Publications of G. Narayanan

A. Journals

[J1] G.Narayanan and V.T.Ranganathan, "Synchronised PWM strategies based on space vector approach. Part 1: Principles of waveform generation," IEE Proceedings on Electric Power Applications, vol. 146, no. 3, pp. 267-275, May 1999.

[J2] G.Narayanan and V.T.Ranganathan, "Synchronised PWM strategies based on space vector approach. Part 2: Performance assessment and application to V/f drives," IEE Proceedings on Electric Power Applications, vol. 146, no. 3, pp. 276-281, May 1999.

[J3] G.Narayanan and V.T.Ranganathan, "Triangle-comparison approach and space vector approach to pulsewidth modulation in inverter fed drives," Journal of the Indian Institute of Science, vol. 80, pp. 409-427, Sep./Oct. 2000.

[J4] G.Narayanan, S.R.Muralidhara, A.S.Anand and V.Ramanarayanan, "Protection of insulated gate bipolar transistors against short circuit," Journal of Indian Institute of Science, vol. 80, pp. 457-475, Sep./Oct. 2000.

[J5] G.Narayanan and V.T.Ranganathan, "An overmodulation algorithm for space vector modulated inverters and its application to low switching frequency PWM techniques," IEE Proceedings on Electric Power Applications, vol. 148, no. 6, pp. 521-536, Nov 2001.

[J6] G.Narayanan and V.T.Ranganathan, "Two novel synchronised bus-clamping PWM techniques based on space vector approach for high power drives," IEEE Transactions on Power Electronics, vol. 17, no. 1, pp. 84-93, Jan 2002.

[J7] G.Narayanan and V.T.Ranganathan, "Extension of operation of space vector-based low switching frequency PWM strategies using different overmodulation algorithms," IEEE Transactions on Power Electronics, Vol. 17, no. 5, pp. 788-798, Sep 2002.

[J8] G.Narayanan and V.T.Ranganathan, "Analytical evaluation of harmonic distortion in PWM AC drives using the notion of stator flux ripple," IEEE Transactions on Power Electronics, vol. 20, no. 2, pp. 466 – 474, March 2005.

[J9] G. Narayanan, H. Krishnamurthy, Di Zhao and R. Ayyanar, "Advanced bus-clamping PWM techniques based on space vector approach," IEEE Transactions on Power Electronics, vol. 21, no. 4, pp. 974 – 984, July 2006.

[J10] P.Srikant Varma and G.Narayanan, "Space vector PWM as a modified form of sine-triangle PWM for simple analog or digital implementation," IETE Journal of Research, vol. 52, no. 6, pp. 435-449, Nov-Dec 2006.

[J11] Rajesh Ghosh and G. Narayanan, "A simple analog controller for single-phase half-bridge rectifier," IEEE Transactions on Power Electronics, vol. 22, no. 1, pp. 186-198, Jan 2007.

[J12] A.R. Beig, G. Narayanan and V.T. Ranganathan, "Modified SVPWM algorithm for three level VSI with synchronized and symmetrical waveforms," IEEE Transactions on Industrial Electronics, vol. 54, no. 1, pp. 486-494, Feb 2007.

[J13] Rajesh Ghosh and G. Narayanan, "A single-phase boost rectifier system for wide range of load variations," IEEE Transactions on Power Electronics, vol. 22, no. 2, pp. 470-479, March 2007.

[J14] Rajesh Ghosh and G. Narayanan, "Generalized feedforward control of single-phase PWM rectifiers using disturbance observers," IEEE Transactions on Industrial Electronics, vol. 54, no. 2, pp. 984-993, April 2007.

[J15] Rajesh Ghosh and G. Narayanan, "Control of three-phase, four-wire PWM rectifier," IEEE Transactions on Power Electronics, vol. 23, no. 1, pp. 96-106, Jan 2008.

[J16] G. Narayanan, D. Zhao, H. Krishnamurthy, R. Ayyanar and V.T. Ranganathan, "Space vector based hybrid PWM techniques for reduced current ripple," IEEE Transactions on Industrial Electronics, vol. 55, no. 4, pp. 1614-1627, April 2008.

[J17] Rajesh Ghosh and G. Narayanan, "A simple method to improve the dynamic response of single-phase PWM rectifiers," IEEE Transactions on Industrial Electronics, vol. 55, no. 10, pp. 3627 – 3634, Oct 2008.

[J18] J.S. Siva Prasad, Tushar Bhavsar, Rajesh Ghosh and G. Narayanan, "Vector control of three-phase AC/DC front-end converter," Sadhana, vol. 33, no. 5, pp. 591 – 613, Oct 2008.

[J19] Kaushik Basu, J.S. Siva Prasad and G. Narayanan, "Minimization of torque ripple in PWM AC drives," IEEE Transactions on Industrial Electronics, vol. 56, no. 2, pp. 553 – 558, Feb 2009.

[J20] Tushar Bhavsar and G. Narayanan, "Harmonic analysis of advanced bus-clamping PWM techniques," IEEE Transactions on Power Electronics, vol. 24, no. 10, pp. 2347 – 2352, Oct 2009.

[J21] D. Zhao, V.S.S. Pavan Kumar Hari, G. Narayanan and R. Ayyanar, "Space vector based hybrid pulse width modulation techniques for reduced harmonic distortion and switching loss," IEEE Transactions on Power Electronics, vol. 25, no. 3, pp. 760 – 785, March 2010.

[J22] K. Basu, J.S.S. Prasad, G. Narayanan, H. Krishnamurthy and R. Ayyanar, "Reduction of torque ripple in induction motor drives using an advanced hybrid PWM technique," IEEE Transactions on Industrial Electronics, vol. 57, no. 6, pp. 2085 – 2091, June 2010.

[J23] S. Das and G. Narayanan, "Novel switching sequences for a space vector modulated three-level inverter," IEEE Transactions on Industrial Electronics, vol. 59, no. 3, pp. 1477 – 1487, March 2012.

[J24] V.S.S. Pavan Kumar Hari and G. Narayanan, "Space-vector-based hybrid PWM technique to reduce line current distortion in induction motor drives," IET Power Electronics, vol. 5, issue 8, pp. 1463 – 1471, Sep 2012.

[J25] A.C. Binoj Kumar, J.S.S. Prasad and G. Narayanan, "Experimental investigations on the effect of advanced bus-clamping pulsewidth modulation on motor acoustic noise," IEEE Transactions on Industrial Electronics, vol. 60, no. 2, pp. 433 – 439, Feb 2013.

[J26] M.K. Modi, S. Venugopal and G. Narayanan, "Space vector based analysis of overmodulation in triangle-comparison based PWM for voltage source inverter," Sadhana, vol. 38, part 3, pp. 331-358, June 2013.

[J27] J.S.S. Prasad and G. Narayanan, "Apparatus and method for heat-run test on high-power PWM converters with low energy expenditure," Sadhana, vol. 38, part 3, pp. 359-375, June 2013.

[J28] J.S.S. Prasad and G. Narayanan, "Minimization of grid current distortion in parallel-connected converters through carrier interleaving," IEEE Transactions on Industrial Electronics, vol. 61, no. 1, pp. 76-91, Jan 2014.

[J29] J.S.S. Prasad and G. Narayanan, “Minimum switching loss pulse width modulation for reduced power conversion loss in reactive power compensators,” IET Power Electronics, vol. 7, issue 3, pp. 545 - 551, March 2014.

[J30] S. Das and G. Narayanan, “Analytical closed-form expressions corresponding to novel switching sequences for neutral-point-clamped inverters,” IEEE Transactions on Industrial Electronics, vol. 61, no. 9, pp. 4485 – 4497, Sep 2014.

[J31] S. Das, G. Narayanan and M. Pandey, “Space-vector-based hybrid pulsewidth modulation techniques for a three-level inverter,” IEEE Transactions on Power Electronics, vol. 29, no. 9, pp. 4580 – 4591, Sep 2014.

[J32] K.S. Gopalakrishnan and G. Narayanan, “Space vector based modulation scheme for reducing capacitor rms current in three-level diode-clamped inverter,” Elsevier Electric Power Systems Research, vol. 117, pp 1-13, Dec 2014.

[J33] S. Das, A.C. Binoj Kumar and G. Narayanan, “Analytical evaluation of harmonic distortion factor corresponding to generalized advanced bus-clamping pulsewidth modulation,” IET Power Electronics, vol. 7, issue 12, pp. 3072-3082, Dec 2014.

[J34] Manoj Kumar Modi, S. Venugopal and G. Narayanan, “Analysis and comparison of overmodulation algorithms for space vector modulated voltage source inverter,” European Power Electronics Journal, Vol. 24, no. 4, Dec 2014.

