Juntao Yao (U.S. Permanent Resident)

juntao.yao@outlook.com

Versatile in EMC, electronics, simulations, and experiment automation

Mobile: (+1) 669-290-5629

Education

- PhD, Electrical Engineering, University of Florida, 2017-2021, Advisor: Dr. Shuo Wang
  Thesis: Modeling and Reduction of Radiated Electromagnetic Interference in Power Converters
- MS, Electrical Engineering, Wuhan University, 2013-2016, Advisor: Dr.Fei Liu & Dr.Xiaoming Zha
  Thesis: Coordination Control of DC Microgrids with Photovoltaic and Battery
- BS, Electrical Engineering, Wuhan University, 2009-2013, GPA 3.66/4 (89/100), Ranking 22/392
  Thesis: Compound Controller Design for Active Power Filters

Skills

- **EMC in Electronics**, power / consumer / automotive electronics, EMC compliance design (emissions, BCI, radiated immunity, transient immunity, and ESD), with expertise in developing solutions involving semiconductors, transformers, grounding, shielding, filters, and layouts
- **Power Integrity (PI)** analysis, simulation, and optimization covering PDN, voltage regulators, package, PCB, and components
- **RF and Microwave**, antenna theory, transmission line, scattering parameters
- **Electromagnetic Simulation** in ANSYS HFSS, SIwave, CST, and ADS
- **Circuit Simulation** in LTSpice, MATLAB Simulink, Saber, PSIM, and SIMPLIS
- **PCB Design** with Altium Designer and Allegro
- **Hands-on** with VNA, impedance analyzer, spectrum analyzer, power analyzer, and oscilloscope
- **Programming** in Python, MATLAB, C, and HTML web

Experience

Apple

- **Hardware Design Engineer** Jan. 2022 - Nov. 2024
  - Collaborated with SIPI / HW / SW to optimize performance, cost, and EMC
  - Designed EMC in high-speed / low-speed interfaces, and validated compliance
  - Designed EMC in power converters and compute modules
  - Simulated resonance and power dissipations, and developed mitigation strategies
  - Optimized size and cost in EMC design, and validated in simulations and experiments
  - Developed Python-based automation with oscilloscope, signal generator, spectrum analyzer
- **PhD Intern** May. 2021 - Sep. 2021
  - Built 3D EM simulation models of filter and PCB, and investigated coupling mitigations
  - Investigated component non-linear characteristics and the impact on EMI
  - Predicted EMI based on noise source and filter modeling and simulations

University of Florida, Power Electronics and Electrical Power Lab, Research Assistant

- **EMI in Power Converters in Automotive Applications** Aug. 2018 - Apr. 2021
  Sponsored by ***Monolithic Power Systems, Inc. San Jose, CA, USA***
  - Developed EMI models of automotive DC-DC power converters including switching noise sources, components, PCB layouts, and antennas
  - Predicted EMI in automotive power converters
  - Developed and validated EMI solutions by circuit, component placement, and PCB layout optimizations, and near field coupling mitigations
- **Radiated EMI in GaN IC Active Clamp Flyback Power Adapters** Mar. 2018 - Oct. 2019
  Sponsored by ***Navitas Semiconductor, Inc. El Segundo, CA, USA***

- Developed radiated EMI models of GaN IC-based active clamp flyback power adapters
- Proposed radiated EMI solutions by shielding and grounding, filter, and layout optimizations
- Analyzed and mitigated near field couplings' impact on radiated EMI
- Built an ANSYS HFSS simulation model of a planar transformer

- **EMI in Flyback Power Adapters** Jan. 2017 - Dec. 2017
  - Developed conducted and radiated EMI models for flyback adapters including switching noise sources, transformers, EMI filters, and antennas
  - Investigated VNA characterization techniques for transformers, chokes, and antennas
  - Investigated transformer winding shielding, layer arrangement, and external component balancing techniques for EMI reduction

Wuhan University, Center for Grid Power Electronics, Research Assistant

- **Simulation and Experiment Platform of DC Microgrids** Sep. 2014 - June 2016
  - Designed the architecture and simulation model of a DC microgrid including grid-tied power converters, solar panels, batteries, and DC/DC power converters
  - Investigated the control strategy of power converters and the coordination strategy of the DC microgrid in grid-tied and standalone operation modes

- **Bidirectional Cascaded Multilevel Converter for Motor Drives** June 2013 - June 2015
  - Designed power cell configurations in a hybrid power converter consisting of unidirectional and bidirectional power cells
  - Analyzed the control strategy of cascaded H-bridge multilevel inverters

- **Shunt Active Power Filter** Nov. 2012 - Aug. 2013
  Bachelor thesis (Province-wide honor)
  - Proposed a multi-internal-model based controller robust to grid frequency fluctuation
  - Built a simulation model of an active power filter

Publications, Selected

(Over 30 technical papers published in transactions / journals / conferences.)

1. **J. Yao**, S. Wang, and Z. Luo, "Modeling, Analysis, and Reduction of Radiated EMI Due to the Voltage across Input and Output Cables in an Automotive Non-isolated Power Converter," IEEE Transactions on Power Electronics, vol. 37, no. 5, pp. 5455-5465, 2022.
2. **J. Yao**, Y. Li, S. Wang, X. Huang, and X. Lyu, "Modeling and Reduction of Radiated EMI in a GaN IC-Based Active Clamp Flyback Adapter," IEEE Transactions on Power Electronics, vol. 36, no. 5, pp. 5440-5449, May 2021.
3. **J. Yao**, S. Wang, and H. Zhao, "Measurement Techniques of Common Mode Currents, Voltages, and Impedances in a Flyback Converter for Radiated EMI Diagnosis," IEEE Transactions on Electromagnetic Compatibility, vol. 61, no. 6, pp. 1997-2005, Dec. 2019.
4. **J. Yao**, A. McDowell, and J. Chiappe, "Modeling and Simulation of EMI Noise Source and Filter in Power Converters," in Apple Modeling and Simulation Conference, 2024.
5. **J. Yao**, S. Wang, and L. Du, "Modeling and Reduction of Radiated EMI in a Power Converter with Undesired Capacitive Couplings," in Apple Modeling and Simulation Conference, 2024.

Patents, Selected

(1 patent issued, 2 patents pending)

- S. Wang, **J. Yao**, and Y. Li, "Common Mode (CM) Electromagnetic Interference (EMI) Filters for Reducing Radiated EMI in Power Converters," U.S. Patent 11,356,011, 2022. (U.S. Patent, Issued)

Honors and Awards, Selected

- Nominee of the Alec Courtelis Award at the University of Florida, for research and academic excellence, supported by Prof. Shuo Wang and Prof. Hitomi Yamaguchi Greenslet, and nominated by the College of Engineering, 2021
- Best Presentation Award, Applied Power Electronics Conference (APEC), 2021
- Exceptional Bachelor Thesis in Hubei Province, China (Top 2%), 2013
- Honorable Mention, USA Mathematical Contest in Modeling/Interdisciplinary Contest in Modeling (USA ICM/MCM), 2012