Mr. Juntao YAO

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PhD Candidate, Focusing on Power Electronics and EMI/EMC Solutions 001-3523285405

Research Assistant, Power Electronics and Electrical Power Research Lab (PEEPRL),

Address: 111, Larsen Hall, ECE Department, University of Florida, Gainesville, FL, 32611

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: Operational Control for Photovoltaic and Battery based DC Microgrid
- BS, Electrical Engineering, Wuhan University, 2009-2013, GPA 3.66/4 (89/100), Ranking 22/392
  Thesis: Compound Repetitive Control for LCL-filter based Active Power Filter

Skills

- **EMI Solutions for Power Electronics Systems** including conducted and radiated EMI in non-isolated and isolated power converters, in consumer electronics and automotive electronics, by improving the component (e.g. switching transformers, EMI filters) design and the PCB layout
- **Hardware**-PCB design in Altium Designer, design of switching power supplies and components, and testing using vector network analyzer, impedance analyzer, spectrum analyzer, power analyzer, oscilloscope, signal generator, etc.
- **Electromagnetic Simulation** in ANSYS Q3D, HFSS, and CST
- **Circuit Simulation** in Matlab Simulink, PSPICE, Saber, PSIM, and SIMPLIS
- **Programming** in Matlab, Code composer studio, Latex, and GitHub for web development

Research Experiences

Power Electronics and Electrical Power Research Lab (PEEPRL), University of Florida

- **EMI in Power Converters in Automotive Applications** Aug. 2018 -Present
  Sponsored by ***Monolithic Power Systems, Inc. San Jose, CA, USA***
  - Developed EMI models for automotive DC-DC power converters
  - Developed a virtual lab for EMI predictions
  - Proposed EMI reduction solutions

- **Radiated EMI in GaN IC-based Active Clamp Flyback Adapters** Mar. 2018 - Oct. 2019
  Sponsored by ***Navitas Semiconductor, Inc. El Segundo, CA, USA***
  - Developed radiated EMI models for GaN IC-based active clamp flyback adapters
  - Built a finite element simulation model of a planar transformer
  - Analyzed and mitigated near field coupling's impact on the radiated EMI
  - Proposed radiated EMI solutions by improving shielding and EMI filter techniques, and PCB layouts

- **EMI in Flyback Power Adapters** Jan. 2017 - Dec. 2017
  - Developed conducted and radiated EMI models for flyback adapters
  - Improved the transformer winding structure for EMI noise reduction

Center for Grid Power Electronics, Wuhan University

- **Simulation and Experiment Platform of DC Microgrid** Sep. 2014 - June 2016
  - Built a simulation model including grid-connected converters, solar cells, batteries, and interface power converters
  - Designed the PCB layout of a grid connected converter

- **Bidirectional Cascaded Multilevel Converter for Motor Drives** June 2013 - June 2015
  - Designed power cell configurations for a hybrid power converter including unidirectional and bidirectional rectifiers
- **Shunt Active Power Filter** Nov. 2012 - Aug. 2013
  Bachelor thesis (Province-wide honor)
  - Built an APF simulation model with an LCL filter
  - Innovated a multi-internal-model based repetitive controller robust to frequency fluctuation

Selected Publications

(Over 10 technical papers have been published in IEEE transactions and conferences.)

Selected Journal Papers

1. **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, 2020.
2. **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.
3. **J. Yao**, S. Wang, and Z. Luo, "Modeling, Analysis, and Reduction of Radiated EMI in an Automotive Non-isolated Power Converter," submitted to IEEE Transactions on Power Electronics. (Under Review)

Selected Conference Papers

1. **J. Yao**, S. Wang and Z. Luo, "Near Field Coupling's Impact on Radiated EMI and Mitigation Techniques for Power Converters in Automotive Applications," in 2020 IEEE Energy Conversion Congress and Exposition (ECCE), 2020.
2. **J. Yao**, S. Wang and Z. Luo, "Radiated EMI Reduction by Layout Improvement in Power Converters in Automotive Applications," in 2020 IEEE 9th International Power Electronics and Motion Control Conference (IPEMC2020-ECCE Asia), 2020, pp. 1-6.
3. **J. Yao**, Y. Li, S. Wang, X. Huang, and X. Lyu, "Analysis and Reduction of Radiated EMI in High-Frequency GaN IC-based Active Clamp Flyback Converters," in 2020 IEEE Applied Power Electronics Conference and Exposition (APEC), 2020, pp. 664-671.
4. **J. Yao**, S. Wang and Z. Luo, "Modeling and Reduction of Radiated EMI in Non-isolated Power Converters in Automotive Applications," in 2020 IEEE Applied Power Electronics Conference and Exposition (APEC), 2020, pp. 385-392.

Selected Patent

1. S. Wang, **J. Yao** and Y. Li, "Common Mode (CM) Electromagnetic Interference (EMI) Filters for Reducing Radiated EMI in Power Converters," U.S. Patent, App. 63/083,698. (Pending, U.S. patent)

Honors and Awards

- Outstanding Master Graduate (Top 3%) , Wuhan University, 2016
- First-class Scholarship, Wuhan University, 2014
- Exceptional Bachelor Thesis in Hubei Province, China (Top 2%), 2013
- Outstanding Bachelor Graduate (Top 3%) , Wuhan University, 2013
- Honorable Mention, US Mathematical Contest in Modeling/Interdisciplinary Contest in Modeling (US ICM/MCM), 2012
- All-round Excellent Student (Top 5%), Wuhan University, 2012
- Exemplary Student Leader, Wuhan University, 2012
- National Encouragement Scholarship (Top 5%), 2012
- Third Prize in the National Electrical Mathematical Contest in Modeling, 2011
- Award for Creative Researcher, Wuhan University, 2011
- National Encouragement Scholarship (Top 5%), 2011