[J35] J.S.S. Prasad, R. Ghosh and G. Narayanan, “Common-mode injection PWM for parallel converters,” IEEE Transactions on Industrial Electronics, vol. 62, issue 2, pp. 789-794, Feb 2015.

[J36] A.C. Binoj Kumar, B. Saritha and G. Narayanan, “Acoustic noise characterization of space vector modulated induction motor drives – an experimental approach,” IEEE Transactions on Industrial Electronics, vol. 62, no. 6, pp.3362 – 3371, June 2015.

[J37] K.S. Gopalakrishnan and G. Narayanan, “Harmonic analysis of dc capacitor current in sinusoidal and space-vector modulated neutral-point-clamped-inverters,” Sadhana, vol. 40, issue 5, pp. 1501-1529, August 2015.

[J38] Challa Mohana Krishna, B. Saritha and G. Narayanan, “Computationally efficient models for simulation of non-ideal dc-dc converters operating in continuous and discontinuous conduction modes,” Sadhana, Vol. 40, No. 7, pp. 2045 – 2071, Oct 2015.

[J39] Saikat Subhra Ghosh and G. Narayanan, “Experimental characterisation and performance evaluation of a coaxial current transformer for measurement of IGBT switching current,” IET Science Measurement & Technology, vol. 9, issue 8, pp. 962-972, Nov 2015.

[J40] Anirudh Guha and G. Narayanan, “Small-signal stability analysis of an open-loop induction motor drive including the effect of inverter dead-time,” IEEE Transactions on Industry Application, vol. 52, no. 1, pp. 242 – 253, Jan/Feb 2016.

[J41] P.R. Rakesh and G. Narayanan, “Analysis of sine-triangle and zero-sequence injection modulation schemes for split-phase induction motor drive,” IET Power Electronics, Vol. 9, Issue 2, pp. 344-355, Feb 2016.

[J42] Anirudh Guha and G. Narayanan, “Modelling and analysis of induction motor drive incorporating the effect of inverter dead-time,” Sadhana, Vol. 41, No. 2, pp. 125 – 145, Feb 2016.

[J43] V.S.S. Pavan Kumar Hari and G. Narayanan, "Theoretical and experimental evaluation of pulsating torque produced by induction motor drives operated with advanced bus-clamping pulse width modulation," IEEE Transactions on Industrial Electronics, Vol. 63, No. 3, pp. 1404 – 1413, Mar 2016.

[J44] Avanish Tripathi and G. Narayanan, "Evaluation and minimization of low-order harmonic torque in low-switching-frequency inverter fed induction motor drives," IEEE Transactions on Industry Application, Vol. 52, No. 2, pp. 1477-1488, Mar/Apr 2016.

[J45] V.S.S. Pavan Kumar Hari and G. Narayanan, "Space vector based hybrid PWM technique to reduce peak-to-peak torque ripple in induction motor drives," IEEE Transactions on Industry Application, Vol. 52, No. 2, pp. 1489-1499, Mar/Apr 2016.

[J46] Syed Shahjahan Ahmad and G. Narayanan, "Linearised modelling of switched reluctance motor for closed loop current control," IEEE Transactions on Industry Applications, vol. 52, no. 4, pp. 3146 – 3158, July/Aug 2016.

[J47] A.C. Binoj Kumar and G. Narayanan, "Variable switching frequency PWM technique for induction motor drive to spread acoustic noise spectrum with reduced current ripple," IEEE Transactions on Industry Applications, vol. 52, no. 5, pp. 3927-3938, Sep/Oct 2016.

[J48] A.C. Binoj Kumar, B. Saritha and G. Narayanan, "Experimental comparison of conventional and bus-clamping PWM methods based on electrical and acoustic noise spectra of induction motor drives," IEEE Transactions on Industry Applications, vol. 52, no. 5, pp. 4061-4073, Sep./Oct. 2016.

[J49] Aniket Datta and G. Narayanan, "Measurement of parasitic inductances in the bus-bar assembly of high power voltage source converter," Journal of Institution of Engineers (India): Series B, vol. 97, issue 4, pp 537-547, Dec 2016. **(Awarded Madan Mohan Malviya Prize in 2018.)**

[J50] Avanish Tripathi and G. Narayanan, "Investigations on optimal pulse-width modulation to minimize total harmonic distortion in the line current," IEEE Transactions on Industry Applications, vol. 53, no. 1, pp. 212 – 221, Jan 2017.

[J51] P.R. Rakesh and G. Narayanan, "Investigation on zero-sequence signal injection for improved harmonic performance in split-phase induction motor drives," IEEE Transactions on Industrial Electronics, vol. 64, no. 4, pp. 2732 – 2741, April 2017.

[J52] K.S. Gopalakrishnan, Santosh Janakiraman, Soumitra Das and G. Narayanan, "Analytical evaluation of DC capacitor RMS current and voltage ripple in neutral-point clamped inverters," Sadhana, vol. 42, no. 6, pp. 827-839, June 2017.

[J53] Anirudh Guha, Abhishek Chetty, C. Kumaresan, G. Narayanan and R. Krishnamoorthy, "Theoretical prediction and experimental verification of light-load instability in a 11-kW open-loop induction motor drive," Sadhana, vol. 42, no. 8, pp. 1263-1273, Aug 2017.

[J54] V.S.S. Pavan Kumar Hari, Avanish Tripathi and G. Narayanan, "Experimental determination of mechanical parameters in sensorless vector-controlled induction motor drive," Sadhana, vol. 42, no. 8, pp. 1285-1297, Aug 2017.

[J55] Subhas Chandra Das, G. Narayanan and Arvind Tiwari, "Experimental study on the influence of junction temperature on the relationship between IGBT switching energy loss and device current," Elsevier Microelectronics Reliability, vol. 80, pp 134 – 143, Jan 2018

[J56] Anirudh Guha and G. Narayanan, "Impact of dead-time on inverter input current, DC-link dynamics and light-load instability in rectifier-inverter-fed induction motor drives," IEEE Transactions on Industry Applications, vol. 54, no. 2, pp. 1414 – 1424, Mar/Apr 2018.

[J57] Avanish Tripathi and G. Narayanan, "Torque ripple minimization in neutral-point-clamped three-level inverter fed induction motor drives operated at low-switching-frequency," IEEE Transactions on Industry Applications, vol. 54, no. 3, pp. 2370-2380, May/June 2018.

[J58] Syed Shahjahan Ahmad and G. Narayanan, "Predictive control based constant current injection scheme for characterization of switched reluctance machine," IEEE Transactions on Industry Applications, vol. 54, no. 4, pp. 3383 – 3392, July/Aug 2018.

[J59] Anirudh Guha and G. Narayanan, "Impact of under-compensation and over-compensation of dead-time effect on small-signal stability of induction motor drive," IEEE Transactions on Industry Applications, vol. 54, no. 6, pp. 6027-6041, Nov/Dec 2018.

[J60] Avanish Tripathi and G. Narayanan, "Analytical evaluation and reduction of torque harmonics in induction motor drives operated at low pulse numbers," IEEE Transactions on Industrial Electronics, vol. 66, no. 2, pp. 967 – 976, Feb 2019. 10.1109/TIE.2018.2835383

[J61] Soumitra Das, V.S.S. Pavan Kumar Hari, Arun Kumar and G. Narayanan, "Analysis of generalized continual-clamp and split-clamp PWM schemes for induction motor drive," Sadhana, vol. 44, no. 2, 2019. https://doi.org/10.1007/s12046-018-1031-7

[J62] Kapil Upamanyu and G. Narayanan, "Improved accuracy, modeling and stability analysis of power hardware in loop simulation with open-loop inverter as power amplifier," IEEE Transactions on Industrial Electronics, vol. 67, no. 1, pp. 369-378, Jan 2020.

[J63] Ramu Nair and G. Narayanan, "Stator flux based model reference adaptive observers for sensorless vector control and direct voltage control of doubly-fed induction generator," IEEE Transactions on Industry Application, vol. 56, no. 4, pp. 3776-3789, July-Aug 2020.

[J64] Ramu Nair and G. Narayanan, "Emulation of wind turbine system using vector controlled induction motor drive," IEEE Transactions on Industry Application, vol. 56, no. 4, pp. 4124-4133, July-Aug 2020.

[J65] Kapil Upamanyu, Chitrank Ameta and G. Narayanan, "Simplified input voltage sensorless vector control for PWM rectifiers," IEEE Transactions on Industry Application, vol. 56, no. 4, pp. 4051-4060, July-Aug 2020.

[J66] Syed Shahjahan Ahmad and G. Narayanan, "Modeling of single-pulse operated switched reluctance generator and its verification," IEEE Transactions on Industry Application, vol. 56, no. 5, pp. 4966-4976, Sep-Oct 2020.

