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- EXPERTISE Power Electronics, Power Systems, Control Systems, Renewable Energy, Energy Conversion
- APPOINTMENTS **University of Texas at Austin**, Department of Electrical Engineering, Austin, TX
Assistant Professor, Fall 2022 – Present
- EDUCATION **University of Illinois at Urbana-Champaign**, Urbana, Illinois
Ph.D., Electrical and Computer Engineering, May 2013
M.S., Electrical and Computer Engineering, December 2009
Texas State University, San Marcos, Texas
B.S., Physics, and B.M., Music, May 2008
- JOURNAL & [33] O. Ajala, N. Baeckeland, B. Johnson, S. Dhople, and A. Domínguez-García, “Model
MAGAZINE reduction and dynamic aggregation of grid-forming inverter networks,” in *IEEE Transactions*
ARTICLES *on Power Systems*, 2022. (Accepted)
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- [48] D. Venkatramanan, N. Vamanan, B. Johnson, and S. Dhople, “Quantitative analysis of third-harmonic neutral-point current, its impacts, and mitigation in three-level NPC inverters” in *Proc. Energy Conversion Congress and Exposition*, 2021.
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- [46] S. Dutta, B. Majmunović, S. Mukherjee, R. Mallik, G. Seo, D. Maksimović, and B. Johnson, “A novel decentralized PWM interleaving technique for ripple minimization in series-stacked DC-DC converters,” in *Proc. Applied Power Electronics Conference*, 2021.
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- [42] P. Chandran, B. Rose, B. Johnson, “Equivalent circuit models for closed-loop multiphysics drive systems,” in *Proc. Workshop on Control and Modeling of Power Electronics*, 2020.
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- [40] M. Lu, V. Purba, S. Dhople, and B. Johnson, “Comparison of droop control and virtual oscillator control realized by Andronov-Hopf dynamics,” in *Proc. Conference of the Industrial Electronics Society*, 2020.
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- [3] B. Johnson, P. Krein, and P. Chapman, “Photovoltaic ac module composed of a very large number of interleaved inverters,” in *Proc. IEEE Applied Power Electronics Convention*, 2011, pp. 976–981.
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- [1] B. Johnson, A. Davoudi, P. Chapman, and P. Sauer, “Microgrid dynamics characterization using the automated state model generation algorithm,” in *Proc. IEEE International Symposium on Circuits and Systems*, 2010, pp. 2758–2761.

TEACHING
EXPERIENCE

[**Spring 2023**], ECE 394J-11: *Advanced Power Electronics*, University of Texas at Austin, Department: Electrical and Computer Engineering.
 [**Fall 2022**], ECE 462L: *Power Electronics Laboratory*, University of Texas at Austin, Department: Electrical and Computer Engineering.
 [**Autumn 2020**], EE 559: *Advanced Power Electronics*, University of Washington, Department: Electrical and Computer Engineering.
 [**Spring 2020**], EE 453: *Electric Drives*, University of Washington, Department: Electrical and Computer Engineering.
 [**Winter 2019, Winter 2020, Winter 2021**], EE 458: *Power Electronics Controls*, University of Washington, Department: Electrical and Computer Engineering.
 [**Autumn 2018, Autumn 2019, Autumn 2021**], EE 452: *Power Electronics Design*, University of Washington, Department: Electrical and Computer Engineering.
 [**Spring 2019**], EE 534: *Converters in Power Systems*, University of Washington, Department: Electrical and Computer Engineering.
 [**Autumn 2016, Autumn 2017**], ECEN 5008: *Power Systems Analysis and Control*, University of Colorado Boulder, Department: Electrical, Computer, and Energy Engineering.

GRANTS

[**Co-PI**], “**Universal Interoperability for Grid-Forming Inverters (UNIFI) Consortium**,” Department of Energy – Solar Energy Technologies Office, 2022–2027, Amount: \$25,000,000.
 [**PI**], “A Unified Multiphysics Approach for Modeling, Control, and Optimization of Wave Energy Converters,” Department of Energy – Water Power Technologies Office, 2021–2025, Award # DE-EE0009446, Amount: \$1,500,000.
 [**PI**], “A Scalable Control Architecture for 100% PV Penetration with Grid Forming Inverters,” Department of Energy – Solar Energy Technologies Office, 2020–2023, Grant # DE-EE0009025, Amount: \$4,913,338.
 [**PI**], “Modular Wide-Bandgap String Inverters for Low-Cost Medium-Voltage Transformerless PV Systems,” Department of Energy – Solar Energy Technologies Office, Sept. 2018–Aug. 2021, Award # DE-EE0008346.0000, Amount: \$2,837,106.

