

Annette R. von Jouanne, Ph.D., P.E., IEEE Fellow

Professor of Energy Systems:

Power Electronics, Power Systems, Renewables, Motors and Drives
Baylor University, Department of Electrical and Computer Engineering
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Professional Preparation

Ph.D. Electrical Engineering/Power Electronics, Texas A&M University, College Station, TX 1995
M.S. Electrical Engineering/Power Systems, Southern Illinois University, Carbondale, IL 1992
B.S. Electrical Engineering with Math Minor, Southern Illinois University, Carbondale, IL 1990

Appointments

- Professor, Baylor University, Department of Electrical and Computer Engineering, 2017-present
- Professor, Oregon State University, School of Electrical Engineering and Computer Science (EECS), June 2004 - 2017
- Associate Professor, Oregon State University, Department of Electrical and Computer Engineering, June 2000 – June 2004
- Assistant Professor, Oregon State University, Department of Electrical and Computer Engineering, September 1995 - June 2000
- Post Doctoral Research Associate, Texas A&M University, Department of Electrical Engineering, College Station, TX, June - August 1995
- Engineering Assistant, Advanced Motor/Drive Technical Development, Toshiba Industrial Division, Houston, TX, June 1993 - August 1995

Research: Power Electronics, Power Systems, Renewables including significant contributions to Wave Energy, Variable Frequency Drive Systems and Application Issues, Electric Motors and Drives, Electric Vehicles (EVs) and Hybrid Electric Vehicles (HEVs), Navy All-Electric Ship, Electrified Aviation, Electric Propulsion in Sustainable Transportation.

Sample of Recent Research Projects: Total = \$33,984,247 My Portion = \$11,961,894

- **PI, Navy (ONR)**, “Optimized Four-leg Inverter for Advanced SiC Motor Drive Applications with CM Voltage Elimination, Zero Damaging EDM Bearing Currents and Full Torque Capabilities”, \$300,000, July 2024 – June 2026.
- **Co-PI, STTR (DOD)**, “Microscale Onboard Integrated Condition Assessment”, with Fathom5, Baylor Portion \$330,000, 2024-2025.
- **Co-PI, Navy (ONR)**, “Insulation Life Prediction for Silicon Carbide (SiC) Motor-Drive Systems”, \$300,000, May 2023 – April 2025.
- **Postdoctoral Award**, \$142,500, June 2022 – May 2025.

Completed Research Contracts During Time at Baylor (since Aug. 2017):

- **PI, Navy (ONR)**, “Development of Advanced Inverter Duty Motor Bearings for SiC Applications”, \$300,000.
- **PI, Navy (ONR)**, “Advancement of CM, EMI and Motor Bearing Compatibility Solutions in Support of PEPDS and SiC Applications”, \$200,000.
- **Co-PI, ARPA-E**, “Converting Natural Gas to Liquid Fuels by Low Energy Electrical Corona Discharge Processes”, \$2,421,497, 2 post docs, 3 GRAs, 4 Co-PIs, (my portion \$300k).
- **PI, Navy (ONR)**, “Motor Bearing Characterization in SiC-based Variable Frequency Drive Applications”, \$100,000.
- **PI, Navy (NSWC)** Naval Surface Warfare Center, “Variable Frequency Drive Application Issues”, \$24,930 (2019) and \$24,930 (2018).

Currently Under Review: USDOE EERE (\$2.5M), ARPA-E STTR (\$1.875M), NREL (\$80k)

Teaching: Power Electronics and Renewable Energy Integration, Power Systems, Electric and Hybrid Electric Vehicles, Variable Frequency Drive systems, Engineering Analysis (Freshman, Digital Logic, Matlab, Microcontrollers), Circuit Theory and Laboratory, Conventional and Alternative Energy Systems.

Advising: Graduated 17 Ph.D. and 43 Masters Students, Supervised 5x Postdoc Scholars. Currently advising 2 Ph.D., 2 M.S., 3 Undergrad Researchers, 1 Postdoc, 1 Visiting Scholar.

