power Quality Improvement," *International Journal of Circuit Theory and Applications*, Wiley, September 2024, doi.org/10.1002/cta.4270.
- [6] Oinam Lotika Devi and Alka Singh, "Performance analysis of fractional-order modified SRF PLL under grid abnormalities," *International Journal of Circuit Theory and Applications*, Wiley, July 2024, doi.org/10.1002/cta.4161
- [7] Sudhanshu Mittal, Alka Singh and Prakash Chittora, "Design and development of reduced switch five level inverter for interfacing renewable energy sources and EV charger" *Electrical Engineering*, Springer, April 2024, doi.org/10.1007/s00202-024-02373-0
- [8] Sudhanshu Mittal, Alka Singh and Prakash Chittora, "Power quality enhancement in single phase two level/ five level converters using RBFNN algorithm" *Electrical Engineering*, Springer, May 2024, doi: [10.1007/s00202-024-02432-6](https://doi.org/10.1007/s00202-024-02432-6)
- [9] Kanchan Bala Rai, Kumar, N, Alka Singh, "Design and analysis of Hermite function-based artificial neural network controller for performance enhancement of photovoltaic-integrated grid system," *Int J Circuit Theory Appl.* 2023; 51(3): 1440-1459. doi:[10.1002/cta.3486](https://doi.org/10.1002/cta.3486)
- [10] Kanchan Bala Rai, Alka Singh, Kumar, N, "Bernoulli polynomial-based control technique for PV-integrated grid system under distorted supply," *Int J Circuit Theory Appl.* 2023; 51(7): 3204-3225. doi:[10.1002/cta.3578](https://doi.org/10.1002/cta.3578)
- [11] Kanchan Bala Rai, Narendra Kumar & Alka Singh (2022) Design and Analysis of the Shunt Active Power Filter with the ε -NSRLMMN Adaptive Algorithm for Power Quality Improvement in the Distribution System, *IETE Journal of Research*, DOI: [10.1080/03772063.2022.2152116](https://doi.org/10.1080/03772063.2022.2152116)
- [12] Alka Singh and Amarendra Pandey, "Performance of adaptive radial basis functional neural network for inverter control," *Electrical Engineering*, 105, pp. 921-933, 2023 DOI: [10.1007/s00202-022-01706-1](https://doi.org/10.1007/s00202-022-01706-1).