[J67] Chetan Urabinahatti, Syed Shahjahan Ahmad and G. Narayanan, "Magnetic characterization of ferromagnetic alloys for high-speed electric machines," IEEE Transactions on Industry Application, vol. 56, no. 6, pp. 6436-6447, Nov-Dec 2020.

[J68] Syed Shahjahan Ahmad and G. Narayanan, "Experimental investigations on flux linkage characteristics and stator-side modeling of a solid-rotor switched reluctance machine," IEEE Transactions on Industrial Electronics, vol. 67, no. 12, pp. 10180-10190, Dec 2020.

[J69] Syed Shahjahan Ahmad and G. Narayanan, "Evaluation of DC-link capacitor RMS current in switched reluctance motor drive," IEEE Transactions on Industry Application, vol. 57, no. 2, pp. 1459–1471, Mar-Apr 2021.

[J70] Sakshi Narchail, Syed Shahjahan Ahmad, Shreya Srivatsa, Thirumalasetty Mouli, Pramod Kumar and G. Narayanan, "Experimental vibration studies on a solid-rotor switched reluctance machine," IEEE Transactions on Industry Applications, vol. 57, no. 5, pp. 4852-4863, Sep/Oct 2021.

[J71] Kamisetti N V Prasad and G. Narayanan, "Electro-magnetic bearings with power electronic control for high-speed rotating machines: review, analysis and design example," IEEE Transactions on Industry Applications, vol. 57, no. 5, pp. 4946-4975, Sep/Oct 2021.

[J72] Sagnik Kumar, R. Muralidharan and G.Narayanan, "Hall-effect sensors based on AlGaN/GaN hetero-junctions on Si Substrates for wide temperature range," IET Circuits, Devices and Systems, vol. 15, issue 8, pp. 772-786, Nov 2021.

[J73] Syed Shahjahan Ahmad, Chetan Urabinahatti, Kamisetti N V Prasad and G. Narayanan, "High-switching-frequency SiC power converter for high-speed switched reluctance machine," IEEE Transactions on Industry Applications, vol. 57, no. 6, pp. 6069 – 6082, Nov/Dec 2021.

[J74] Thirumalasetty Mouli and G. Narayanan, "Magnetic structure based improvement of output torque of switched reluctance machine: A review," IETE Technical Review, 40:2, pp. 234-251, June 2022, DOI: 10.1080/02564602.2022.2086930

[J75] Lalgy Gopi and G. Narayanan, "Per-phase analysis and efficient implementation of a 24-sector discontinuous PWM for split phase induction motor drives," IEEE Transactions on Industry Applications, vol. 59, no. 1, pp. 897 – 909, Jan/Feb 2023. doi: 10.1109/TIA.2022.3215136.

[J76] Anupam Verma, Syed Shahjahan Ahmad and G. Narayanan, "Analytical prediction of static flux-linkage characteristics of switched reluctance machine," IEEE Transactions on Industry Applications, vol. 59, no. 5, pp. 5886 – 5899, Sep/Oct 2023.

[J77] Lalgy Gopi and G. Narayanan, "Advanced 24-Sector bus-clamping PWM techniques for improved performance of split-phase induction motor drives," IEEE Transactions on Industry Applications, vol. 59, no. 6, pp. 6766 – 6779, Nov/Dec 2023.

[J78] Subhas Chandra Das and G. Narayanan, "Thermo-sensitive electrical parameters of high-power IGBTs based on gate-emitter voltage measurement during switching delay intervals," Elsevier Microelectronics Reliability, vol. 151, 115258, Dec 2023.

[J79] Anupam Verma, Syed Shahjahan Ahmad and G. Narayanan, "Optimal control of single-pulse-operated switched reluctance generator to minimize RMS phase and RMS dc-bus current," IEEE Transactions on Industry Applications, vol. 60, no. 1, pp. 507-519, Jan/Feb 2024.

[J80] Syed Shahjahan Ahmad, Thirumalasetty Mouli and G. Narayanan, "Predictive control of switched reluctance machine for accurate current tracking to enhance torque performance," IEEE Transactions on Industry Applications, vol. 60, no. 1, pp. 1837-1848, Jan/Feb 2024.

[J81] Aditya Raj, Syed Shahjahan Ahmad and G. Narayanan, "Improved direct-coupled high-bandwidth voltage amplifier for B-H characterization of magnetic materials," IEEE Transactions on Industry Applications, IEEE Transactions on Industry Applications, vol. 60, no. 3, pp. 4213-4228, May/June 2024.

[J82] Thirumalasetty Mouli and G. Narayanan, "Influence of stator winding reconnection and bipolar excitation on the performance characteristics of solid-rotor switched reluctance machine," IEEE Transactions on Industry Applications, vol. 60, no. 3, pp. 3773–3789, May/June 2024.

[J83] Thirumalasetty Mouli and G. Narayanan, “PWM-based predictive direct torque control of switched reluctance machine for accurate torque tracking with minimization of phase RMS currents,” vol. 60, no. 5, pp. 6899-6912, Sep/Oct 2024.

[J84] Thirumalasetty Mouli and G. Narayanan, “High-performance torque controller for switched reluctance machine,” IEEE Transactions on Industry Applications, vol. 60, no. 5, pp. 6923-6937, Sep/Oct 2024.

[J85] Kamisetti N V Prasad, G.R. Jayanth and G. Narayanan, “Modelling and control of power-converter-fed electromagnetic bearing,” IEEE Transactions on Industry Applications, vol. 61, no. 1, pp. 181-195, Jan/Feb 2025.

[J86] Anupam Verma and G. Narayanan, “Predictive control of output-current in a single-pulse-operated switched reluctance generator,” IEEE Transactions on Industrial Electronics, vol. 72, no. 4, pp. 3414-3424, April 2025.

[J87] Kamisetti N V Prasad and G. Narayanan, “Electromagnetic axial bearing with reduced thrust-disc diameter for high-speed machines,” IEEE Transactions on Industrial Electronics, pp. 4515-4525, vol. 72, no. 5, May 2025.

[J88] Thirumalasetty Mouli, Syed Shahjahan Ahmad, Anupam Verma, Vijay Biradar, G. Narayanan and Pramod Kumar, “Experimental comparison of solid-rotor and slitted-rotor switched reluctance machine,” IEEE Transaction on Industry Applications, vol. 61, no. 5, pp. 6891-6905, Sept.-Oct. 2025.

[J89] Kamisetti N V Prasad, Aditya Raj and G. Narayanan, “Current tracking performance of an SiC power amplifier for control of electromagnetic bearing with good disturbance rejection,” IEEE Transaction on Industry Applications, vol. 62, no. 1, pp. 1065-1079, Jan.-Feb. 2026, doi: 10.1109/TIA.2025.3590313.

[J90] S. Das and G. Narayanan, "Analytical estimation of effective air-gap and magnetization curve of core material in a switched reluctance machine from terminal electrical measurements," IEEE Transactions on Industry Applications, doi: 10.1109/TIA.2025.3645028. Early Access.

[J91] Ashutosh Patel, Kamisetti N V Prasad, Thirumalasetty Mouli, Pramod Kumar and G. Narayanan, “Structural analysis of slitted rotor for 10,000-rpm 5-Nm switched reluctance machine,” IEEE Transactions on Industry Applications, Page 1-14, 2025. DOI: 10.1109/TIA.2025.3645001. Early Access.

B. Conferences

[C1] G. Narayanan, Rajib Datta and V.Ramanarayanan, "A High Performance Isolated AC/DC Voltage/Current Transducer," Proceedings of the International Conference on Instrumentation, ICI-1996, Bangalore, India, pp. 343-347, Aug. 1996.

[C2] G. Narayanan and V.T. Ranganathan, "Synchronised bus-clamping PWM strategies based on space vector approach for modulation upto six-step mode," 2nd International Conf. on Power Electronics, Drives and Energy Systems for Industrial Growth, PEDES '98, Perth, Australia, pp. 996-1001, Nov.-Dec. 1998.

[C3] G. Narayanan and V.T. Ranganathan, "Bus-clamped PWM techniques for AC drives - Application considerations," Proceedings of PCIM '2000 Power Electronics Conference, Boston, USA, Oct. 2000.

[C4] A.R. Beig, G. Narayanan and V.T. Ranganathan, "Space vector based synchronized PWM algorithm for three level voltage source inverters: Principles and application to V/f drives," Proceedings of IEEE-IECON '2002, Sevilla, Spain, Nov. 2002.

[C5] H. Krishnamurthy, G. Narayanan, R. Ayyanar and V.T. Ranganathan, "Design of space vector-based hybrid PWM techniques for reduced current ripple," Proceedings of the IEEE Applied Power Electronics Conference and Exposition, APEC '2003, Miami, Florida, USA, pp. 583-588, February 2003.