Synergistic Activities

- Director and Founder of the Baylor Energy and Renewable Systems Laboratory.
- Have taught 20 Industrial Short Courses on Energy, Power Electronics and Drive Systems.
- 5x Patents and Appl., 15x Invention Disclosures (2023 patent, working with Co. for product dev.).
- Conducting research on SiC variable frequency drive application issues and GaN Systems.
- Hardware-in-the-loop (HIL) testbed developments.
- Electric and hybrid vehicle chassis dynamometer testbed, power analysis, battery modeling and performance optimization, fast charging and bidirectional charging, data acquisition, autonomous capabilities.
- Initiated the Wave Energy program at OSU in 1998, developed into a \$13.5M internationally recognized multidisciplinary program (NNMREC – Northwest National Marine Renewable Energy Center).

Recent Selected Publications (of 75 Journal papers, 191 Conference papers, 5 Patents and Applications)

1. Tingke Fang, Coleman Vairin, A. von Jouanne, E. Agamloh, A. Yokochi, "Review of Fuel Cell Electric Vehicles", *Energies Journal*, May 2024.
2. J. Adegbohun, A. von Jouanne, E. Agamloh, A. Yokochi, "A Review of Bidirectional Charging Grid Support Applications and Battery Degradation Considerations", *Energies Journal*, March 2024.
3. Caleb Li, Annette von Jouanne, Giovanna Oriti, Alex Julian, Emmanuel Agamloh, Alex Yokochi, "GaN Four-leg Inverter Implementing Novel Common Mode Elimination using a Hardware-in-the-loop System-Level Controller", *IEEE Trans. on Industry Applications*, July 2023. (Adv. from ECCE 2022)
4. J. Adegbohun, A. von Jouanne et al., "Geographical Modeling of Charging Infrastructure requirements for Heavy-Duty Electric Autonomous Truck Operations", *Energies Journal*, 2023.
5. Junhui Lou, Solomon C. Yim, Annette von Jouanne, "Dynamic Mooring Field Experiment and Design of a Wave Energy Converter (WEC) Platform Test System", *Journal of Offshore Mechanics and Arctic Engineering (OMAE)*, February 2023.
6. Annette von Jouanne, Emmanuel Agamloh, Alex Yokochi, Power Hardware-in-the-Loop (PHIL): A Review to Advance Smart Inverter-Based Grid-Edge Solutions, *Energies Journal*, January 2023
7. Ryan Collin, Annette von Jouanne, Alex Yokochi, "EDM Damage Assessment and Lifetime Prediction of Motor Bearings Driven by PWM Inverters", *ECCE*, 2022. **ECCE 2022 Prize Paper Award.**
8. Ryan Collin, Annette von Jouanne, Alex Yokochi, "Novel Characterization of Si- and SiC-based PWM Inverter Bearing Currents Using Probability Density Functions", *Energies Journal*, 2022.
9. Annette von Jouanne, Ryan Collin et al., "Development of Inverter Duty Motor Bearings for Si- and SiC-Based Variable Frequency Drive Applications Including Advanced 4D Finite Element Modeling", *ECCE*, 2021.
10. Junhui Lou, Solomon Yim, Josh Baker, Ean Amon, Annette von Jouanne, "Field Test Study and Quasi-Static Analysis of Global Characteristics and Survivability of a Wave Energy Converter Test Platform Mooring System", *Journal of Ocean Engineering and Marine Energy*, 2020.
11. J. Adegbohun, A. von Jouanne, B. Phillips, E. Agamloh, A. Yokochi, High Performance Electric Vehicle Powertrain Modeling, Simulation and Validation, *Energies Journal*, March 2021.
12. Emmanuel Agamloh, Annette von Jouanne, Alex Yokochi, "An overview of electric machine trends in modern electric vehicles", *Machines Journal*, April 2020, 8(2), 20; doi:10.3390/machines8020020.