- [13] Prakash Chittora, Alka Singh, M. Singh, *et al.* Experimental Investigation of Modern Control Algorithms for Power Quality Improvement for Single-Phase Grid-Connected Photo-Voltaic System. *J. Inst. Eng. India Ser. B* 104, 715–729 (2023). <https://doi.org/10.1007/s40031-023-00887-y>
- [14] Ankita Arora and Alka Singh, “Design and analysis of Quadratic Bernstein Functional Blending Neural Network for shunt compensation and Phase Locked Loop”, *Electrical Engineering*, May 2022, [10.1007/s00202-022-01571-y](https://doi.org/10.1007/s00202-022-01571-y)
- [15] Neelam Kassarwani, “Comparative Performance Study of DVR Using Adaptive LMS Filtering-Based Algorithms”, *Electric Power Components and Systems*, Taylor and Francis, Published July 2023, <https://doi.org/10.1080/15325008.2023.2238694>
- [16] Sudhanshu Mittal, Alka Singh, Prakash Chittora, “Design and development of leaky least mean fourth control algorithm for single-phase grid-connected multilevel inverter" *International Journal of Circuit Theory and Applications*,(Article ID: CTA3746), Wiley, July 2023.
- [17] Hemant Saxena, Alka Singh, Prakash Chittora, “Modified LMS Synchronization Technique for Distributed Energy Resources with DC-offset and Harmonics Elimination Capability”, *ISA Transactions*, Elsevier, doi.org/10.1016/j.isatra.2022.09.042, Online 5Oct 22.
- [18] Alka Singh, “Design and Performance of Self Adaptive SRF-PLL Technique for Grid Synchronization”, *International Journal of Electronics*, Taylor and Francis, doi.org/10.1080/00207217.2022.2118852, Accepted June22, published online 9 Sep 22.
- [19] Alka Singh, “Applications of Adaptive Long Short-Term Memory to Active Filtering”, *Journal of The Institution of Engineers (India): Series B*, Springer, Volume 103, pages737–746 (2022), [doi:10.1007/s40031-021-00685-4](https://doi.org/10.1007/s40031-021-00685-4) , published 21Oct2021
- [20] Kanchan Bala Rai, Narendra Kumar, Alka Singh, "Design and Analysis of Hermite ANN Controller for Performance Enhancement of PV integrated Grid System" *International Journal of Circuit Theory and Applications*, Wiley, [doi:10.1002/cta.3486](https://doi.org/10.1002/cta.3486), Oct/Nov 2022.
- [21] Amarendra Pandey and Alka Singh, “SWRDFT Controller for Single Phase Grid Tied PV system with Low Voltage Ride through Capability”, *Electric Power Systems Research*, Volume 214, Part A, 1 January 2023, 108878, doi.org/10.1016/j.epsr.2022.108878
- [22] Amarendra Pandey and Alka Singh, “Laguerre polynomial function-based inverter control with low-voltage ride-through capabilities”, *International Journal of Circuit Theory and Applications*, John Wiley and Sons, doi.org/10.1002/cta.3463, published online 03Oct 2022.
- [23] Praveen Bansal and Alka Singh, “Nonlinear adaptive normalized Huber control algorithm for 5-level distribution static compensator”, *Electrical Engineering*, Springer, 104, 1635–1648, 2022, published online Nov2021, doi.org/10.1007/s00202-021-01424-0.
- [24] Ankita Arora and Alka Singh, “Development and Performance Analysis of Cubic Bezier Functional Expansion based Adaptive Filter for Grid Interfaced PV System”, *International Transactions on Electrical Energy Systems*, Wiley, doi.org/10.1002/2050-7038.12840, March 2021.
- [25] Praveen Bansal and Alka Singh, “Closed Loop Control Using RSAPS Algorithm for 5-Level CHB Multilevel Inverter”, *Journal of Control Automation and Electrical System*, Springer, 33, 998–1011 (2022), doi.org/10.1007/s40313-021-00864-0.
- [26] Hemant Saxena, Alka Singh , J N Rai, “RNN Based Control Algorithm for Power Quality Improvement in PV Integrated Distribution System,” *Electric Power Components and Systems*, Taylor and Francis, Vol.49, Issue 9-10, 2021, published online April 2022, doi.org/10.1080/15325008.2022.2049646.

- [27] Hemant Saxena, Alka Singh and Jitendra Nath Rai, “Enhanced Third Order Generalized Integrator based Grid Synchronization for DC-offset Rejection and Precise Frequency Estimation”, *Arabian Journal of Science and Engineering*, Springer, March 2021 (Journal impact factor: 2.334) , ISSN no. 13198025.
- [28] Hemant Saxena, Alka Singh and Jitendra Nath Rai, “PV integrated grid synchronization technique using modified SOGI-FLL and zero-crossing detector”, *Electrical Engineering*, Springer, 2021, pp.1-12, (Journal impact factor:1.836) , ISSN no 1432-0487, doi : 10.1007/s00202-021-01394-3
- [29] M. Badoni, A. Singh, A. K. Singh, H. Saxena and R. Kumar, "Grid tied solar PV system with power quality enhancement using adaptive generalized maximum Versoria criterion," in *CSEE Journal of Power and Energy Systems*, doi: 10.17775/CSEEJPES.2020.04820, (Journal impact factor: 3.938) , ISSN no. 20960042
- [30] M. Badoni, A. Singh, S. Pandey and B. Singh, "Fractional-Order Notch Filter for Grid-Connected Solar PV System With Power Quality Improvement," in *IEEE Transactions on Industrial Electronics*, vol. 69, no. 1, pp. 429-439, Jan. 2022, doi: 10.1109/TIE.2021.3051585, (Journal impact factor: 7.515) , ISSN no. 02780046.
- [31] Amarendra Pandey and Alka Singh, "Design and analysis of Lavenberg-Marquardt based adaptive SOGI", *IET Generation, Transmission & Distribution*, Nov 2020, vol14(issue26), eFirst 2021, pp.6569-6579,doi: 10.1049/iet-gtd.2020.0246 (Journal impact factor: 2.862) ISSN no.17518687
- [32] Praveen Bansal and Alka Singh, “Nonlinear adaptive normalized least mean absolute third algorithm for the control of five level distribution static compensator”, *International journal of Circuit Theory Applications*, John Wiley and Sons, 2021, pp.1-25, (Journal impact factor: 1.444) DOI: 10.1002/cta.3045, ISSN no. 1097007X
- [33] Praveen Bansal and Alka Singh, “Nonlinear adaptive normalized Huber control algorithm for 5-level distribution static compensator”, *Electrical Engineering*, Springer, 2021, pp.1-14, doi.org/10.1007/s00202-021-01424-0. (Journal impact factor:1.836) , ISSN no 1432-0487
- [34] Praveen Bansal and Alka Singh, “Multilevel inverter based power quality enhancement using improved immune control algorithm”, *International Journal of Electronics*,2021, pp.1-21, doi.org/10.1080/00207217.2020.1870754. (Journal Impact Factor: 1.004) , ISSN no. 00207217
- [35] Ankita Arora and Alka Singh, “Development and performance Analysis of Cubic Bezier functional expansion based adaptive filter for grid interfaced PV system”, *International Transactions on Electrical Energy Systems*, John Wiley and Sons, 2021, pp.1-20,doi.org/10.1002/2050-7038.12840, (Journal Impact Factor: 1.692) , ISSN no. 20507038
- [36] Alka Singh, “Applications of adaptive Long short term memory to active filtering”, *Journal of the Institution of Engineers (Series B)*, 2021, doi [10.1007/s40031-021-00685-4](https://doi.org/10.1007/s40031-021-00685-4), ISSN no.22502114
- [37] Shikha Gupta, Anjeet Verma, Bhim Singh, Rachana Garg , Alka Singh, “AES-FLL control of RES powered microgrid for power quality improvement with synchronization control”, *EPSR*, 203 (2022), 107681, pp. 1-13, doi.org/10.1016/j.epsr.2021.107681, (Journal Impact Factor: 3.414) , ISSN no. 03787796
- [38] Hemant Saxena, Alka Singh and J.N. Rai , “Analysis of SOGI-ROGI for Synchronization and Shunt Active Filtering under Distorted Grid Condition”, *ISA Transactions*, Elsevier, March 2021, Vol.109, pp.380-388. (Journal impact factor: 4.305) , ISSN no. 190578

