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Employment**The University of Texas at Dallas**

Assistant Professor

Aug, 2017 - Present

FREEDM Systems Center, North Carolina State University

PostDoctoral Researcher

June, 2016 - July 2017

Department of Energy Technology, Aalborg University

PostDoctoral Researcher

March, 2016 - June, 2016

Siemens AG - Siemens Technology and Services

Lead Research Engineer

Jan, 2012 - Oct, 2012

Global R & D Centre - Crompton Greaves Ltd.

Deputy Manager Technology

July, 2011 - Jan, 2012

Valia Institute of Technology

Lecturer

Sept, 2001 - June, 2009

Education**Aalborg University, Aalborg, Denmark**

Ph.D.

May, 2013 - March, 2016

- Dissertation Topic: Modulation and Circulating Current Suppression for Parallel Interleaved Voltage Source Converters

Indian Institute of Technology, Bombay, India

Master of Technology, Power Electronics and Power Systems

June, 2009 - July, 2011

GPA: 9.85/10 (*secured first rank*)

- Master Thesis: "Design and fabrication of Auxiliary Power Support System for Back-up and Transient Stability in a Micro-Grid Environment using Fuel Stack and Ultra Capacitor"

Research Interests

- Applications of wide band-gap devices (SiC, GaN, and medium voltage 10 kV SiC devices) in AC/DC, DC/DC and rectifiers.
- High power density converter design for Vehicle applications.
- Operation and control of hybrid (AC/DC) micro-grid.
- Medium voltage high power DC-DC converters for off-shore wind farms and future dc networks.
- Wide band-gap devices and packaging.
- Pulse width modulation techniques.
- Line filter design for the grid-connected converters.
- Multi-objective optimization of power converters.

Professional Activities

- Reviewer:
 - IEEE Transactions on Power Electronics
 - IEEE Transactions on Industrial Electronics
 - IEEE Transactions on Industry Applications
 - IEEE Journal of Emerging and Selected Topics in Power Electronics
 - IEEE Transactions on Vehicular Technology
 - IET Circuits, Devices & Systems
 - IEEE Transactions on Industrial Informatics
 - IET Power Electronics
 - Applied Power Electronics Conference (APEC)
 - Energy Conversion Congress and Exposition (ECCE)
 - Annual Conference of the IEEE Industrial Electronics Society (IECON)
 - Energies
- Registration chair: MWSCAS 2019
- Committee member: IEEE PELS "My PhD in 200 seconds" award committee
- Session-Chair: Energy Conversion Congress and Exposition (ECCE) conference
- Session-chair: Applied power electronics conference

Departmental Activities

- Member:
 - Graduate Committee

Journal Publications

- J1. **G. Gohil**, L. Bede, R. Teodorescu, T. Kerekes, and F. Blaabjerg, "Line filter design of parallel interleaved VSCs for high power wind energy conversion systems," *IEEE Transactions on Power Electronics*, vol. 30, no. 12, pp. 6775 - 6790, Dec 2015.
- J2. **G. Gohil**, R. Maheshwari, L. Bede, T. Kerekes, R. Teodorescu, M. Liserre and F. Blaabjerg, "Modified discontinuous PWM for size reduction of the circulating current filter in parallel interleaved converters," *IEEE Transactions on Power Electronics*, vol. 30, no. 7, pp. 3457 - 3470, July 2015.
- J3. **G. Gohil**, L. Bede, R. Teodorescu, T. Kerekes, and F. Blaabjerg, "An integrated inductor for parallel interleaved VSCs and PWM schemes for flux minimization," *IEEE Transactions on Industrial Electronics*, vol. 62, no. 12, pp. 7534-7546, Dec 2015.
- J4. **G. Gohil**, L. Bede, R. Teodorescu, T. Kerekes, and F. Blaabjerg, "An integrated inductor for parallel interleaved three-phase voltage source converter," *IEEE Transactions on Power Electronics*, vol. 31, no. 5, pp. 3400-3414, May 2016.
- J5. **G. Gohil**, L. Bede, R. Teodorescu, T. Kerekes, and F. Blaabjerg, "Magnetic Integration for Parallel Interleaved VSCs Connected in a Whiffletree Configuration," *IEEE Transactions on Power Electronics*, vol. 31, no. 11, pp. 7797-7808, Nov 2016.
- J6. **G. Gohil**, L. Bede, R. Teodorescu, T. Kerekes, and F. Blaabjerg, "Dual converter fed open-end transformer topology with parallel converters and integrated magnetics," *IEEE Transactions on Industrial Electronics*, vol. 63, no. 8, pp. 4929-4941, Aug 2016.
- J7. **G. Gohil**, L. Bede, R. Teodorescu, T. Kerekes, and F. Blaabjerg, "Flux Balancing Scheme for PD Modulated Parallel Interleaved Inverters," *IEEE Transactions on Power Electronics*, [Online early access], DOI: 10.1109/TPEL.2016.2589944, 2016.

