

# Arpan Hota

ASISTANT PROFESSOR · MACHINE DRIVES AND POWER ELECTRONICS

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## Education

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### Indian Institute of Technology Bombay

Powai, Mumbai, India

PHD IN ELECTRICAL ENGINEERING

06/2016 - 08/2022

- Advisor: Dr. Vivek Agarwal

### National Institute of Technology Warangal

Warangal, India

M.TECH IN POWER ELECTRONICS AND DRIVES

06/2014 - 06/2016

- Advisor: Dr. Sachin Jain

### Jadavpur University

Kolkata

B.E. IN ELECTRICAL ENGINEERING

08/2009 - 06/2013

## Professional Experience

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2025-  
present

**Assistant Professor - Grade - II**, IIT Kharagpur, Department of Electrical Engineering,

Multilevel inverters, Electric Vehicles, PWM techniques, Dual active bridges

2024-2025

**Senior Design Engineer - Power Electronics**, Schneider Electric, Bengaluru,  
Three Phase Dual active bridge, Control board design, controller design, model based development, Grid connected single phase 5-level inverter control

2021-2024

**Senior Engineer**, FEV India Pvt Ltd, Pune division,  
1. Vehicle System Engineering: Development of electrical and logical architecture of a BEV e-powertrain, 5. Cell voltage balancing circuit and Model Based Development of Battery Management System

## Publications

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### JOURNAL PUBLICATIONS

Jagabar Sathik, M, N. Gopinath, **Arpan Hota**, Vijayakumar K, Saad Mekhilef, and Vivek Agarwal. 2024. Improved Dual Boost Mid-Point Clamped Five-Level Inverter Topology. *IEEE Transactions on Circuits and Systems II: Express Briefs*.

**Hota, Arpan**, and Vivek Agarwal. 2024. A Novel Leg-Integrated Switched Capacitor Inverter Topology for Three-Phase Induction Motor Drives. *IEEE Transactions on Industrial Electronics*, 71(5): 4353-4360.

**Hota, Arpan**, and Vivek Agarwal. 2022. A New H8 Inverter Topology With Low Common Mode Voltage and Phase Current THD for 3- $\phi$  Induction Motor Drive Applications. *IEEE Transactions on Industry Applications*, 58(5): 6245-6252.

**Hota, Arpan**, and Vivek Agarwal. 2022. A Novel Switched Capacitor Precharging Method for Three-Phase Induction Motor Drive Applications Utilizing the Winding Inductance. *IEEE Transactions on Industry Applications*, 58(5): 6237-6244.

**Hota, Arpan**, and Vivek Agarwal. 2022. Novel Switched Capacitor Quadruple-Boost Inverter Configuration for 3 $\phi$  Induction Motor Drive. *IEEE Journal of Emerging and Selected Topics in Power Electronics*, 10(5): 6093-6100.

Sathik, Mohamed Ali Jagabar, Marif Daula Siddique, N. Sandeep, **Arpan Hota**, Dhafer Almkhles, Saad Mekhilef, and Udaykumar R Yaragatti. 2022. Compact Quadratic Boost Switched-Capacitor Inverter. *IEEE Transactions on Industry Applications*, 58(4): 4923-4931.