- [39] Hemant Saxena, Alka Singh and J.N. Rai, "Design of Adaptive Spline Based PLL for Synchronization and Power Quality Improvement in Distribution System", IET Generation, Transmission & Distribution, Jan 2020, vol14(issue7), pp.1311-1319, DOI: 10.1049/iet-gtd.2019.0662. (Journal impact factor: 2.862) ISSN no.17518687
- [40] Manoj Badoni; Alka Singh; Bhim Singh, "Power Quality Enhancement Using Euclidean Direction Search Based Control Technique", IEEE Transactions on Industrial Electronics, Year: 2020 | Volume: 67, Issue: 3, pp.2231-2240, DOI:10.1109/TIE.2019.2905835 (Journal impact factor: 7.515) , ISSN no. 02780046
- [41] Manoj Badoni; Alka Singh; Bhim Singh; Hemant Saxena, "Real-time implementation of active shunt compensator with adaptive SRLMMN control technique for power quality improvement in the distribution system", IET Generation, Transmission & Distribution, 2020, Volume: 14, Issue 8, pp.1598-1606, doi: 10.1049/iet-gtd.2019.0929 (Journal impact factor: 2.862) , ISSN no.17518687
- [42] Hemant Saxena, Alka Singh and J.N. Rai, "Design and performance analysis of improved Adaline technique for synchronization and load compensation of grid-tied photovoltaic system," International Transactions on Electrical Energy Systems, Volume 30, Issue 6, March 2020, pp.1-18, doi :10.1002/2050-7038.12388 (Journal Impact Factor: 1.692) , ISSN no. 20507038
- [43] Shikha Gupta, Anjeet Verma, Bhim Singh, Rachana Garg, Alka Singh, "Power Quality Improvement of PV-WPGS Based Grid Interactive Microgrid using MSWL-CLMS Control," *IET Energy Systems Integration*, 2020, Vol. 2 Iss. 4, pp. 362-372 , ISSN no.25168401.
- [44] Shikha Gupta, Anjeet Verma, Bhim Singh, Rachana Garg and Alka Singh, "IZAQ-LMS Based Control of PV-Battery Interfaced Microgrid in Grid-Connected and Autonomous Modes, Vol.13, Iss 17, Dec 2020, pp.3999-4007," IET Power Electronics. (Journal Impact Factor: 2.672) , ISSN No. 17554543.
- [45] Allu Barghav, Alka Singh, "Performance analysis of SLMS based control for PV-STATCOM Using a CHB-MLI" International Journal of Electronics, Taylor and Francis, (e2020), vol.108, Issue 10, 2021, pp.1710-1732, doi.org/10.1080/00207217.2020.1870742, (Journal Impact Factor: 1.004) , ISSN no. 00207217.
- [46] Shikha Gupta, Rachana Garg, and Alka Singh, "Wind/Fuel Cell Hybrid System based on ANFIS-HLMS Control Algorithm for VSC", International Journal of Power and Energy Systems, 2020 (ACTA Pres. Publisher) (ESCI Indexed), DOI: 10.2316/J.2020.203-0192 , ISSN no. 10783466.
- [47] Shikha Gupta, Rachana Garg, and Alka Singh, "Adaptive Control Algorithm to Interface Fuel Cell and Photo Voltaic Energy Sources" International Journal of Power Electronics, 2020. (Inderscience Publisher) (Scopus indexed) , ISSN no. 17566398.
- [48] Shikha Gupta, Rachana Garg, and Alka Singh, "ANFIS Based Control of Multi-Objective Grid-Connected Inverter and Energy Management in Renewable Energy System", Journal of the Institution of Engineers (India): Series B, 101, 1–14, 2020. (IEIB).Springer, ISSN no.22502114