[C6] T.G. Subhash Joshi, A.S. Haneesh, G. Narayanan and V.T. Ranganathan, "A computationally efficient PWM algorithm for multilevel converters," Proceedings of the National Power Electronics Conference NPEC 2003, pp. 106-111, Mumbai, India, October 2003.

[C7] Di Zhao, G. Narayanan and R. Ayyanar, "Switching loss characteristics of sequences involving active state division in space vector based PWM," Proceedings of the IEEE Applied Power Electronics Conference and Exposition, APEC '2004, Anaheim, California, USA, pp. 479-485, February 2004.

[C8] Rajesh Ghosh and G. Narayanan, "An input voltage sensorless average current control technique for high-power-factor boost rectifiers operated in the discontinuous conduction mode," Proc. IEEE – APEC 2005 Conference, Austin, Texas, USA.

[C9] Rajesh Ghosh and G. Narayanan, "A simple analog controller for single phase half bridge rectifier and its application to transformerless UPS," IEEE Power Electronics Specialists Conference, PESC '05, Recife, Brazil, June 2005.

[C10] Rajesh Ghosh and G. Narayanan, "Design and implementation of a reduced order observer for inductor current estimation in a buck type rectifier," National Power Electronics Conference, NPEC 2005, Kharagpur, India, Dec 2005.

[C11] S. Venugopal and G. Narayanan, "Design of FPGA based digital platform for control of power electronics systems," National Power Electronics Conference, NPEC 2005, Kharagpur, India, Dec 2005.

[C12] D. Banerjee, Rajesh Ghosh, V.T. Ranganathan and G. Narayanan, "Comparison of various sine-triangle PWM techniques for three level voltage source inverters in space vector domain," National Power Electronics Conference, NPEC 2005, Kharagpur, India, Dec 2005.

[C13] S. Venugopal and G. Narayanan, "An overmodulation scheme for vector controlled induction motor drives," presented at IEEE - PEDES Conference, New Delhi, Dec 2006.

[C14] J.S. Siva Prasad, T.V. Bhavsar, R. Ghosh and G. Narayanan, "Vector control of three-phase ac-dc front-end converter," National Power Electronics Conference, NPEC-2007, Bangalore, Dec 17-19, 2007.

[C15] V.S.S. Pavan Kumar Hari and G. Narayanan, "Comparative evaluation of space vector based pulse width modulation techniques in terms of harmonic distortion and switching loss," Proceedings MCDES conference, Indian Institute of Science, Bangalore, May 2008.

[C16] J.S.S. Prasad and G. Narayanan, "Control of parallel-connected converters for load testing of high power PWM converters," National Power Electronics Conference, NPEC-2010, Roorkee, June 2010.

[C17] Manoj Kumar Modi, S. Venugopal and G. Narayanan, "Analysis of overmodulation in sine-triangle PWM from a space vector perspective," National Power Electronics Conference, NPEC-2010, Roorkee, June 2010.

[C18] M. Raghava Krishna and G. Narayanan, "A dead-time compensation circuit for voltage source inverters," National Power Electronics Conference, NPEC-2010, Roorkee, June 2010.

[C19] Soumitra Das and G. Narayanan, "Novel switching sequences for a space vector modulated three-level inverter," National Power Electronics Conference, NPEC-2010, Roorkee, June 2010.

[C20] A.C. Binoj Kumar and G. Narayanan, "A variable switching frequency PWM technique for inverter-fed induction motor to achieve spread spectrum," National Power Electronics Conference, NPEC-2010, Roorkee, June 2010.

[C21] Lalit Patnaik, G. Narayanan and L. Umanand, "An investigation into even harmonic injection in pole voltages of a single-phase inverter," National Power Electronics Conference, NPEC-2010, Roorkee, June 2010.

[C22] J.S.S. Prasad and G. Narayanan, "Reduction of grid current distortion in parallel-connected line-side converters using carrier interleaving," National Power Electronics Conference, NPEC-2011, Bengal Engg Science Univ, Dec 2011.

[C23] A.C. Binoj Kumar and G. Narayanan, "A low-cost system for measurement and spectral analysis of motor acoustic noise," National Power Electronics Conference, NPEC-2011, Bengal Engg Science Univ, Dec 2011.

[C24] Arjun Yadav and G. Narayanan, "A low-cost digital controller for power electronic applications," National Power Electronics Conference, NPEC-2011, Bengal Engg Science Univ, Dec 2011.

[C25] Soumitra Das and G. Narayanan, "Space vector based analysis and comparison of sinusoidal pulsewidth modulation schemes for a three-level inverter," National Power Electronics Conference, NPEC-2011, Bengal Engg Science Univ, Dec 2011.

[C26] G.Narayanan, U.J. Shenoy and P.V. Suryanarayana, "A course on electronic circuits laboratory for a masters' programme in electrical engineering," National Power Electronics Conference, NPEC-2011, Bengal Engg Science Univ, Dec 2011.

[C27] V.S.S. Pavan Kumar Hari and G. Narayanan, "Study on rotor current waveforms in an inverter-fed induction motor drive during overmodulation," Proc. EE Centenary Conference, IISc, Bangalore, Dec 2011.

[C28] K.S. Gopalakrishnan, Soumitra Das and G. Narayanan, "Analytical expression for rms dc link capacitor current in a three-level inverter," Proc. EE Centenary Conference, IISc, Bangalore, Dec 2011.

[C29] K.S. Amit Kumar and G. Narayanan, "Simplified implementation of space vector PWM strategies for a three-level inverter," IEEE International Conference on Industrial and Information Systems, ICIIS 2012, IIT Madras, Chennai, Aug 2012.

[C30] Ch Rajendra Prasad and G. Narayanan, "Proportional resonant controller based circulating power setup for thermal testing of multilevel inverter," IEEE International Conference on Industrial and Information Systems, ICIIS 2012, IIT Madras, Chennai, Aug 2012.

[C31] Vikash Kumar, Srikanth Reddy and G. Narayanan, "Measurement of IGBT switching characteristics and loss using coaxial current transformer," IEEE India International Conference on Power Electronics, IICPE 2012, New Delhi, Dec 2012.

[C32] Subhas Chandra Das, G. Narayanan, Arvind Tiwari and Ajit Kumar, "Experimental investigation on switching characteristics of IGBTs for traction application," IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES 2012), Bangalore, Dec 2012.

[C33] V.S.S. Pavan Kumar Hari, G. Narayanan, Rex Joseph and L. Umanand, "Analysis of the modulation process in advanced bus-clamping PWM techniques," 39th Annual Conference of IEEE Industrial Electronics Society, (IEEE IECON 2013), Vienna, Austria, Nov 2013.

[C34] Anirudh Guha and G. Narayanan, "Average modelling of a voltage source inverter with dead-time in a synchronous reference frame," IEEE PES Asia Innovative Smart Grid Technologies Conference, Bangalore, Nov 2013.

[C35] Subhas Chandra Das, G. Narayanan, Arvind Tiwari and Ajit Kumar, "Experimental study on IGBT voltage and current stresses during switching transitions," IEEE PES Asia Innovative Smart Grid Technologies Conference, Bangalore, Nov 2013.

[C36] Anirudh Guha, Avanish Tripathi and G. Narayanan, "Experimental study on dead-time induced oscillations in a 100-kW open-loop induction motor drive," National Power Electronics Conference, NPEC-2013, IIT Kanpur, Dec 2013.

[C37] Avanish Tripathi and G. Narayanan, "On-line estimation of fundamental and ripple components of line currents in a voltage-source inverter operated at low switching frequency," National Power Electronics Conference, NPEC-2013, IIT Kanpur, Dec 2013.

[C38] K.S. Gopalakrishnan and G. Narayanan, "Harmonic analysis of dc-link capacitor current in a sinusoidally modulated neutral-point-clamped inverter," National Power Electronics Conference, NPEC-2013, IIT Kanpur, Dec 2013.

[C39] J.S. Siva Prasad and G. Narayanan, "Modeling and control of back-to-back connected PWM converters," National Power Electronics Conference, NPEC-2013, IIT Kanpur, Dec 2013.

[C40] V.S.S. Pavan Kumar Hari and G. Narayanan, "A quick simulation tool for induction motor drives controlled using advanced space-vector-based PWM techniques," National Power Electronics Conference, NPEC-2013, IIT Kanpur, Dec 2013.

[C41] P. Sidharthan and G. Narayanan, "Reduction of tab-to-chassis capacitance of a power MOSFET and conducted emission through proper mounting arrangement," National Power Electronics Conference, NPEC-2013, IIT Kanpur, Dec 2013.

[C42] Saikat Subhra Ghosh, Rangesh Babu and G. Narayanan, "Experimental study on switching characteristics of 50A/1200V and 300A/1200V IGBTs," National Power Electronics Conference, NPEC-2013, IIT Kanpur, Dec 2013.