- Hota, Arpan**, and Vivek Agarwal. 2022. A New Three-Phase Inverter Topology for Reducing the dv/dt and Peak-to-Peak Value of Common Mode Voltage. *IEEE Transactions on Industrial Electronics*, 69(12): 11979-11986.
- Hota, Arpan**, and Vivek Agarwal. 2022. Novel Three-Phase H10 Inverter Topology With Zero or Constant Common-Mode Voltage for Three-Phase Induction Motor Drive Applications. *IEEE Transactions on Industrial Electronics*, 69(7): 7522-7525.
- Mohamed Ali, Jagabar Sathik, **Arpan Hota**, N. Sandeep, and Dhafer J. Almakhlis. 2022. A Single-Stage Common Ground-Type Transformerless Five-Level Inverter Topology. *IEEE Journal of Emerging and Selected Topics in Power Electronics*, 10(1): 837-845.
- Dhara, Sumon, **Arpan Hota**, Sachin Jain, and Vivek Agarwal. 2021. A Transformerless 1- $\phi$ , 5-Level Half-Bridge PV Inverter Configuration Based on Switched-Capacitor Technique. *IEEE Transactions on Industry Applications*, 57(2): 1619-1628.
- Hota, Arpan**, Mohammad M. Qasim, James L. Kirtley, and Vivek Agarwal. 2021. Novel Switched Capacitor Boost Inverter Configuration for Three-Phase Induction Motor Driven Home Appliances. *IEEE Transactions on Industry Applications*, 57(2): 1450-1458.
- Bharath, G Veera, **Arpan Hota**, and Vivek Agarwal. 2020. A New Family of 1- $\phi$  Five-Level Transformerless Inverters for Solar PV Applications. *IEEE Transactions on Industry Applications*, 56(1): 561-569.
- Arpan Hota**, Sachin Jain, and Vivek Agarwal. 2018. An Improved Three-Phase Five-Level Inverter Topology With Reduced Number of Switching Power Devices. *IEEE Transactions on Industrial Electronics*, 65(4): 3296-3305.
- Arpan Hota**, Sachin Jain, and Vivek Agarwal. 2017. A Modified T-Structured Three-Level Inverter Configuration Optimized With Respect to PWM Strategy Used for Common-Mode Voltage Elimination. *IEEE Transactions on Industry Applications*, 53(5): 4779-4787.
- Arpan Hota**, Sachin Jain, and Vivek Agarwal. 2017. An Optimized Three-Phase Multilevel Inverter Topology With Separate Level and Phase Sequence Generation Part. *IEEE Transactions on Power Electronics*, 32(10): 7414-7418.

## CONFERENCE PAPERS

- S. D. Ratrey, **Arpan Hota**, V. Sonti and S. Jain, "A New Three-Phase Three-Level Inverter Obtained From Two-Level Inverter By Considering the Effect of Device Junction Capacitance Across the Switch," 2023 IEEE 3rd International Conference on Sustainable Energy and Future Electric Transportation (SEFET), Bhubaneswar, India, 2023, pp. 1-5, doi: 10.1109/SeFeT57834.2023.10245984.
- Arpan Hota** and V. Agarwal, "A Modified 2-level Three-Phase Inverter Topology with Common Mode Voltage Performance of a 3-level Inverter," 2021 International Conference on Sustainable Energy and Future Electric Transportation (SEFET), Hyderabad, India, 2021, pp. 1-6, doi: 10.1109/SeFet48154.2021.9375810.
- Arpan Hota**, V. Sonti, S. Jain and V. Agarwal, "A Novel Single-Phase Switched-Capacitor Based 5-level Inverter Topology Featuring Voltage Boosting Capability and Common Mode Voltage Reduction," 2021 International Conference on Sustainable Energy and Future Electric Transportation (SEFET), Hyderabad, India, 2021, pp. 1-5
- Arpan Hota** and V. Agarwal, "A Novel Three Phase Induction Motor Drive for Ceiling Fan Application with Improved Dc-link Utilization," 2021 International Conference on Sustainable Energy and Future Electric Transportation (SEFET), Hyderabad, India, 2021, pp. 1-5, doi: 10.1109/SeFet48154.2021.9375648.
- Arpan Hota**, V. Sonti, S. Jain and V. Agarwal, "A Novel Single-Phase Switched-Capacitor Transformer-less 5-level Inverter Topology with Voltage Boosting," 2021 International Conference on Sustainable Energy and Future Electric Transportation (SEFET), Hyderabad, India, 2021, pp. 1-5, doi: 10.1109/SeFet48154.2021.9375800.
- Arpan Hota**, V. Sonti, S. Jain and V. Agarwal, "Common Mode Voltage Elimination in Single-Phase Multilevel Inverter using a 3rd Leg," 2021 International Conference on Sustainable Energy and Future Electric Transportation (SEFET), Hyderabad, India, 2021, pp. 1-5, doi: 10.1109/SeFet48154.2021.9375643.
- A. Chaudhury, V. Sonti, **Arpan Hota**, A. R. Saxena and S. Jain, "A New Single-Phase Five-Level Neutral Point Clamped Cascaded Multilevel Inverter for Minimization of Leakage Current in PV Systems," 2021 International Conference on Sustainable Energy and Future Electric Transportation (SEFET), Hyderabad, India, 2021, pp. 1-5.
- A. Chaurasia and **Arpan Hota**, "A Novel Switched Capacitor 4-level Single-Phase Inverter with Voltage Boosting and Common Ground," 2020 IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES), Jaipur, India, 2020, pp. 1-4, doi: 10.1109/PEDES49360.2020.9379750.
- S. V. S. P. Kumar.Ch, S. Jain, **Arpan Hota** and V. Sonti, "Performance analysis of Closed Loop Hysteresis Control of a PV based 8/6 Pole and 10/8 Pole Switched Reluctance Motor for EV Application," 2020 IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES), Jaipur, India, 2020, pp. 1-5, doi: 10.1109/PEDES49360.2020.9379719.

