

YICHENG ZHU

📍 406 Cory Hall, Berkeley, CA 94720 ✦ 📞 (510) 206-4658
✉ yczhu@berkeley.edu ✦ 🏠 [Website](#) ✦ 🎓 [Google Scholar](#) ✦ 🌐 [Linkedin](#)

ACADEMIC POSITION

University of California, Berkeley Berkeley, CA, USA
Postdoctoral Scholar in the Department of Electrical Engineering and Computer Sciences July 2024 – Present

- Advisor: Professor Robert Pilawa-Podgurski [🔗](#)
- Fellowship: Bakar Fellows Program [🔗](#)

EDUCATION

University of California, Berkeley Berkeley, CA, USA
Doctor of Philosophy (Ph.D.) in Electrical Engineering and Computer Sciences Aug. 2020 – May 2024

- Advisor: Professor Robert Pilawa-Podgurski [🔗](#)
- Thesis: *High-Performance Hybrid Switched-Capacitor Power Converters: Circuit Topologies, Control Techniques, and Analytical Models* [🔗](#)

Tsinghua University Beijing, China
Master of Science (M.S.) in Electrical Engineering Sept. 2017 – July 2020

- Advisor: Professor Zhengming Zhao [🔗](#)
- Thesis: *Analysis and Control of SiC MOSFET Switching Transients*

Bachelor of Engineering (B.Eng.) in Electrical Engineering and Automation Aug. 2013 – June 2017

AWARDS AND HONORS

Fellowships and Scholarships

NVIDIA Graduate Fellowship [🔗](#) 2023 – 2024

- Awarded to 5 Ph.D. students worldwide involved in research that spans all areas of computing innovation.

Berkeley Fellowship [🔗](#) 2020 – 2022

- Awarded to outstanding Ph.D. applicants by UC Berkeley Graduate Division.

IEEE Power & Energy Society Outstanding Student Scholarship [🔗](#) May 2020

- Awarded to 5 PES student members worldwide.

Papers and Presentations

Best Paper Award: Open Compute Project Future Technologies Symposium [🔗](#) Oct. 2023

- Awarded to 1 paper in the Power and Server track.

Best Paper Award: IEEE 24th Workshop on Control and Modeling for Power Electronics [🔗](#) June 2023

- For conference paper [C15]. Awarded to 3 out of 84 accepted, peer-reviewed conference papers.

Teaching and Mentorship

Teaching Effectiveness Award [🔗](#) May 2024

- Awarded to 15 outstanding graduate student instructors (GSIs) university-wide by the UC Berkeley GSI Teaching and Resource Center.

Outstanding Graduate Student Instructor Award [🔗](#) Mar. 2024

- Awarded to up to 10% of the GSIs appointed by the Berkeley EECS department.

Academic Performance

Ross N. Tucker Memorial Award [🔗](#) Apr. 2024

- Awarded to 1 Ph.D. student department-wide in recognition of superior work and scholarship in the characterization, development and/or use of semiconductor, magnetic, optical or electronic materials.

Outstanding Tsinghua Master's Thesis Award	June 2020
• Awarded to 3 master's students department-wide.	
Graduate with Distinction (Masters Student)	June 2020
• Awarded to 2 master's students department-wide.	
Graduate with Distinction (Undergraduate Student)	June 2017
• Top 5% department-wide.	
Tsinghua Scholarship of Academic Excellence	
• Received in the Master's (2019, 2018), Senior (2016), Junior (2015), and Sophomore (2014) years.	

Research Competition

Grand Prize of the 34 th Tsinghua <i>Challenge Cup</i> Student Research Competition (Team leader)	Apr. 2016
• Awarded to 6 out of more than 300 student research teams across all departments at Tsinghua University.	