[C43] Tapas Roy, V.S.S. Pavan Kumar Hari and G. Narayanan, "Study on the effect of dead time and its compensation for bus-clamping PWM techniques," National Power Electronics Conference, NPEC-2013, IIT Kanpur, Dec 2013.

[C44] B.Saritha, V. Pandey and G. Narayanan, "Computationally efficient model for simulation of boost converter," National Power Electronics Conference, NPEC-2013, IIT Kanpur, Dec 2013.

[C45] Avanish Tripathi and G. Narayanan, "Optimal pulse-width modulation of voltage-source inverter fed motor drives with relaxation of quarter wave symmetry condition," IEEE International Conference on Electronics, Computing and Communication Technologies, IEEE CONECCT 2014, Bangalore, Jan 2014.

[C46] C. Rangesh Babu and G. Narayanan, "Study on gate characteristics and drive circuit for 300A/1200V insulated gate bipolar transistors," IEEE International Conference on Electronics, Computing and Communication Technologies, IEEE CONECCT 2014, Bangalore, Jan 2014.

[C47] Janamejaya Channegowda, B. Saritha and G. Narayanan, "Comparative evaluation of switching and average models of a dc-dc boost converter for real-time simulation," IEEE International Conference on Electronics, Computing and Communication Technologies, IEEE CONECCT 2014, Bangalore, Jan 2014.

[C48] Anirudh Guha, Aniket Datta, C. Rangesh Babu and G. Narayanan, "Experimental investigation on switching characteristics of high-current insulated gate bipolar transistors at low currents," IEEE International Conference on Electrical Energy Systems, Chennai, Jan 2014.

[C49] Subhas Chandra Das, G. Narayanan and Arvind Tiwari, "Experimental study on switching characteristics of an inverter leg consisting of IGBTs of dissimilar makes," IEEE International Conference on Electrical Energy Systems, Chennai, Jan 2014.

[C50] V.S.S. Pavan Kumar Hari and G. Narayanan, "Space-vector-based hybrid PWM technique to reduce peak-to-peak torque ripple in induction motor drives," IEEE Applied Power Electronics Conference and Exposition 2014 (IEEE APEC 2014), Fortworth, Texas, March 2014.

[C51] Avanish Tripathi and G. Narayanan, "High-performance off-line pulse width modulation without quarter wave symmetry for voltage-source inverter," IEEE International Conference on Advances in Electronics, Computers and Communication (ICAECC), Bangalore, Oct 2014.

[C52] Avanish Tripathi and G. Narayanan, "Investigations on optimal pulse-width modulation to minimize total harmonic distortion in the line current," IEEE India International Conference on Power Electronics, IICPE 2014, Kurukshetra, Dec 2014.

[C53] Anirban Pal and G. Narayanan, "Comparative study on enhancement mode gallium nitride (e-GAN) FET and silicon MOSFET devices," IEEE India International Conference on Power Electronics, IICPE 2014, Kurukshetra, Dec 2014.

[C54] Anirudh Guha and G. Narayanan, "An improved dead-time compensation scheme for voltage source inverters considering the device switching transition times," IEEE India International Conference on Power Electronics, IICPE 2014, Kurukshetra, Dec 2014.

[C55] A.C. Binoj Kumar, B. Saritha and G. Narayanan, "Comparative evaluation of conventional and bus-clamping PWM methods based on electrical and acoustic noise spectra," IEEE India International Conference on Power Electronics, IICPE 2014, Kurukshetra, Dec 2014.

[C56] S. Ritika, Arjun Yadav and G. Narayanan, "Real time simulation of photovoltaic array on miniature full spectrum simulator," IEEE India International Conference on Power Electronics, IICPE 2014, Kurukshetra, Dec 2014.

[C57] Syed Shahjahan Ahmad and G. Narayanan, "Linearised modelling of switched reluctance motor for closed loop current control," IEEE India International Conference on Power Electronics, IICPE 2014, Kurukshetra, Dec 2014.

[C58] Subhas Chandra Das, G. Narayanan and Arvind Tiwari, "Variation of IGBT switching loss with device current: an experimental investigation," IEEE India International Conference on Power Electronics, IICPE 2014, Kurukshetra, Dec 2014.

[C59] Avanish Tripathi and G. Narayanan, "Evaluation and minimization of low-order harmonic torque in low-switching-frequency inverter fed induction motor drives," IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES 2014), Mumbai, Dec 2014.

[C60] Anirudh Guha and G. Narayanan,, "Small-signal stability analysis of an open-loop induction motor drive including the effect of inverter dead-time," IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES 2014), Mumbai, Dec 2014.

[C61] Aniket Datta, Anirudh Guha and G. Narayanan, "An active gate driver for insulated gate bipolar transistors to eliminate dead-time induced distortions in inverter output," IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES 2014), Mumbai, Dec 2014.

[C62] A.C. Binoj Kumar and G. Narayanan, "Variable switching frequency PWM technique for induction motor drive to spread acoustic noise spectrum with reduced current ripple," IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES 2014), Mumbai, Dec 2014.

[C63] Manoj Kumar Modi and G. Narayanan, "Improved single-zone overmodulation algorithm for space vector modulated inverters," IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES 2014), Mumbai, Dec 2014.

[C64] Subhas Chandra Das, G. Narayanan and Arvind Tiwari, "Experimental study on the dependence of IGBT switching energy loss on dc link voltage," IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES 2014), Mumbai, Dec 2014.

[C65] Anirudh Guha and G. Narayanan, "Inductance-emulation-based active damping of dead-time-induced oscillations in a 100-kW induction motor drive," International Transportation Electrification Conf India (ITEC India), Chennai, Aug 2015.

[C66] Anirudh Guha, Abhishek Chetty, C. Kumaresan, G. Narayanan and R. Krishnamoorthy, "Theoretical prediction and experimental verification of light-load instability in a 11-kW open-loop induction motor drive," National Power Electronics Conference, NPEC-2015, IIT Bombay, Mumbai, Dec 2015.

[C67] V.S.S. Pavan Kumar Hari, Avanish Tripathi and G. Narayanan, "Experimental determination of mechanical parameters in sensorless vector-controlled induction motor drive," National Power Electronics Conference, NPEC-2015, IIT Bombay, Mumbai, Dec 2015.

[C68] Anirudh Guha, Abhishek Chetty, Ekta K. Panda, C. Kumaresan, G. Narayanan and R. Krishnamoorthy, "Experimental case studies on dead-time induced oscillation and its mitigation in 5-hp and 10-hp induction motor drives," IEEE International Conference on Electrical Energy Systems, Chennai, Feb 2016.

[C69] Anirudh Guha and G. Narayanan, "Impact of dead-time on inverter input current, dc-link dynamics and light-load instability in rectifier-inverter-fed induction motor drives," Proc. International Symposium on Power Electronics, Electrical Drives, Automation and Motion, SPEEDAM, Capri, Italy, June 2016.

[C70] Avanish Tripathi and G. Narayanan, "Torque ripple minimization in neutral-point-clamped three-level inverter fed induction motor drives operated at low-switching-frequency," Proc. International Symposium on Power Electronics, Electrical Drives, Automation and Motion, SPEEDAM, Capri, Italy, June 2016.

[C71] Avanish Tripathi and G. Narayanan, "Influence of three-phase symmetry on pulsating torque in induction motor drives," IEEE India International Conference on Power Electronics, IICPE 2016, Patiala, Nov 2016.

[C72] Kapil Upamanyu, D. Venkataramanan, Anil K. Adapa and G. Narayanan, "Experimental study on the influence of dead-time on IGBT turn-off characteristics in an inverter leg at high and low currents," IEEE India International Conference on Power Electronics, IICPE 2016, Patiala, Nov 2016.

[C73] Eshan Dhar, Syed Shahjahan Ahmad, Pramod Kumar and G. Narayanan, "Rotodynamic Study of a High Speed Switched Reluctance Generator," IEEE India International Conference on Power Electronics, IICPE 2016, Patiala, Nov 2016.

[C74] Syed Shahjahan Ahmad, Eshan Dhar, Pramod Kumar and G. Narayanan, "Electromagnetic Design of a 5-kW, 10,000-rpm Switched Reluctance Machine," IEEE India International Conference on Power Electronics, IICPE 2016, Patiala, Nov 2016.

[C75] Subhas Chandra Das, G. Narayanan and Arvind Tiwari, "Reverse Recovery Characteristics of the IGBT Anti-Parallel Diode with Variation in Operating Conditions: An Experimental Study," IEEE India International Conference on Power Electronics, IICPE 2016, Patiala, Nov 2016.

[C76] Kapil Upamanyu, Mandela Chaitanya, G, Narayanan and Gurunath Gurrala, "Current controlled voltage source inverter based amplifier for power hardware in loop simulation using miniature full spectrum simulator," Power India International Conference, PIICON 2016, Nov 2016.