Conference Papers (2020-2024) of Prof. Alka Singh

- [1] Dhruv Bhatia, Alka Singh and Ankita Arora, "PI and Fuzzy Logic Control of Single Phase Grid Connected Inverter Serving Two PV Panels", 2020 IEEE 17th India Council International Conference (INDICON), organized by NSUT, Delhi, Dec 2020

- [2] Shagun Chaudhary and Alka Singh, "Analysis of AI Techniques for Maximum Power Point Tracking Under Partial Shading Conditions", 17th IEEE Indian Council International Conference (INDICON 2020), organized by NSUT, Delhi, Dec 2020
- [3] Ankita Arora and Alka Singh, "Design and Implementation of Grid Sequence Separator Based Control for Single-phase Microgrid", 2020 IEEE 17th India Council International Conference (INDICON), organized by NSUT, Delhi, Dec 2020
- [4] Praveen Bansal and Alka Singh, "Adaptive Notch filter control algorithm for 5-level Distribution Static Compensator" IEEE Int Conference on Smart Technologies for Power, energy and Control (STPEC), IEEE IAS-PELS Sponsored, organized by VNIT, Nagpur, Sep 2020.
- [5] Mayank Kumar and A. Singh, "Two Stage Power Conversion For Grid Connected PV Using Current Control Technique," 2022 Third International Conference on Intelligent Computing Instrumentation and Control Technologies (ICICICT), 2022, pp. 1021-1026, doi: 10.1109/ICICICT54557.2022.9917611.
- [6] Amarendra Pandey and Alka Singh, "Design of a Gagenbuer Polynomial based Low Voltage Ride Through Scheme for three-phase system", (Paper no. 694) , IEEE Conference held as 3rd Global Conference for Advancement in Technology (GCAT), Bangalore, Karnataka, India, 2022
- [7] Sudhanshu Mittal, Alka Singh and Prakash Chittora, "EV Control in G2V and V2G modes using SOGI Controller", (Paper no. 491), 2022 IEEE 3rd Global Conference for Advancement in Technology (GCAT), Bangalore, Karnataka, India, 2022
- [8] Kanchan Bala Rai, Narendra Kumar, Alka Singh, "Performance Analysis of Three-Phase Unified Power Quality Compensator with MAF-SRF control technique under distorted grid condition," IEEE DELCON-2022.
- [9] Kanchan Bala Rai, Narendra Kumar, Alka Singh, "Performance Analysis of UPQC using Mittag Leffler Polynomial based Neural Network Control" 2022 IEEE International Symposium on Sustainable Energy, Signal Processing and Cyber Security"
- [10] S. Chaturvedi and Alka Singh, "Design and Control of a 2kW Electric Vehicle Charger," 2023 *International Conference on Smart Systems for applications in Electrical Sciences (ICSSES)*, Tumakuru, India, 2023, pp. 1-6, doi: 10.1109/ICSSES58299.2023.10201070.
- [11] S. Chaturvedi and Alka Singh, "SOGI-PLL-based control scheme for PFC Boost Converter under Distorted Grid Condition," 2023 *International Conference on Power, Instrumentation, Control and Computing (PICC)*, Thrissur, India, 2023, pp. 1-6, doi: 10.1109/PICC57976.2023.10142483.
- [12] K. Vaity, Harsh and Alka Singh, "Relay Coordination Using Grey Wolf Optimization Method," 2022 1st International Conference on Sustainable