- [**Co-PI**] “Marine Energy Converter Scalability,” Naval Facilities Engineering Command, April 2018–March 2021, Order # N0002418F8702, Amount \$230,000.
- [**PI**], “Wide-Bandgap Modular Architectures for Medium Voltage Energy Conversion in Utility-Scale Wind and Solar,” National Renewable Energy Laboratory: Lab Directed R&D, Oct. 2017–Sept. 2019, Team Members: NREL (lead), University of Colorado Boulder, Amount: \$400,000.
- [**PI**], “Stabilizing the Power System in 2035 and Beyond: Evolving from Grid-Following to Grid-Forming Distributed Inverter Controllers,” Department of Energy –Solar Energy Technologies Office, Oct. 2015–Sept. 2018, Grant # DE-EE0000-1583, Amount: \$3,849,999.
- [**PI**], “Optimal Inverter Dispatch: Facilitating High PV Penetration with Optimization and Grid Informatics,” National Renewable Energy Laboratory: Lab Directed R&D, Oct. 2014–Sept. 2016, Amount: \$385,774.
- [**Key Personnel**], “A Robust Distributed Framework for Flexible Power Grids,” Department of Energy – ARPA-E, Spring 2016–Spring 2018, Team Members: University of Minnesota (lead), NREL, University of Tennessee, DynaPower LLC, Amount: \$2,950,000.
- [**Key Personnel**], “Community Control of Distributed Resources for Wide Area Reserve Provision,” Department of Energy – Grid Modernization Laboratory Consortium, Spring 2016–Spring 2018, Collaborators: Lawrence Berkeley National Lab (lead), Sandia, Riverside Public Utility, Smarter Grid Solutions, Amount: \$3,250,000 (\$500,000 NREL share).

PATENTS

- S. Mukherjee, B. Majmunovic, D. Maksimović, B. Johnson, “Planar transformers with interleaved windings and high voltage isolation,” US Patent Application #(17/839,924), 2022.
- D. Maksimović, P. Achanta, B. Johnson, M. Rodriguez, V. Gevorgian, “Modular scalable power conversion,” US Patent #(10,855,203), 2020.
- B. Johnson, S. Dhople, N. Ainsworth, F. Dörfler, “Virtual oscillator control,” U.S. Patent #(10,528,687), 2020.
- P. Krein, B. Johnson, S. Dhople, and A. Hamadeh, “Virtual oscillator control of power electronic inverters,” U.S. Patent # (9,484,745), 2016.
- B. Johnson, P. Krein, A. Lentine, “Microinverters for employment in connection with photovoltaic modules,” Sandia National Laboratories, U.S. Patent # (9,143,053), 2015.
- B. Johnson, P. Krein, and P. Chapman, “Inverter array with localized inverter control,” SolarBridge Technologies, U.S. Patent # (8,842,454), 2014.

HONORS AND AWARDS

- National Science Foundation CAREER Award (2022-2027)
- Best Paper Award – IEEE Transactions on Energy Conversion (2019)
- NREL Outstanding Mentor Award (2015, 2016, 2017)
- NREL Chairman’s Award for Exceptional Performance (2013)
- National Science Foundation Graduate Research Fellowship (2010-2013)
- University of Illinois Graduate College Fellowship (2008-2010)
- Support for Under-Represented Groups in Engineering Fellowship (2008-2010)
- Outstanding Presentation Award – Applied Power Electronics Conference (2011)
- Outstanding Graduating Physics Major (2008)
- Houston Louis Stokes Alliance for Minority Participation Scholarship (2006-2008)

SERVICE

Editorial Experience:

- Associate Editor for *IEEE Transactions on Energy Conversion* (2016–present)
- Associate Editor for *IEEE Transactions on Power Systems Letters* (2019–present)
- Guest Editor-in-chief for *IEEE Transactions on Energy Conversion* Special Issue: Power Conversion and Control in Photovoltaic Power Plants (2019)
- Guest Editor for *IEEE Transactions on Energy Conversion* Special Issue: Advanced Distributed Control of Energy Conversion Devices and Systems (2015)

Conference and Workshop Service:

- Co-organizer of “Special Session on Grid-forming Inverters in Future Power Systems” in *Industrial Electronics Conference* (2020)
- Lead Organizer of Workshop on “Grid-forming Inverters for Low-inertia Power Systems,” University of Washington campus, Seattle, WA (2019)
- Chair for “Power Electronics and Grid Integration” Topic Area: *Photovoltaic Specialists Conference* (2019)
- Chair for “Distributed Resources and Microgrids” Topic Area: *Energy Conversion Conference and Congress* (2019)
- Technical Program Committee: *IEEE Workshop on Control and Modeling for Power Electronics (COMPEL)* (2015)
- Session Chair: *IEEE Power and Energy Conference at Illinois* (2011, 2012)
- Volunteer Coordinator: *IEEE Energy Conversion Conference and Exposition* (2013)

PROFESSIONAL
EXPERIENCE

University of Washington, Department of Electrical Engineering, Seattle, WA
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