[C77] Mandela Chaitanya, Gurunath Gurrala and G. Narayanan, "Real-Time Simulation of an Islanded Microgrid Using Educational Miniature Full Spectrum Simulator," 19th National Power Systems Conference, NPSC 2016, Bhubaneswar, Dec 2016.

[C78] Anirudh Guha and G. Narayanan, "Impact of under-compensation and over-compensation of dead-time effect on small-signal stability of induction motor drive," IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES 2016), Thiruvananthapuram, Dec 2016.

[C79] Avanish Tripathi, V.S.S. Pavan Kumar Hari and G. Narayanan "Closed-loop rotor flux estimation in vector controlled induction motor drives operated at low switching frequencies," IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES 2016), Thiruvananthapuram, Dec 2016.

[C80] Avanish Tripathi and G. Narayanan, "Optimal PWM for minimization of current harmonic distortion in three-level inverter fed induction motor drives," IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES 2016), Thiruvananthapuram, Dec 2016.

[C81] Syed Shahjahan Ahmad and G. Narayanan, "A simplified flux linkage characteristics model of switched reluctance machine," IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES 2016), Thiruvananthapuram, Dec 2016.

[C82] Syed Shahjahan Ahmad and G. Narayanan, "Predictive control based constant current injection scheme for characterization of switched reluctance machine," IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES 2016), Thiruvananthapuram, Dec 2016.

[C83] Subhas Chandra Das, G. Narayanan and Arvind Tiwari, "Variation of switching sub-intervals of IGBT with device current and junction temperature: an experimental study," IEEE INDICON 2016, Bengaluru, Dec 2016.

[C84] Abhishek Kar, Syed Shahjahan Ahmad, G. Narayanan and Mainak Sengupta, "Design, performance evaluation, fabrication and testing of a SiC MOSFET gate driver," IEEE SPICES, Kollam, Aug 2017.

[C85] Chetan Urabinahatti, Syed Shahjahan Ahmad and G. Narayanan, "Device loss estimation and heat-sink design for SiC based power converter feeding a switched reluctance machine," IEEE SPICES, Kollam, Aug 2017.

[C86] Ashutosh Badal, G. Narayanan and R. Muralidharan, "Evaluation of on-state resistance in gallium nitride based power electronic switches," IEEE SPICES, Kollam, Aug 2017.

[C87] P. Sidharthan, G. Narayanan and S.K. Datta, "Experimental investigation on reverse recovery characteristics of high-performance high-frequency diodes," IEEE SPICES, Kollam, Aug 2017.

[C88] R. Ramu Nair and G. Narayanan, "Modified model reference adaptive observer for rotor speed and position estimation in wound rotor induction machine," IEEE APPEEC, Bengaluru, 2017.

[C89] Shashank Jain, Chitrank Ameta and G. Narayanan, "Real-time simulation of IEEE 3-generator 9-bus system on miniature full-spectrum simulator," National Power Electronics Conference (NPEC), Pune, Dec 2017.

[C90] Syed Shahjahan Ahmad and G. Narayanan, "Double pulse test based switching characterization of SiC MOSFET," National Power Electronics Conference (NPEC), Pune, Dec 2017.

[C91] J.S.S. Prasad, K.N.V. Prasad and G. Narayanan, "Timer based digital implementation of advanced bus-clamping PWM techniques," IEEE GUCON, Noida, Sep 2018.

[C92] Shashank Jain, Siri Subrahmanyam Vadlamani and G. Narayanan, "Controller hardware-in-loop simulation of a multi-machine system using an educational real-time simulator," National Power Systems Conference, Dec 2018.

[C93] J.S.S. Prasad, K.N.V. Prasad and G. Narayanan, "Device loss and thermal characteristics of high power PWM converters," IEEE India International Power Electronics Conference, Jaipur, Dec 2018.

[C94] Sakshi Narchail, Chetan Urabinahatti, Shreyas Srivatsa, Ashutosh Patel, Syed Shahjahan Ahmad, Pramod Kumar and G Narayanan, "Experimental investigations on a high-speed rotor for a switched reluctance machine," IEEE India International Power Electronics Conference, Jaipur, Dec 2018.

[C95] Chetan Urabinahatti, Syed Shahjahan Ahmad and G. Narayanan, "Magnetic characterization of ferromagnetic alloys for high speed electric machines," IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES 2018), Chennai, Dec 2018.

[C96] R. Ramu Nair and G. Narayanan, "Stator flux based model reference adaptive observers for rotor position and speed estimation in doubly-fed induction machines," IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES 2018), Chennai, Dec 2018.

[C97] R. Ramu Nair and G. Narayanan, “Emulation of wind turbine system using vector controlled induction motor drive,” IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES 2018), Chennai, Dec 2018.

[C98] Kapil Upamanyu, Chitrank Ameta and G Narayanan, “Simplified input voltage sensorless vector control for PWM Rectifiers,” IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES 2018), Chennai, Dec 2018.

[C99] Shashank Jain, Siri Subrahmanyam Vadlamani and G. Narayanan, “Real-time simulation of IEEE 10-generator 39-bus system in full spectrum simulator with power system stabilizer,” IEEE Conference on Sustainable Energy Technologies, Bhubaneswar, Feb 2019.

[C100] R. Ramu Nair and G. Narayanan, “Unified grid integration algorithm for synchronization and power control of doubly-fed induction generator,” Proc. IEEE Applied Power Electronics Conference and Exposition, Anaheim, CA, USA, Mar 2019, pp. 1829-1834.

[C101] Syed Shahjahan Ahmad and G. Narayanan, “Modeling of single-pulse operated switched reluctance generator and its verification,” Proc. 10th International Conference on Power Electronics and ECCE Asia (ICPE – ECCE Asia), Busan, Korea, May 2019.

[C102] Syed Shahjahan Ahmad and G. Narayanan, “Evaluation of DC-link capacitor RMS current in switched reluctance motor drive,” Proc. 10th International Conference on Power Electronics and ECCE Asia (ICPE – ECCE Asia), Busan, Korea, May 2019.

[C103] K.N.V. Prasad and G. Narayanan, “Electro-magnetic bearings with power electronic control for high-speed rotating machines: a review,” National Power Electronics Conference (NPEC), NIT Trichy, Dec 2019.

[C104] Chetan Urabinahatti, Syed Shahjahan Ahmad and G. Narayanan, “Experimental studies on the effect of thermal interface material and mounting technique on the thermal resistance of device cooling arrangement,” National Power Electronics Conference (NPEC), NIT Trichy, Dec 2019.

[C105] Sakshi Narchail, Syed Shahjahan Ahmad, Shreya Srivatsa, Pramod Kumar and G. Narayanan, “Experimental vibration studies on a solid-rotor switched reluctance machine,” National Power Electronics Conference (NPEC), NIT Trichy, Dec 2019.

[C106] J.S.S. Prasad, K.N.V. Prasad and G. Narayanan, “Experimental comparison of power conversion loss with different PWM strategies for STATCOM application,” IEEE International Conference on Power Electronics, Smart Grid and Renewable Energy, Kochi, Jan 2020.

[C107] Kapil Upamanyu and G. Narayanan, “Simplified grid emulator for testing grid-connected power electronic converters,” IEEE International Conference on Power Electronics, Smart Grid and Renewable Energy, Kochi, Jan 2020.

[C108] Syed Shahjahan Ahmad, Chetan Urabinahatti and G. Narayanan, “20 kW, 50 kHz SiC Power Converter for High Speed Switched Reluctance Machine,” IEEE Power India International Conference, Feb 2020.

[C109] Sagnik Kumar, G.Narayanan and R. Muralidharan, “Current spinning and signal conditioning circuit for high-performance magnetic field sensing,” IEEE Power India International Conference, Feb 2020.

[C110] Kapil Upamanyu and G. Narayanan, “Power electronic based emulation of synchronous generator including stator transients for analyses involving unbalanced and non-linear loads,” IEEE International Conference on Power System Technology (POWERCON), Sep 2020.

[C111] Lalgy Gopi and G. Narayanan, "Per-phase analysis and efficient implementation of a 24-sector discontinuous PWM for split phase induction motor drives," IEEE Workshop on Electric Machines Design, Control and Diagnosis (WEMDCD), Modena, Italy, April 2021.

[C112] Ravi Kumar Ranjan, Kapil Upamanyu and G. Narayanan, "Real time simulation of wind turbine driven grid-connected induction generator on DSP platform," IEEE International Power and Renewable Energy Conference (IPRECON), Karunagapally, Kerala, India, Sep 2021.

