

# AMIT GUPTA

## PHD, ELECTRICAL ENGINEERING

### CONTACT INFO



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### OBJECTIVE

Motivated Ph.D. scholar in Electrical Engineering, specializing in power electronics for power system applications. With experience as a Project Scientist and strong hands-on research expertise, I seek to advance R&D efforts focused on microgrids and distributed energy systems by designing advanced control strategies that enhance system stability.

### PROJECT EXPERIENCE

#### Visiting Project Scientist at SINTEF, Trondheim, Norway

Nov 2022- Dec 2022

Developed and evaluated interconnection protocols for heterogeneous mini grids or micro grids by analysing existing standards and proposing seamless operating guidelines, supported through both numerical simulations and experimental validation on physically existing microgrids in India.

### RESEARCH EXPERIENCES

#### Design and Development of Advanced Controller for Interconnection of Multiple Microgrids

July 2020-Present

- Developed advanced control strategies for heterogeneous microgrids enabling seamless synchronization under balanced/unbalanced conditions, cost-optimal power sharing, and enhanced stability of grid-forming inverters during fault scenarios.
- Built detailed simulations and a 20 kW prototype microgrid with heterogeneous distributed generators to experimentally validate synchronization performance, power-sharing capability, and overall system stability.
- Developed a validation framework in OPAL-RT with Power Hardware-in-the-Loop (PHIL) capability to integrate and test the proposed controller with existing bigger microgrid control systems.

#### Dual Input Dual Output Isolated DC-DC Converter for power management of DC distribution system

May 2019-April 2020

- Developed simulation in PSIM software to visualize the converter's ability to maintain a constant output voltage, track the maximum power point, and shift between MPPT mode and CPG mode under varying solar irradiance conditions.
- Designed an LCL resonance circuit to facilitate soft-switching and eliminate switching losses, ensuring easy integration with photovoltaic systems and energy storage devices.

#### Design of Peltier Water Cooler

Jan 2017-August 2017

Developed a Peltier water cooler system in a real-life hardware setup, achieving effective temperature reduction and cooling performance.

### EDUCATIONAL BACKGROUND

#### Ph.D. (Electrical Engineering)

July 2020-Present

Indian Institute of Technology Bhubaneswar (IIT Bhubaneswar), Odisha, India

CGPA: 7.94/10

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#### Master of Technology (M.Tech in Power Electronics and Drives)

June 2018-May 2020

National Institute of Technology Delhi (NIT Delhi), Delhi, India

CGPA: 7.99/10

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#### Bachelor of Technology (B.Tech in Electrical Engineering)

June 2013- June 2017

Madhav Institute of Technology & Science, Gwalior, M.P., India

CGPA: 7.07/10

## SKILLS

- **Software:** MATLAB, PSIM, LTSpice, KiCad, Basic Python language
- **Other Tools & Technologies:** dSpace, OPAL-RT, DigSILENT, WAVECT, Hardware Design and Testing
- **Applications:** Microsoft Powerpoint, Excel, Word, Latex
- **Language Proficiency:** English & Hindi (Speaking, Reading, and Writing-Fluent)
- Effective Leadership and adaptive to collaborations.

## ACHIEVEMENTS

- Received MHRD PhD Fellowship from the Govt. of India (2023-2025).
- Received project fellowship from DST, Govt. of India (2020-2023).
- Received the Transnational Access Researcher fellowship grant under the European Union's ERIGrid (H2020) programme (2022).
- Qualified GATE in 2018 and received AICTE Fellowship from the Govt. of India (2018-2020).

## VOLUNTEER EXPERIENCE

- Track Coordinator for the 11th National Power Electronics Conference (NPEC-2021) at IIT Bhubaneswar.
- Coordinator for the 4th National Workshop on "Recent Developments in Smart Grid Technologies (NWSGT-2025)" at IIT Bhubaneshwar during 7th-8th March 2025.

## INVITED TALKS

- INDNOR MultiGrid Workshop on "Integrations, Control, and Interconnection of Microgrids/Minigrids" at IIT Bhubaneswar.
- INDNOR MultiGrid Workshop on "Synchronization controllers and protocols for largely dispersed minigrids" at SINTEF, Norway.

## PUBLICATIONS

### Journals

- **A. Gupta**, P.C. Sekhar, M.Z. Degefa, S. D'Arco' "A Unified Controller for Interconnection of Heterogeneous, Multi-DG Mini/Microgrids with Varying Dynamic Characteristics", in IEEE Journal of Emerging and Selected Topics in Industrial Electronics, doi: 10.1109/JESTIE.2025.3642906. (I.F.: 4)
- **A. Gupta**, P.C. Sekhar, "A Droop Based Unified Synchronization Scheme with Adaptive Phase and Frequency Loop Integration for Interconnection of Heterogeneous Microgrids". (1st revision completed in IEEE Transactions on Power Electronics)
- **A. Gupta**, P.C. Sekhar, "Enhanced Transient Stability Strategy for Grid-Forming Inverters Operating in Current Limiting Mode". (Communicated in IEEE Transaction on Power Electronics).
- **A. Gupta**, P.C. Sekhar, "A Multi-Segment Adaptive Droop Control Strategy for Optimal Power Sharing in Renewable Dominated Islanded Microgrids". Invited to submit in IEEE Transactions on Industry Applications.

### Conferences

- **A. Gupta** and P. C. Sekhar,"A Sliding Mode-based Negative Sequence Compensation for Seamless Interconnection of Microgrids under Unbalanced Condition", 2025 International Conference on Power Electronics and Energy (ICPEE), Bhubaneswar, India, 2025, pp. 1-6.
- **A. Gupta** and P. C. Sekhar,"Dynamic Droop Control for Optimal Power Sharing in Renewable Rich Hybrid Islanded Microgrids", 2024 IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES), Mangalore, India, 2024, pp. 1-6.
- **A. Gupta**, P. C. Sekhar, M. Z. Degefa, K. Jonatan R. A. and S. D'Arco, "Synchronization Controller for Seamless Interconnection of Mirogrids with Heterogeneous Sources," 2022 22nd National Power Systems Conference (NPSC), New Delhi, India, 2022, pp. 344-349.
- **A. Gupta** and P. C. Sekhar, "A Review of Control Strategies for Operation of Distributed Resources Under Grid Faults," 2022 IEEE PES Innovative Smart Grid Technologies - Asia (ISGT Asia), Singapore, Singapore, 2022, pp. 200-204.
- M. Z. Degefa, J. R. A. Klemets, S. D'Arco, P. C. Sekhar and **A.Gupta**, "Review of Grid Interconnection Requirements and Synchronization Controllers for Dispersed Minigrids," 2021 IEEE PES/IAS Power Africa, Nairobi, Kenya, 2021, pp. 1-5.
- **A. Gupta** and A. R. Saxena, "An Isolated Dual-Input Dual-Output DC-DC Converter with Bi-directional Feature for Low Voltage DC Grids," 2020 IEEE First International Conference on Smart Technologies for Power, Energy and Control (STPEC), Nagpur, India, 2020, pp. 1-6.

## REFERENCES

- Dr. Chandrasekhar Perumalla, IIT Bhubaneswar, Odisha, India (Email id: [pcsekhar@iitbbs.ac.in](mailto:pcsekhar@iitbbs.ac.in))
- Dr. Anmol Ratna Saxena, NIT Delhi, Delhi, India (Email id: [anmolsaxena@nitdelhi.ac.in](mailto:anmolsaxena@nitdelhi.ac.in))