Bio-data

Name: Dr. Piyush Kant

1. Education

Ph.D.

Electrical Engineering, Indian Institute of Technology Delhi, India

Specialization: Power Electronics, Electrical Machines and Drives (PEEMD)

Thesis supervisor: Prof. Bhim Singh

Thesis: Power Quality Improvement in Multi-Pulse Converter Fed Multilevel Inverter Based Induction Motor Drives

M.Tech.

Electrical Engineering, Motilal Nehru National Institute of Technology Allahabad, India

Specialization: Power Electronics and Drives

Thesis supervisor: Prof. Paulson Samuel

Thesis: Analysis and Implementation of Multicarrier Modulation for Marx multilevel Inverter

B.Tech.

Electrical Engineering, National Institute of Technology Agartala, India

Thesis supervisor: Prof. Ajoy Kumar Chakraborty

Thesis: Space Vector Modulation Techniques for Voltage Source Inverter

2. Experience

Assistant Professor (May 2022 - till date) at Indian Institute of Technology Kanpur, India.

Control Engineer (March 2020 - April 2022) at R&D department of Danfoss Drives, Chennai, India.

3. Research Interests

Multi-winding transformers for multi-pulse AC-DC converters

Multi-level inverters

Modulation techniques

Medium voltage drives

Electrical machines and drives

Motor control algorithms for electric vehicles

4. Publications

Patents:

[1] Bhim Singh and **Piyush Kant**, "A Multilevel-Inverter Fed Medium Voltage Induction Motor Drive," *Indian Patent No. 201911036380, Filed on: 10 September 2019*.

Journals:

[1] **Piyush Kant** and Bhim Singh, "Multi-pulse AC–DC converter fed SVM controlled NPC inverter based VCIMD," *IET Power Electronics,* vol. 11, no. 14, pp. 2204-2214, Oct.-2018.

[2] Bhim Singh and **Piyush Kant**, "Multipulse AC–DC Converter Fed 15-Level Cascaded MLI-Based IVCIMD for Medium-Power Application," *IEEE Transactions on Industry Applications,* vol. 55, no. 1, pp. 858-868, Jan.-Feb. 2019.

[3] Bhim Singh and **Piyush Kant**, "A 40-Pulse Multiphase Staggering Modular Transformer With Power Quality Improvement in Multilevel Inverter Fed Medium-Voltage Induction Motor Drives," *IEEE Transactions on Industry Applications,* vol. 55, no. 6, pp. 7822-7832, Nov.-Dec. 2019.

[4] **Piyush Kant** and Bhim Singh, "A New Three-Phase to Five-Phase Transformer with Power Quality Improvement in Hybrid-Multilevel Inverter Based VCIMD," *IEEE Transactions on Power Delivery,* vol. 35, no. 2, pp. 871-880, April 2020.

[5] **Piyush Kant** and Bhim Singh, "Multi-winding Transformer Fed CHB Inverter With On-Line Switching Angle Calculation Based SHE Technique for Vector Controlled Induction Motor Drive," *IEEE Transactions on Industry Applications,* vol. 56, no. 3, pp. 2807-2815, May-June 2020.

[6] Bhim Singh and **Piyush Kant**, "Multi-Winding Transformer for 18-Pulse AC-DC Converter Fed 7-Level CHB-Inverter with Fundamental Switching Based VCIMD," *IEEE Open Journal of the Industrial Electronics Society,* vol. 1, pp. 1-9, 2020.

[7] **Piyush Kant** and Bhim Singh, "A Sensorless DTC Scheme for 60-Pulse AC-DC Converter Fed 5-Level Six-Leg NPC Inverter Based Medium Voltage Induction Motor Drive," *IEEE Transactions on Energy Conversion,* vol. 35, no. 4, pp. 1916-1925, Dec. 2020.

[8] **Piyush Kant** and Bhim Singh, "MRAS Based Sensorless Vector Control Scheme for a 36-Pulse AC-DC Converter Fed 9-Level Cascaded H-Bridge -Inverter Driven Induction Motor Drive," *IET Power Electronics,* vol. 14, no. 3, pp. 706-716, Jan-2021.

[9] Nidhi Mishra, **Piyush Kant** and Bhim Singh, "Proportional-Resonant and Unipolar Switching Control of Single-Stage Solar Photovoltaic Grid Interfaced System," *IETE Journal of Research*, pp. 1-11, Jan-2021.