- Arpan Hota** and V. Agaral, "Novel Pre-charging Method for a Switched Capacitor Voltage Boosted Three-Phase Induction Motor Drive," 2020 IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES), Jaipur, India, 2020, pp. 1-4, doi: 10.1109/PEDES49360.2020.9379832.
- G. V. Bharath, **Arpan Hota** and V. Agarwal, "A Novel Single-Phase Five-Level Transformerless H9 Inverter with Voltage Boosting Capability," 2020 IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES), Jaipur, India, 2020, pp. 1-5, doi: 10.1109/PEDES49360.2020.9379512.
- Arpan Hota** and V. Agaral, "A Novel Three-Phase Induction Motor Drive with Voltage Boosting Capability, Low Current THD and Low Common Mode Voltage," 2020 IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES), Jaipur, India, 2020, pp. 1-4, doi: 10.1109/PEDES49360.2020.9379655.
- M. D. Siddique et al., "A Reduced Switch Count Boost Inverter (RSC- BI) Topology with Triple Voltage Gain," 2020 IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES), Jaipur, India, 2020, pp. 1-6, doi: 10.1109/PEDES49360.2020.9379824.
- Arpan Hota**, M. Qasim, J. L. Kirtley and V. Agarwal, "Novel Boost Inverter Configuration and 3- $\phi$  Induction Motor Drive for Home Appliances," 2019 Innovations in Power and Advanced Computing Technologies (i-PACT), Vellore, India, 2019, pp. 1-5, doi: 10.1109/i-PACT44901.2019.8960131.
- Arpan Hota**, M. Qasim, J. L. Kirtley and V. Agarwal, "A Low Cost Electrolytic Capacitor-less Induction Motor Drive Based on a Novel Open Loop Model Predictive Control Strategy," 2019 Innovations in Power and Advanced Computing Technologies (i-PACT), Vellore, India, 2019, pp. 1-5, doi: 10.1109/i-PACT44901.2019.8960250.
- S. Dhara, **Arpan Hota**, S. Jain and V. Agarwal, "A Novel Single-Phase T-Type PV Inverter with Improved DC Utilization," 2018 IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES), Chennai, India, 2018, pp. 1-5, doi: 10.1109/PEDES.2018.8707716.
- Arpan Hota**, M. Qasim, J. L. Kirtley and V. Agarwal, "A Novel Three-Phase Induction Motor Drive for Domestic Fan Application with Improved Reliability," 2018 IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES), Chennai, India, 2018, pp. 1-5, doi: 10.1109/PEDES.2018.8707651.
- G. V. Bharath, **Arpan Hota** and V. Agarwal, "A novel switched-capacitor based single-phase five-level transformerless inverter," 2018 International Conference on Power, Instrumentation, Control and Computing (PICC), Thrissur, India, 2018, pp. 1-6, doi: 10.1109/PICC.2018.8384785.