- J8. **G. Gohil**, L. Bede, R. Teodorescu, T. Kerekes, and F. Blaabjerg, "Optimized harmonic filter inductor for dual-converter fed open-end transformer topology," *IEEE Transactions on Power Electronics*, [Online early access], DOI: 10.1109/TPEL.2016.2562679, 2016.)
- J9. R. Maheshwari, **G. Gohil**, L. Bede and S. Munk-Nielsen, "Analysis and Modeling of Circulating Current in Two Parallel-Connected Inverters," *IET Power Electronics*, vol. 8, no. 7, pp. 1273 - 1283, 2015.
- J10. A. Anurag, S. Acharya, Y. Prabowo, **G. Gohil**, and S. Bhattacharya, "Design Considerations and Development of an Innovative Gate Driver for Medium Voltage Power Devices with High dv/dt," *IEEE Transactions on Power Electronics*, [Online early access], DOI: 10.1109/TPEL.2018.2870084, 2018.

**Journals papers
in review**

1. **G. Gohil**, L. Bede, R. Teodorescu, T. Kerekes, and F. Blaabjerg, "Modulation of Grid-Connected Parallel Interleaved Inverters and Its Impact on Filter Components,"

**Journals papers
in preparation**

1. **G. Gohil**, L. Bede, R. Teodorescu, T. Kerekes, and F. Blaabjerg, "Optimized Grid-Side Converter using Parallel Interleaved VSCs for High Power Wind Turbines,"

**Conference
Presentations**

- C1. **G. Gohil**, L. Bede, R. Teodorescu, T. Kerekes, and F. Blaabjerg, "Design of the trap filter for the high power converters with parallel interleaved VSCs," *in Proc. 40th Annual Conference on IEEE Industrial Electronics Society, IECON 2014*, Oct 2014, pp. 2030-2036.
- C2. **G. Gohil**, L. Bede, R. Maheshwari, R. Teodorescu, T. Kerekes, and F. Blaabjerg, "Parallel interleaved VSCs: influence of the PWM scheme on the design of the coupled inductor," *in Proc. 40th Annual Conference on IEEE Industrial Electronics Society, IECON 2014*, Oct 2014, pp. 1693-1699.
- C3. **G. Gohil**, L. Bede, R. Teodorescu, T. Kerekes, and F. Blaabjerg, "Analytical method to calculate the DC link current stress in voltage source converters," *in Proc. IEEE International Conference on Power Electronics, Drives and Energy Systems, PEDES 2014*, Dec 2014.
- C4. **G. Gohil**, L. Bede, R. Teodorescu, T. Kerekes, and F. Blaabjerg, "Integrated Inductor for Interleaved Operation of Two Parallel Three-phase Voltage Source Converters," *in Proc. 17th European Conference on Power Electronics and Applications, EPE'15 ECCE-Europe*, Sept 2015, pp. 1-10.
- C5. **G. Gohil**, L. Bede, R. Teodorescu, T. Kerekes, and F. Blaabjerg, "An integrated inductor for parallel interleaved VSCs connected in a whiffletree configuration," *in Proc. IEEE Energy Conversion Congress and Exposition, ECCE'15*, Sept 2015, pp. 5952-5959.
- C6. **G. Gohil**, L. Bede, R. Teodorescu, T. Kerekes, and F. Blaabjerg, "Magnetic integration of the harmonic filter inductor for dual-converter fed open-end transformer topology," *in Proc. Annual IEEE Applied Power Electronics Conference and Exposition, APEC 2016*, pp. 2264-2271.
- C7. **G. Gohil**, L. Bede, R. Teodorescu, T. Kerekes, and F. Blaabjerg, "Comparative Evaluation of Modulation Schemes for Grid-connected Parallel Interleaved Inverters," *Accepted for publication in PEDG, 2016*.
- C8. **G. Gohil**, L. Bede, R. Teodorescu, T. Kerekes, and F. Blaabjerg, "Comparative Evaluation of Circulating Current Suppression Methods for Parallel Interleaved Inverters for Large Wind Turbines," *Accepted for publication in ECCE, 2016*.
- C9. **G. Gohil**, H. Wang, M. Liserre, T. Kerekes, R. Teodorescu and F. Blaabjerg, "Reduction of DC-link Capacitor in Case of Cascade Multilevel Converters by means of Reactive Power Control," *in Proc. 29th Annual IEEE Applied Power Electronics Conference and Exposition, APEC 2014*, pp. 231-238.