[10] Rohit Kumar, **Piyush Kant** and Bhim Singh, "Modified PWM Technique for a Multi-Pulse Converter fed Multilevel Inverter Based IM Drive," *IEEE Transactions on Industry Applications*, vol. 57, no. 6, pp. 6592-6602, Nov.-Dec. 2021.

[11] Rohit Kumar, **Piyush Kant** and Bhim Singh, "Harmonic Suppression Scheme for Multi-Pulse Converter Fed Multilevel Inverter Based IM Drive," *IEEE Transactions on Industry Applications*, vol. 57, no. 6, pp. 6058-6068, Nov.-Dec. 2021.

[12] Bhim Singh, Rohit Kumar and **Piyush Kant**, "Adjustable Speed Induction Motor Drive Fed by 13-Level Cascaded Inverter and 54-Pulse Converter," *IEEE Transactions on Industry Applications*, vol. 58, no. 1, pp. 890-900, Jan.-Feb. 2022.

[13] Rohit Kumar, **Piyush Kant** and Bhim Singh, "An 18-Pulse Converter and 4-Level Cascaded Inverter Based Induction Motor Drive," *IEEE Transactions on Industry Applications,* Early Access, doi: 10.1109/TIA.2022.3160150.

Conferences:

[1] **Piyush Kant**, Akbar Ahmad and Paulson Samuel, "Analysis and implementation of multicarrier modulation techniques for Marx multilevel inverter," *IEEE 15th International Conference on Environment and Electrical Engineering (EEEIC)*, June 2015, pp. 1149-1154.

[2] **Piyush Kant** and Bhim Singh, "An18-pulse AC-DC converter-fed 27-level inverter-based vector controlled induction motor drive," *IEEE 7th Power India International Conference (PIICON)*, Bikaner, 2016, pp. 1-6.

[3] **Piyush Kant** and Bhim Singh, "Twelve-Pulse AC-DC converter fed three-level NPC based field oriented controlled induction motor drive," *IEEE 7th India International Conference on Power Electronics (IICPE)*, Patiala, 2016, pp. 1-6.

[4] Bhim Singh and **Piyush Kant**, "A 54-pulse AC-DC converter fed 15-level inverter based vector controlled induction motor drive," *IEEE Industry Applications Society Annual Meeting*, Cincinnati, OH, 2017, pp. 1-7.

[5] **Piyush Kant**, Bhim Singh, Ambrish Chandra and Kamal Al-haddad, "Twenty pulse AC-DC converter fed 3-level inverter based vector controlled induction motor drive," *43rd Annual Conference of the IEEE Industrial Electronics Society (IECON)*, Beijing, 2017, pp. 2225-2230.

[6] **Piyush Kant** and Bhim Singh, "Thirty-six pulse AC-DC converter fed T-type inverter based vector controlled induction motor drive," *IEEE Transportation Electrification Conference (ITEC-India)*, Pune, 2017, pp. 1-6.

[7] **Piyush Kant** and Bhim Singh, "A 54-pulse AC-DC converter fed 7-level inverter based vector controlled induction motor drive," *National Power Electronics Conference (NPEC)*, Pune, 2017, pp. 153-159.

[8] **Piyush Kant** and Bhim Singh, "A multi-pulse AC-DC converter fed 5-level NPC inverter based VCIMD," *IEEE IEEMA Engineer Infinite Conference (eTechNxT)*, New Delhi, 2018, pp. 1-6.

[9] **Piyush Kant** and Bhim Singh, "A Multi-Pulse AC-DC Converter Fed Multi-Level Inverter for Power Quality Improvement in VCIMD," *IEEE Energy Conversion Congress and Exposition (ECCE)*, Portland, OR, 2018, pp. 4531-4536.

[10] **Piyush Kant** and Bhim Singh, "Power Quality Improvement in Sensorless Direct Torque Controlled Induction Motor Drive," *5th IEEE Uttar Pradesh Section International Conference on Electrical, Electronics and Computer Engineering (UPCON)*, Gorakhpur, 2018, pp. 1-6.