- Technology for Power and Energy Systems (STPES), SRINAGAR, India, 2022, pp. 1-6, doi: 10.1109/STPES54845.2022.10006643.
- [13] Singh Alka, "Application of ANN Techniques to Mitigation of Power Quality Problems," Book Chapter in Applications of Big Data and Artificial Intelligence in Smart Energy Systems: Vol.2 - Energy Planning, Operations, Control and Market Perspectives , River Publishers, 2023, pp.73-96 (IEEE)
- [14] L. D. Oinam and A. Singh, "Design Approach and Performance Analysis of Type I, Type II, and Type III PLL," *2023 7th International Conference on Computer Applications in Electrical Engineering-Recent Advances (CERA)*, Roorkee, India, 2023, pp. 1-6, doi: 10.1109/CERA59325.2023.10455725.
- [15] V. Kumar, A. Singh and P. Chittora, "Control and Analysis of a Grid Following Converter using Adaptive Log Family based SOGI," *2023 7th International Conference on Computer Applications in Electrical Engineering-Recent Advances (CERA)*, Roorkee, India, 2023, pp. 1-6, doi: 10.1109/CERA59325.2023.10455350.
- [16] P. Rai, A. Singh and R. Garg, "Modified LMS/F Algorithm for Power Quality Improvement in Grid Connected PV system," *2023 9th IEEE India International Conference on Power Electronics (IICPE)*, SONIPAT, India, 2023, pp. 1-6, doi: 10.1109/IICPE60303.2023.10475007.
- [17] Prashant Singh, Alka Singh, Ankita Arora, "A comprehensive study on the closed loop performance of a Zeta converter" 2023, 11th National Power Electronics Conference (NPEC),Guwahati, IEEE 2023.
- [18] Prashant Singh, Alka Singh, Ankita Arora, "Dynamic Modelling and PID Control Design for Bidirectional SEPIC/ ZETA DC-DC Converter in Battery Applications" 2024 IEEE 4th Series of CONIT(the international Conference for Intelligent technologies)
- [19] S. Mittal, A. Singh and P. Chittora, "Solar PV Array based Grid-Connected Bi-Directional EV Charger Controlled using NARLMMN Algorithm," *2023 9th IEEE India International Conference on Power Electronics (IICPE)*, SONIPAT, India, 2023, pp. 1-6, doi: 10.1109/IICPE60303.2023.10475089.
- [20] Aryan Kaushik, Aryan Sinha, Aryan Mittal "Analysis and Comprehensive study of Inductor based active cell balancing technique for EV," 3rd IEEE International Conference on Power Electronics, Intelligent control and energy systems, DTU, April 2024 (26-28).
- [21] Mrityunjay, Ankita Arora and Alka Singh, "Design and Performance Evaluation of Various DC-DC Converters for Standalone PV Applications" 3rd IEEE International Conference on Power Electronics, Intelligent control and energy systems, DTU, April 2024 (26-28)
- [22] Prakash Chittora, Alka Singh, Madhusudan Singh et al , "Multifunctional capabilities of self tuned filter in three phase four wire polluted grid distribution system", 3rd IEEE International Conference on Power Electronics, Intelligent control and energy systems, DTU, April 2024 (26-28)

List of Ph.D Students Supervised by Prof. Alka Singh

S.No.	Name of scholar	Year of passing	Title of Thesis
-------	-----------------	-----------------	-----------------

1	Manoj Badoni	Sep 2015	Analysis , Design and Control of DSTATCOM and its Applications
2	Prakash Chittora	Nov 2018	Analysis and Control of Shunt compensators in distribution system
3	Shikha Gupta	2020	Modelling and Analysis of hybrid microgrid system
4.	Neelam Kassarvani	Dec2019	Performance Study of Dynamic Voltage Restorer for mitigation of voltage sags
5.	Hemant Saxena	July 2021	Design, Control and Analysis of grid connected PV system
6.	Ankita Arora	Feb 2023	Design and Development of new controllers for grid tied PV systems
7.	Praveen Bansal	July 2023	Analysis and Control of Multilevel inverter for Power Quality Improvement
8.	Kanchan Bala Rai	April 2024	Design and Control of custom power devices for mitigation of power quality problems
9.	Amarendra Pandey	July 2024	Design, Development and Control of Voltage Source Converters for integration of solar PV