## PATENTS (GRANTED/FILED)

- "Quasi multilevel inverter (QMLI) for multi-phase applications"- Granted on 16/01/2023 (IN patent No: 418210, Application No 202221006502). Inventors: **Arpan Hota** and Vivek Agarwal
- "System for balancing energy stored in a battery"- filed on 07-02-2023 (IN Patent Application No. 202311007753). Inventors: **Arpan Hota**, Nand Gavali, Sumon Dhara, and Yash Sukhatme
- "System and Apparatus for Integrated Active Pre-charge and Active Cell Balancing of Series Connected Battery Cells"- Inventors: **Arpan Hota**, and Nand Gavali

## Awards, Fellowships, & Grants

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- 2022 **Outstanding Reviewer Award**, Indian Institute of Technology Bombay, for the role as a reviewer in IEEE Transactions on Power Electronics. Issued by IEEE Power Electronics Society
- 2021 **Paper Award**, Indian Institute of Technology Bombay, Paper award in 2021 for the paper: A. Hota, V. Sonti, S. Jain and V. Agarwal, "A Novel Single-Phase Switched-Capacitor Based 5-level Inverter Topology Featuring Voltage Boosting Capability and Common Mode Voltage Reduction," 2021 International Conference on Sustainable Energy and Future Electric Transportation (SEFET), Hyderabad, India, 2021, pp. 1-5.
- 2021 **Excellence in Teaching Assistantship award**, Indian Institute of Technology Bombay, Excellence in Teaching Assistantship award for the course "Introduction to Electrical and Electronics Circuits (EE-101) in the Autumn semester of Academic Year 2020-21.
- 2016 **Tata Fellowship**, Indian Institute of Technology Bombay, Selected for the Tata Fellowship offered by Tata Centre for Technology and Design – IIT Bombay.
- 2016 **First Class with Distinction**, National Institute of Technology Warangal, Secured First Class with Distinction in M. Tech
- 2016 **first prize in Engineer Infinite 2016**, National Institute of Technology Warangal, Won first prize (cash award of INR 2,00,000) in Engineer Infinite 2016 (a nationwide project competition part of ELECRAMA-2016), among 1500 projects for the project: "Optimized three phase multilevel inverter with common mode voltage elimination"

## Teaching Experience

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- 2016-2020 **Teaching Assistantship, Electrical Engineering Department**, Indian Institute of Technology Bombay, Course assisted - Introduction to Electrical and Electronic Circuits (EE101), Power Electronics minor (EE321), Control systems laboratory (EE211), Electrical machines laboratory (EE-234).
- Spring-2018 **Teaching Assistantship, NPTEL online certification course**, Indian Institute of Technology Bombay, "Fundamentals of Power Electronics" Course instructor Prof. Vivek Agarwal
- 2014-2016 **Teaching Assistantship, Electrical Engineering Department**, National Institute of Technology Warangal, Electrical Machines Laboratory, Electric Drives Laboratory

## Outreach & Professional Development

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### SERVICE

2024 **IEEE conference ICPCCT**, Meta Reviewer

*NIT Raipur*

### PEER REVIEW

1. IEEE Transactions on Power Electronics.
2. IEEE Transactions on Industry Applications.
3. IEEE Transactions on Industrial Electronics.
4. IEEE Journal of Emerging and Selected Topics on Power Electronics.
5. IEEE Access 6. Journal of Modern Power Systems and Clean Energy (Springer).

## PROFESSIONAL MEMBERSHIPS

IEEE graduate student member (No. 94980212)