[11] **Piyush Kant** and Bhim Singh, "Multipulse AC-DC Conversion Fed 3rd Harmonic Injection Based SPWM Controlled Cascaded MLI Driven VCIMD," *2nd IEEE International Conference on Power Electronics, Intelligent Control and Energy systems (ICPEICES)*, Oct. 22–24, 2018 at Delhi Technological University, Delhi, India.

[12] **Piyush Kant** and Bhim Singh, "Sensorless Vector Controlled Induction Motor Drive for Medium Power Applications," *IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES)*, IIT Madras, Chennai, December 2018, pp. 1-5.

[13] Bhim Singh, Nidhi Mishra and **Piyush Kant**, "Power Quality Improvement in Single Phase Five Level Cascaded Grid Interfaced Systems," *IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES)*, IIT Madras, Chennai, December 2018 pp. 1-6.

[14] Nidhi Mishra, **Piyush Kant** and Bhim Singh, "An Asymmetric Seven Level Multilevel Converter for Grid Integrated Systems," *8th IEEE India International Conference on Power Electronics (IICPE), 2018*, pp. 1-6.

[15] **Piyush Kant** and Bhim Singh, "Multi-Winding Transformer Fed CHB Inverter with on-Line Switching Angle Calculation Based SHE Technique for VCIMD," *IEEE International Electric Machines & Drives Conference (IEMDC)*, San Diego, CA, USA, 2019, pp. 1256-1261.

[16] **Piyush Kant** and Bhim Singh, "Multi-Phase Transformer Configured 20-Pulse AC-DC Converter Fed Cascaded MLI Based Speed Sensorless Vector Controlled IMD," *IEEE International Conference on Electrical and Electronics Engineering (ICE3),* Gorakhpur, India, 2020, pp. 749-754.

[17] Rohit Kumar, **Piyush Kant** and Bhim Singh, "Modified PWM Technique for a Multi-Pulse Converter fed Multilevel Inverter Based IM Drive," *IEEE International Conference on Power Electronics, Smart Grid and Renewable Energy (PESGRE)*, Jan. 2020, pp. 1-6.

[18] Rohit Kumar, **Piyush Kant** and Bhim Singh, "Harmonic Suppression Scheme for Multi-Pulse Converter Fed Multilevel Inverter Based IM Drive," *IEEE 9th Power India International Conference (PIICON)*, March 2020, pp. 1-6.

[19] Bhim Singh, Rohit Kumar and **Piyush Kant**, "Adjustable Speed Induction Motor drive fed by 13-level Cascaded Inverter and 54-Pulse Converter," *IEEE Industry Applications Society Annual Meeting, Detroit, MI, USA*, Oct. 2020, pp. 1-7.

[20] Rohit Kumar, **Piyush Kant** and Bhim Singh, "An 18-Pulse Converter and 4-Level Cascaded Inverter Based Induction Motor Drive," *IEEE International Conference on Computing, Power and Communication Technologies (GUCON),* 2020, pp. 28-33.

[21] Rohit Kumar, Bhim Singh and **Piyush Kant**, "A 30-Pulse Converter and 4-Level Cascaded Inverter based Medium Voltage Drive using Modified LSPWM Technique," *IEEE 17th India Council International Conference (INDICON),* 2020, pp. 1-6.

[22] Rohit Kumar, Bhim Singh and **Piyush Kant**, "High Reliable Medium Voltage Drive with Reduced Component Count of Converters," *IEEE 6th International Conference on Computing, Communication and Automation (ICCCA),* 2021, pp. 328-333.

[23] Rohit Kumar, Bhim Singh and **Piyush Kant**, "Impact of Emerging Multi-pulse and Multi-Level Converters on Medium Voltage Induction Motor Drive," *IEEE 2nd International Conference on Smart Technologies for Power, Energy and Control (STPEC),* 2021, pp. 1-6.

[24] Rohit Kumar, Bhim Singh and **Piyush Kant**, "Variable Speed Induction Motor Drive Fed by 4-Level inverter and 18-Pulse Converter," *4th Biennial International Conference on Nascent Technologies in Engineering (ICNTE),* 2021, pp. 1-6.

[25] Rohit Kumar, Bhim Singh, **Piyush Kant** and Vivek Narayanan, "Adjustable Speed Medium Voltage Drive Fed by A 24-Pulse AC-DC Converter and 5-Level Multi-Level Inverter," *IEEE Energy Conversion Congress and Exposition (ECCE),* 2021, pp. 5170-5175.