13. Annette von Jouanne, Ryan Collin, Madeline Stephens, Brian Thayil, Caleb Li, Emmanuel Agamloh, Alex Yokochi, "Motor Bearing Current Characterization in SiC-based Variable Frequency Drive (VFD) Applications", ECCE, Detroit, Oct. 2020.
14. Annette von Jouanne, Jimi Adegbohun, Ryan Collin, Madeline Stephens, Brian Thayil, Caleb Li, Emmanuel Agamloh, Alex Yokochi, "Electric Vehicle Benchmarking using a Chassis Dynamometer Test Bed with On-Board Diagnostics Data Capture", ECCE, Detroit, Oct. 2020.
15. Ryan Collin, Madeline Stephens, Annette von Jouanne, "Development of SiC-Based Motor Drive Using Typhoon HIL 402 as System-Level Controller", ECCE, Detroit, October, 2020.
16. Collin, R.; Miao, Y.; Yokochi, A., Enjeti, P.; von Jouanne, A., "Advanced Electric Vehicle Fast-Charging Technologies", *Energies Journal* 2019.
17. Miao, Y.; Hynan, P.; von Jouanne, A.; Yokochi, A., Current Li-Ion Battery Technologies in Electric Vehicles and Opportunities for Advancements, *Energies Journal* 2019. **Energies Journal Best Paper of 2019 Award, Awarded in April 2021 after citation accumulation.**
18. J. Adegbohun, A. von Jouanne, K. Lee, "Autonomous Battery Swapping System and Methodologies of Electric Vehicles", *Energies Journal* 2019.
19. Annette von Jouanne, Alex Yokochi, "Variable Frequency Drive Application Issues", Short Course Manual for the Naval Surface Warfare Center (NSWC), March 2019.
20. Annette von Jouanne, Ryan Collin, Scott Harpool, Adam Shareghi and Alex Yokochi, "Power Electronics Testbed for Converting Methane to Liquid Fuels via Electrical Corona", IEEE ECCE 2018, Sept. 23rd – 27th, Portland, OR.
21. A. von Jouanne, T. Brekken, "Ocean and Geothermal Energy Systems", *Power Electronics in Smart Grid and Renewable Energy Systems*, Proceedings of the IEEE Special Issue, 2017.
22. T. Lettenmaier, A. von Jouanne, T. Brekken, "A New Maximum Power Point Tracking Algorithm for Ocean Wave Energy Converters", *Elsevier International Journal of Marine Energy*, 2017.
23. A. von Jouanne, T. Brekken, et al., Advancing the Wave Energy Industry, *IEEE Potentials*, JANUARY/FEBRUARY 2015 issue, Vol. 34, pages 41-47.

Awards & Honors

- Top 2% most cited researcher in higher ed history in the world. (latest Stanford database)
- Nine Prize Paper Awards.
- ECCE 2022 Prize Paper Award, Awarded October 2023 at ECCE 2023.
- *Energies Journal* Best Paper of the Year Award for 2019, Awarded April 2021.
- OSU College of Engineering Research Award, 2014.
- National Sea Grant Research to Application Award, 2012.
- Top 12 contemporary Oregon innovators (125 Oregon innovators were nominated), 2011.
- OSU Impact Award for Outstanding Scholarship, 2010.
- OSU College of Engineering Research Collaboration Award, 2009.
- "OMSI Genius Award" for Wave Energy Pioneering Work, 2009.
- IEEE Fellow, Elected November 2008, for "contributions to ocean wave energy systems."
- International Ocean Energy Conference "Ocean Energy Pioneer Award", 2007.
- OSU College of Engineering Alumni Professor Award, 2007.
- "Most Enthusiastic Professor Award", voted on by the Students in the School of EECS, 2007.
- "Professor of the Year Award", voted on by the Students in the School of EECS, 2003-2004.
- IEEE-Industry Applications Society (IAS) Outstanding Young Member Award, 2000.
- Selected by NAE to be profiled as one of the NAE's "Celebrated Women Engineers", 1999.
- OSU College of Engineering Engelbrecht Young Faculty Award, 1998.
- NSF CAREER Award, 1998.