[C113] Kamisetti N V Prasad, Ashutosh Patel, Vijay Biradar, Syed Shahjahan Ahmad, Pramod Kumar and G. Narayanan, "Bearing selection for high-speed electrical machine," National Power Electronics Conference (NPEC), IIT Bhubaneswar, Dec 2021.

[C114] Anupam Verma, Syed Shahjahan Ahmad and G. Narayanan, "Optimal switching angles for single-pulse-operated switched reluctance generator," National Power Electronics Conference (NPEC), IIT Bhubaneswar, Dec 2021.

[C115] Thirumalasetty Mouli and G. Narayanan, "Theoretical and experimental investigations on a solid-rotor switched reluctance motor to enhance torque output through stator winding reconnection," National Power Electronics Conference (NPEC), IIT Bhubaneswar, Dec 2021.

[C116] Syed Shahjahan Ahmad, Aditya Raj and G. Narayanan, "Low-cost multistage direct-coupled linear power amplifier for characterization of magnetic cores at multiple frequencies," National Power Electronics Conference (NPEC), IIT Bhubaneswar, Dec 2021.

[C117] Kapil Upamanyu and G. Narayanan, "Analytical closed-loop response of discrete-PI-controlled high-bandwidth current loop in PWM converters & drives," IEEE International Conference on Power Electronics, Smart Grid and Renewable Energy, Kochi, Jan 2022.

[C118] Anupam Verma, Syed Shahjahan Ahmad and G. Narayanan, "Analytical prediction of static flux-linkage characteristics of switched reluctance machine," IEEE International Conference on Power Electronics, Smart Grid and Renewable Energy, Kochi, Jan 2022.

[C119] Lalgy Gopi and G. Narayanan, "Four-dimensional 24-sector SVPWM techniques for split-phase induction motor drives: analysis of modulation process and efficient implementation," IEEE International Conference on Power Electronics, Smart Grid and Renewable Energy, Kochi, Jan 2022.

[C120] Lalgy Gopi and G. Narayanan, "Advanced 24-sector bus-clamping PWM techniques for dual inverter-fed split-phase induction motor drives," IEEE International Conference on Power Electronics, Smart Grid and Renewable Energy, Kochi, Jan 2022.

[C121] Kamisetti N V Prasad, Shruti and G. Narayanan, "SiC based switch-mode power amplifier for active magnetic bearing," IEEE Power and Energy Conference at Illinois (PECI), University of Illinois at Urbana-Champaign, Illinois, USA, March 2022.

[C122] Syed Shahjahan Ahmad, Thirumalasetty Mouli and G. Narayanan, "Predictive current control of switched reluctance machine for accurate current tracking to enhance torque performance," IEEE IAS Global Conference on Emerging Technologies, May 2022, pp. 840-845.

[C123] Himanshu Mishra, R. Gnanavignesh and G. Narayanan, "Review of traction standards and simulation of traction power supply system," IEEE India Council International Subsections Conference (INDISCON), July 2022.

[C124] Mouli Thirumalasetty and G. Narayanan, “Modelling and controller design for simplified torque control of switched reluctance machine,” IEEE Energy Conversion Congress and Exposition (ECCE), Oct 2022.

[C125] Syed Shahjahan Ahmad, Kamisetti N V Prasad and G. Narayanan, “Improved short-circuit protection scheme with fast fault detection for SiC MOSFET,” IEEE Energy Conversion Congress and Exposition (ECCE), Oct 2022.

[C126] Syed Shahjahan Ahmad, Anupam Verma, Mouli Thirumalasetty, Vijai Biradar, Gopalaratnam Narayanan and Pramod Kumar, “Experimental investigations on 10,000-rpm slitted-rotor switched reluctance machine,” IEEE Energy Conversion Congress and Exposition (ECCE), Oct 2022.

[C127] Anupam Verma and Gopalaratnam Narayanan, “Analysis of total dc-bus current in single-pulse-operated switched reluctance machine drive,” IEEE Vehicle Power and Propulsion Conference (VPPC), Nov 2022.

[C128] Anupam Verma and Gopalaratnam Narayanan, “Optimal switching angles for switched reluctance generator operating under modified single-pulse-mode,” IEEE Vehicle Power and Propulsion Conference (VPPC), Nov 2022.

[C129] Aditya Raj, Syed Shahjahan Ahmad and G. Narayanan, “Experimental evaluation of high-frequency magnetization characteristics of core materials,” IEEE Power India International Conference (PIICON), Nov 2022.

[C130] Kamisetti N V Prasad and G. Narayanan, “Power-electronic-controlled electromagnetic axial bearings for high-speed electrical machines: status review and design example,” IEEE Power India International Conference (PIICON), Nov 2022.

[C131] Anupam Verma and Gopalaratnam Narayanan, “Modified single-pulse-operated switched reluctance generator: modeling, analysis and experimental verification,” IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES 2022), Jaipur, India, Dec 2022.

[C132] Mouli Thirumalasetty and G. Narayanan, “PWM-based optimal predictive direct torque control of switched reluctance machine,” IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES 2022), Jaipur, India, Dec 2022.

[C133] Syed Shahjahan Ahmad, Aditya Raj and G. Narayanan, “Improved direct-coupled high-bandwidth voltage amplifier for B-H characterization of magnetic materials,” IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES 2022), Jaipur, India, Dec 2022.

[C134] Kamisetti N V Prasad, G R Jayanth and G Narayanan, “Modelling, analysis and control of power-converter-fed electromagnetic bearing,” IEEE International Power and Renewable Energy Conference (IPRECON), Karunagapally, Kerala, India, Dec 2022.

[C135] Anuj Kumar, R. Muralidharan and G. Narayanan, “Comparison of GaN and GaAs based Hall magnetic sensor for power application,” IEEE International Symposium on Smart Electronic Systems (iSES), Warangal, Telangana, India, Dec 2022.

[C136] Thirumalasetty Mouli and G. Narayanan, “Extended horizon predictive current control of switched reluctance machine,” IEEE International Electric Machines & Drives Conference (IEMDC), San Francisco, CA, USA, May 2023.

[C137] Anupam Verma, Syed Shahjahan Ahmad and G. Narayanan, “Analytical tool for preliminary design of switched reluctance machine,” 11th International Conference on Power Electronics and ECCE Asia (ICPE 2023-ECCE Asia), Jeju Island, Korea, May 2023.

[C138] Ashutosh Patel, Kamisetti N V Prasad, Vijay Biradar, Pramod Kumar and G. Narayanan, "Structural analysis and determination of critical speed of a 10,000 rpm switched reluctance machine rotor," 9th IEEE India International Conference on Power Electronics (IEEE IICPE), Murthal, Haryana, Nov 2023.

[C139] Kamisetti N V Prasad and G. Narayanan, "Current tracking performance of an SiC power amplifier for control of electromagnetic bearing with good disturbance rejection," National Power Electronics Conference (NPEC), IIT Guwahati, Dec 2023.

[C140] Shreyas Srivatsa, Sakshi Narchail, Syed Shahjahan Ahmad, Ashutosh Patel, Pramod Kumar and G. Narayanan, "Experimental vibration studies of a 10 kW 30,000 rpm high-speed switched reluctance motor," National Power Electronics Conference (NPEC), IIT Guwahati, Dec 2023.

[C141] Mouli Thirumalasetty and G. Narayanan, "Experimental Identification of Mechanical Parameters for Speed Controller Design of Switched Reluctance Machine Drive," IEEE International conference on Energy Technologies for Future Grids (IEEE ETFG 2023), Wollongong, Australia, Dec 2023.

[C142] Ashutosh Patel, Kamisetti N V Prasad, Pramod Kumar and G. Narayanan, "Structural analysis of slitted rotor 10,000 rpm switched reluctance machine, "IEEE Third International Conference on Power, Control and Computing Technologies (IEEE ICPC²T 2024), Raipur, Chhattisgarh, Jan 2024.

[C143] Anupam Verma and G. Narayanan, "Comparison of optimized single-pulse and modified-single-pulse modes of operation of switched reluctance generator," IEEE International Conference on Computer, Electronics, Electrical Engineering & their Applications (IEEE IC2E3 2024), Srinagar Garhwal, Uttarakhand, June 2024.

[C144] Anupam Verma and G. Narayanan, "Single angle control based power regulation in modified single-pulse-operated switched reluctance generator," IEEE/IAS Industrial and Commercial Power System Asia (IEEE I&CPS Asia 2024), Pattaya, Thailand, July 2024.

[C145] Anupam Verma and G. Narayanan, "Improved small-signal model of single-pulse operated switched reluctance generator," IEEE/IAS Industrial and Commercial Power System Asia (IEEE I&CPS Asia 2024), Pattaya, Thailand, July 2024.