- C10. **G. Gohil**, L. Bede, R. Teodorescu, T. Kerekes, and F. Blaabjerg, “Analytical method to calculate the DC link current stress in voltage source converters, ”in *Proc. IEEE International Conference on Power Electronics, Drives and Energy Systems*, PEDES 2014, Dec 2014.
- C11. R. Maheshwari, I. Trintis, **G. Gohil**, S. Chaudhary and S. Munk-Nielsen, “Control of SiC Based Front-End Rectifier under Unbalanced Supply Voltage, ”(Presented at EPE 2015, ECCE Europe)
- C12. L. Bede, **G. Gohil**, T. Kerekes, L. Mathe, and R. Teodorescu, “Optimal Interleaving Angle Determination in Multi Paralleled Converters Considering the DC Current Ripple and Grid Current THD, ”in *Proc. 9th International Conference on Power Electronics and ECCE Asia*, ICPE-ECCE Asia 2015, June 2015, pp. 1195-1202.
- C13. L. Bede, **G. Gohil**, T. Kerekes, M. Ciobotaru, R. Teodorescu and V. Agelidis “Comparison between grid side and inverter side current control for parallel interleaved grid connected converters, ”in *Proc. 17th European Conference on Power Electronics and Applications*, EPE’15 ECCE-Europe, Sept 2015, pp. 1-10.
- C14. L. Bede, **G. Gohil**, M. Ciobotaru, T. Kerekes, R. Teodorescu and V. Agelidis, “Circulating Current Controller for Parallel Interleaved converters using PR Controllers, ”(Presented at IECON 2015)
- C15. L. Bede, **G. Gohil**, M. Ciobotaru, T. Kerekes, R. Teodorescu and V. Agelidis, “Fault ride-through performance evaluation of grid-connected converter employing low switching frequency, in *Proc. Annual IEEE Applied Power Electronics Conference and Exposition*, APEC 2016, pp. 1702-1707.
- C16. R. P. Alzola, **G. Gohil**, L. Mathe, M. Liserre and F. Blaabjerg, “Review of modular power converters solutions for smart transformer in distribution system, ”in *Proc. of the IEEE Energy Conversion Congress and Exposition*, ECCE 2013, pp. 380-387.
- C17. R. Maheshwari, **G. Gohil**, L. Bede and S. Munk-Nielsen, “Effect of dead-time in interleaved PWM for two parallel-connected inverters, ”in *Proc. 17th European Conference on Power Electronics and Applications*, EPE’15 ECCE-Europe, Sept 2015, pp. 1-7.
- C18. R. Chattopadhyay, **G. Gohil**, and S. Bhattacharya, “Split-Winding Type Three Limb Core Three Port Transformer for Integrating PV and Energy Storage(ES), ”in *Proc. of the IEEE Energy Conversion Congress and Exposition*, ECCE 2017, Oct 2017.
- C19. I. Trintis, **G. Gohil**, S. Pallesgaard, F. Mikael, T. Pedersen, S. Nielsen, and P. Kjaer, “Line reactor for parallel-interleaved high power inverters, ”in *Proc. 19th European Conference on Power Electronics and Applications*, EPE’17 ECCE Europe.
- C20. **G. Gohil**, R. Teodorescu, T. Kerekes, F. Blaabjerg, and S. Bhattacharya “Mission-Profile based Multi-Objective Optimization of Three-Level Converter Realized Using Parallel Interleaved Inverters, ”in *Proc. of the IEEE Energy Conversion Congress and Exposition*, ECCE 2017, Oct 2017.
- C21. T. Batra, **G. Gohil**, N. Rodriguez, A. Sesham, and S. Bhattacharya “Isolation Design Considerations for Medium Voltage (10 kV and Above) Silicon Carbide Device Gate Drivers, ”in *Proc. of the IEEE Energy Conversion Congress and Exposition*, ECCE 2017, Oct 2017.
- C22. R. Chattopadhyay, **G. Gohil**, and S. Bhattacharya “Optimized Design for Split-Winding Type Three Limb Core Based Three Port High Frequency Transformer with Leakage Inductance and Inter-Winding Capacitance Evaluation, ”in *Proc. of the IEEE Energy Conversion Congress and Exposition*, ECCE 2017, Oct 2017.
- C23. U. Raheja, **G. Gohil**, and S. Bhattacharya “Applications and Characterization of Four Quadrant GaN Switch, ”in *Proc. of the IEEE Energy Conversion Congress and Exposition*, ECCE 2017, Oct 2017.

- C24. V. Iyer, S. Guler, **G. Gohil**, and S. Bhattacharya “Extreme Fast Charging Station Architecture for Electric Vehicles with Partial Power Processing,” *in Proc. of the IEEE Applied Power Electronics Conference and Exposition*, APEC, Mar 2018.
- C25. A. Anurag, S. Acharya, Y Prabowo, **G. Gohil**, H. Kassa, and S. Bhattacharya “An Accurate Calorimetric Method for Measurement of Switching Losses in Silicon Carbide (SiC) MOSFETs,” *in Proc. of the IEEE Applied Power Electronics Conference and Exposition*, APEC, Mar 2018.
- C26. R. Chattopadhyay, **G. Gohil**, S. Acharya, V. Nair, and S. Bhattacharya “Efficiency Improvement of Three Port High Frequency Transformer Isolated Triple Active Bridge Converter,” *in Proc. of the IEEE Applied Power Electronics Conference and Exposition*, APEC, Mar 2018.
- C27. R. Chattopadhyay, U. Raheja, **G. Gohil**, V. Nair, and S. Bhattacharya “Sensorless Phase Shift Control for Phase Shifted DC-DC Converters for Eliminating DC Transients from Transformer Winding Currents,” *in Proc. of the IEEE Applied Power Electronics Conference and Exposition*, APEC, Mar 2018.

Research Work

Combined PV/battery Grid Integration - Postdoctoral Researcher, NCSU *June, 2016 - Present*

Research Efforts:

- Topology selection for SiC based PV/battery grid integration.
- Transformer-less utility scale PV system design using SiC (including MV 10 kV) devices.
- Magnetic material characterization and medium frequency transformer design.
- Hardware prototype development, including PCB design, gate driver design, and controller programming.
- System integration issues (Real-time HIL simulations).

Solid State Transformers (SST) for Mobile Utility Support Equipment (MUSE) - Postdoctoral Researcher, NCSU *Jan, 2017 - Present*

Research Efforts:

- System design for 100 kVA, 4.18 kV / 480 V solid state transformer.
- Characterization of 10 kV and 1.2 kV SiC MOSFETs (using electrical and calorimetric measurement).
- Medium frequency transformer design with special emphasis on reducing the parasitic capacitances.
- Gate driver design for 10 KV and 1.2 kV SiC MOSFET with focus on common-mode reduction and short circuit (De-saturation) protection.
- Hardware prototype development, including Busbars, PCB design, and controller programming.

High power density DC-DC converter using GaN Four Quadrant Switch (FQS) - Postdoctoral Researcher, NCSU *June, 2016 - Present*

Research Efforts:

- Optimized single-stage AC/DC converter design using multi-objective optimization approach.
- Characterization of the GaN FQS.