[C146] Samrat Das and G. Narayanan, "Estimation of effective air-gap in a switched reluctance machine from measured aligned inductance using a flux-tube-based approach," IEEE/IAS Industrial and Commercial Power System Asia (IEEE I&CPS Asia 2024), Pattaya, Thailand, July 2024.

[C147] Aditya Raj, Kamisetti N V Prasad and G. Narayanan, "Frequency-dependent model and improved controller design of an axial electromagnetic bearing," IEEE/IAS Industrial and Commercial Power System Asia (IEEE I&CPS Asia 2024), Pattaya, Thailand, July 2024.

[C148] Anupam Verma and G. Narayanan, "Analysis of switched reluctance generator operating in modified single-pulse mode," IEEE Internation Conference on Sustainable Energy and Future Electric Transportation (IEEE SEFET 2024), Hyderabad, Telangana, July/Aug 2024.

[C149] Anupam Verma and G. Narayanan, "Predictive dc-bus voltage control of switched reluctance generator above its base speed," IEEE Internation Conference on Sustainable Energy and Future Electric Transportation (IEEE SEFET 2024), Hyderabad, Telangana, July/Aug 2024.

[C150] Kamisetti N V Prasad, Syed Shahjahan Ahmad and G. Narayanan, "Analysis of overvoltage across blanking capacitor due to junction capacitance of sensing diode in desat protection of SiC

MOSFET," IEEE International Communications Energy Conference (IEEE INTELEC 2024), Bengaluru, Karnataka, Aug 2024.

[C151] Shreyas Srivatsa, Syed Shahjahan Ahmad, Samrat Das, Sakshi Narchail, Pramod Kumar and G. Narayanan, "Experimental studies on speed-dependent vibrations of a 30,000 rpm switched reluctance machine," IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES 2024), Surathkal, Karnataka, India, Dec 2024.

[C152] Samrat Das and G. Narayanan, "Analytical prediction of the unsaturated inductance profile of a switched reluctance machine using a flux-tube-based method," IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES 2024), Surathkal, Karnataka, India, Dec 2024.

[C153] Aditya Raj, Syed Shahjahan Ahmad and G. Narayanan, "Precision power amplifier with enhanced current capacity for characterization of magnetic materials," IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES 2024), Surathkal, Karnataka, India, Dec 2024.

[C154] Anuj Kumar and G. Narayanan, "Batch fabrication of AlGaN/GaN based Hall sensors for magnetic field sensing," 3rd International Conference on Smart Systems for Applications in Electrical Sciences (ICSSES 2025), Tumakuru. Karnataka, India, March 2025.

[C155] Kamisetti N V Prasad, Aditya Raj and G. Narayanan, "Experimental evaluation of force-current characteristics of a radial electromagnetic bearing," IEEE International Electric Machines & Drives Conference (IEMDC 2025), Houston, Texas, USA, May 2025.

[C156] Samrat Das, Krity Rao and G. Narayanan, "Performance evaluation of single-pulse-operated high-speed switched reluctance machine towards multi-objective optimization," IEEE International Electric Machines & Drives Conference (IEMDC 2025), Houston, Texas, USA, May 2025.

[C157] Samrat Das and G. Narayanan, "Closed-form analytical expression for moment of inertia of switched reluctance machine rotors," *2025 IEEE 2nd International Conference on Green Industrial Electronics and Sustainable Technologies (GIEST)*, Jamshedpur, India, 2025.

[C158] Samrat Das, Ashutosh Patel, Pramod Kumar, and G. Narayanan, "Investigation on speed-dependent no-load losses in a high-speed switched reluctance machine with oil-mist lubricated bearings," *2025 IEEE International Conference on Energy Technologies for Future Grids (ETFG)*, Wollongong, Australia, 2025.

[C159] Samrat Das and G. Narayanan, "Dynamic effects on flux linkage versus current contours in single-pulse-operated high-speed switched reluctance machine," 2025 IEEE 4th International Conference on Smart Technologies for Power, Energy and Control (STPEC), NIT Goa, Goa, India, Dec 2025.

[C160] Aditya Raj, K.N.V. Prasad and G. Narayanan, "Experimental studies on magnetization behaviour of axial electromagnetic bearings", 2025 IEEE 4th International Conference on Smart Technologies for Power, Energy and Control (STPEC), NIT Goa, Goa, India, Dec 2025.

[C161] Samrat Das and G. Narayanan, " Impact of asynchronous and synchronous sampling of rotor position on the performance of single-pulse-operated high-speed switched reluctance machine," *2025 National Power Electronics Conference (NPEC)*, NIT Calicut, India, 2025.

[C162] Shreyas Srivatsa, Syed Shahjahan Ahmad, Samrat Das, Sakshi Narchail, Ashutosh Patel, Pramod Kumar and G. Narayanan, "Experimental study of the natural frequencies of an assembled high-speed switched reluctance machine," *2025 National Power Engineering Conference (NPEC)*, NIT Calicut, India, 2025.

[C163] Anfas Rahman N, V. S. S. P. Kumar Hari, and G. Narayanan, “Starting transient analysis and pre-charge resistor design for diode-based or active front-end converters,” *2025 12th National Power Electronics Conference (NPEC)*, NIT Calicut, Kerala, India, Dec. 2025.

[C164] Aditya Raj, Syed Shahjahan Ahmad and G. Narayanan, “Frequency dependent magnetization behaviour of solid-steel core materials for axial electromagnetic bearings,” *2025 National Power Electronics Conference (NPEC)*, NIT Calicut, India, 2025.

Patents granted

[P1] Title: **Unitary stator, slit rotor and a switched reluctance device thereof**
Inventors: G. Narayanan, Pramod Kumar, Syed Shahjahan Ahmad, Eshan Dhar, Naveen.
Indian patent granted on 15 July 2022. Patent number: 401402.

[P2] Title: **System and method for fault detection in power semiconductor devices**
Inventors: G. Narayanan and Syed Shahjahan Ahmad
Indian patent granted on 8 Dec 2023. Patent number: 479437.

[P3] Title: **System and method for precision power amplification**
Inventors: G. Narayanan and Syed Shahjahan Ahmad
Indian patent granted on Mar 15, 2024. Patent number: 528363.

[P4] Title: **System and method for control of switched reluctance machine in a single pulse mode**
Inventors: G. Narayanan and Syed Shahjahan Ahmad
Indian patent granted on 22 Jan 2024. Patent number: 501711.

[P5] Title: **System and method for state prediction-based control of a switched reluctance machine**
Inventors: G. Narayanan and Syed Shahjahan Ahmad
Indian patent granted on 22 March 2023. Patent number: 426266.

[P6] Title: **Liquid cooling of electrical machines**
Inventors: G. Narayanan, Pramod Kumar, Syed Shahjahan Ahmad, Vijay Biradar, Shreyas Srivatsa
Indian patent granted on 29 March 2023. Patent number: 427638.

[P7] Title: **Fault tolerant synchronous inverter**
Inventors: G. Narayanan and Kapil Upamanyu
Indian patent granted on 31 July 2025. Patent number: 569388.

[P8] Title: **System and method for static and dynamic characterization of a rotor**
Inventors: G. Narayanan, Pramod Kumar, Syed Shahjahan Ahmad, Vijay Biradar, Shreyas Srivatsa, Angela Susan Markose, Aditya Raj
Indian patent granted on 25 July 2024. Patent number: 546006.

[P9] Title: **System and method for optimal control of DC bus current in switched reluctance machine**
Inventors: Anupam Verma and G. Narayanan
Indian patent granted on 30 Nov 2023. Patent number: 474984.

[P10] Title: **A test rig for determining characteristics of a gas-film thrust bearing**
Inventors: G. Narayanan, Pramod Kumar, Ashutosh Patel and Kamisetti N V Prasad
Indian patent granted on 9 July 2024. Patent number: 544562.

[P11] Title: **A test rig for determining characteristics of a magnetic thrust bearing and a system thereof**
Inventors: G. Narayanan, Pramod Kumar, Kamisetti N V Prasad and Ashutosh Patel
Indian patent granted on 6 March 2026. Patent number: 582462.

[P12] Title: **Method and system for controlling switched reluctance machine**
Inventors: G. Narayanan and Thirumalasetty Mouli
Indian patent granted on 24 Nov 2025. Patent number: 574396.

[P13] Title: **A Method for monitoring a multi-orifice fluid-film thrust bearing and a system thereof**

Inventors: Ashutosh Patel, Pramod Kumar, and G. Narayanan
Indian patent granted on 7 April 2026. Patent number: 586466.

[P14] Title: **An Integrated Device for Flow Field Monitoring and a Method of Manufacturing Thereof**
Inventors: M.M. Nayak, G. Narayanan, Pramod Kumar, Nitin Bhandary, Shreyas Srivatsa, and Ashutosh Patel.
Indian patent granted on 17 July 2026. Patent number :595900