- Hardware prototype development.

System Stability Analysis - *Postdoctoral Researcher, AAU*

Dec, 2015 - June 2016

Research Efforts:

- Analysis of parallel converters and its stability in micro-grid environment.

Parallel interleaved voltage source converters for grid integration of high power renewable sources - *Doctoral Thesis*

May, 2013 - Dec 2015

Challenges

- A circulating current flows through the closed path due to the control asymmetry and the impedance mismatch. When the carriers are interleaved, the switched output voltages of the interleaved parallel legs are phase shifted. Therefore, there exists a potential difference, which further increases the circulating current.
- Flow of the circulating current would result in increased losses and unnecessary over-sizing of the components present in the circulating current path. Therefore, the circulating current should be suppressed to realize the full potential of the interleaved carriers in parallel connected VSCs.

Contributions

- PWM schemes for parallel interleaved VSCs
 - Analysis of the conventional PWM schemes for parallel interleaved VSCs.
 - Reduced common mode voltage PWM schemes for parallel interleaved VSCs.
 - A novel PWM scheme for the size reduction of the circulating current filter.
 - An optimized PWM scheme for the harmonic quality improvement.
- Filters for parallel interleaved VSCs
 - Analysis of the common mode inductor and the coupled inductor for circulating current suppression.
 - Novel integrated inductor for parallel interleaved VSCs.
 - Five limb integrated inductor and PWM scheme for flux reduction.
 - Techniques for the Size reduction of the integrated inductor in high power energy conversion systems.
 - Integrated inductor for parallel VSCs, connected in a whiffletree configuration.

Soft-grid (hybrid AC-DC Micro-grid) - *Siemens AG*

Jan, 2012 - Oct, 2012

Features:

- Flexible Low Voltage DC inter-connection
- Use of Local storage and communication for stable operation

Responsibilities:

- Topology Comparison and Selection of Power Electronics Converter.
- Simulation of Power Electronics Converters and Micro-Grid.
- Design, Optimization, and fabrication of Isolated Bi-directional DC-DC Converter.
- Control using TMS320F28069 Digital Signal Processor (DSP).
- ZigBee and PLC Communication.
- Protection Issues.

Solar UPS - *Crompton Greaves Ltd.*

July, 2011 - Jan, 2012

Features:

- Controlled PV power generation for controlled battery charging.

Responsibilities:

- Optimal Storage Sizing.
- DC-DC converter and three-level inverter design.
- Simulation and control implementation using TMS320F28335.

Three phase D-STATCOM - *Crompton Greaves Ltd.*

July, 2011 - Jan, 2012

Features:

- Var Compensation.
- Active filter operation – Compensation upto 13th Harmonic.
- Ratings: 100 KVA, 200 KVA & 500KVA.

Responsibilities:

- System simulations.
- Controller design and Implementation using TMS320F2812.

Load Balancer - *Crompton Greaves Ltd.*

July, 2011 - Jan, 2012

Features:

- Designed for welding load application for automobile industry.
- Help reducing the fuel consumption of Diesel Generator.
- Faster control for fast changing Welding loads.

Responsibilities:

- Simulation Study, Controller Design and Control Algorithm implementation using TMS320F2812.

Design and fabrication of Auxiliary Power Support System for Back-up and Transient Stability in a Micro-Grid Environment using Fuel Stack and Ultra Capacitor
- *IIT, Bombay*

June, 2010 - July, 2011

Features:

- Supply or receive power (both active and Reactive) during grid connected mode as directed by the Master controller.
- Detect the Islanding condition and Maintain stability during Islanded mode of Micro-Grid operation by maintaining the Load-Generation balance.
- Can provide stable reference for other distributed sources which are feeding power to Micro-Grid in a current controlled mode during islanded mode of operation.
- Maintain reliable power quality in case of isolation of Micro-Grid system from Utility.

Responsibilities:

- Modeling and design of three phase Voltage Source Inverter, dc/dc boost converter (FC converter), dc/dc buck-boost converter (UC converter).
- Design an intelligent control strategy for coordinated power distribution between Fuel cell and Ultra capacitor.

References

- Prof. Frede Blaabjerg
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