Leadership and Service

Tsinghua Outstanding Student Leader Award	Oct. 2016
---	-----------
















SELECTED PUBLICATIONS





Peer-Reviewed Journal Articles

- [J14] **Y. Zhu**, N. M. Ellis, and R. C. N. Pilawa-Podgurski, "Comparative Performance Analysis of Regulated Hybrid Switched-Capacitor Topologies for Direct 48 V to Point-of-Load Conversion," in *IEEE Open Journal of Power Electronics*, vol. 5, pp. 1735-1755, 2024. | [Link](#) 
- [J13] **Y. Zhu**, J. Zou, and R. C. N. Pilawa-Podgurski, "A 1500-A/48-V-to-1-V Switching Bus Converter for Next-Generation Ultra-High-Power Processors," in *IEEE Transactions on Power Electronics*, vol. 39, no. 9, pp. 11340-11355, Sept. 2024. | [Link](#) 
- [J12] **Y. Zhu**, T. Ge, N. M. Ellis, L. Horowitz, and R. C. N. Pilawa-Podgurski, "The Switching Bus Converter: A High-Performance 48-V-to-1-V Architecture with Increased Switched-Capacitor Conversion Ratio," in *IEEE Transactions on Power Electronics*, vol. 39, no. 7, pp. 8384-8403, July 2024. | [Link](#) 
- [J11] **Y. Zhu**, Z. Ye, and R. C. N. Pilawa-Podgurski, "Modeling and Analysis of Switched-Capacitor Converters With Finite Terminal Capacitances," in *IEEE Transactions on Power Electronics*, vol. 39, no. 6, pp. 6640-6653, June 2024. | [Link](#) 
- [J10] B. Shi, Z. Zhao, D. Tan, and **Y. Zhu**, "Integral Control of Megawatt Power Electronic Systems as Generalized Hybrid Systems," in *IEEE Journal of Emerging and Selected Topics in Power Electronics*, vol. 10, no. 4, pp. 4254-4274, Aug. 2022. | [Link](#) 
- [J9] B. Shi, Z. Zhao, J. Ju, Z. Yu, and **Y. Zhu**, "Switching Transient Simulation and System Efficiency Evaluation of Megawatt Power Electronics Converter With Discrete State Event-Driven Approach," in *IEEE Transactions on Industrial Electronics*, vol. 69, no. 3, pp. 2180-2190, Mar. 2022. | [Link](#) 
- [J8] B. Shi, Z. Zhao, **Y. Zhu**, Z. Yu, and J. Ju, "Discrete State Event-Driven Simulation Approach With a State-Variable-Interfaced Decoupling Strategy for Large-Scale Power Electronics Systems," in *IEEE Transactions on Industrial Electronics*, vol. 68, no. 12, pp. 11673-11683, Dec. 2021. | [Link](#) 
- [J7] B. Shi, Z. Zhao, **Y. Zhu**, and X. Wang, "Time-Domain and Frequency-Domain Analysis of SiC MOSFET Switching Transients Considering Transmission of Control, Drive, and Power Pulses," in *IEEE Journal of Emerging and Selected Topics in Power Electronics*, vol. 9, no. 5, pp. 6441-6452, Oct. 2021. | [Link](#) 
- [J6] Z. Yu, Z. Zhao, B. Shi, **Y. Zhu**, and J. Ju, "An Automated Semi-Symbolic State Equation Generation Method for Simulation of Power Electronic Systems," in *IEEE Transactions on Power Electronics*, vol. 36, no. 4, pp. 3946-3956, Apr. 2021. | [Link](#) 
- [J5] Y. Ling, Z. Zhao, and **Y. Zhu**, "A Self-Regulating Gate Driver for High-Power IGBTs," in *IEEE Transactions on Power Electronics*, vol. 36, no. 3, pp. 3450-3461, Mar. 2021. | [Link](#) 
- [J4] Z. Zhao, D. Tan, B. Shi, **Y. Zhu**, and H. Jin, "A Breakthrough in Design Verification of Megawatt Power Electronic Systems," in *IEEE Power Electronics Magazine*, vol. 7, no. 3, pp. 36-43, Sept. 2020. | [Link](#) 
- [J3] **Y. Zhu**, Z. Zhao, B. Shi, and Z. Yu, "Discrete State Event-Driven Framework with a Flexible Adaptive Algorithm for Simulation of Power Electronics Systems," in *IEEE Transactions on Power Electronics*, vol. 34, no. 12, pp. 11692-11705, Dec. 2019. | [Link](#) 
- [J2] B. Shi, Z. Zhao, and **Y. Zhu**, "Piecewise Analytical Transient Model for Power Switching Device Commutation Unit," in *IEEE Transactions on Power Electronics*, vol. 34, no. 6, pp. 5720-5736, June 2019. | [Link](#) 



[J1] X. Wang, Z. Zhao, K. Li, **Y. Zhu**, and K. Chen, “Analytical Methodology for Loss Calculation of SiC MOSFETs,” in *IEEE Journal of Emerging and Selected Topics in Power Electronics*, vol. 7, no. 1, pp. 71-83, Mar. 2019. | [Link](#) 

Peer-Reviewed Conference Proceedings

- [C21] **Y. Zhu**, J. Zou, and R. C. N. Pilawa-Podgurski, “Design-Oriented Modeling and Multi-Objective Optimization of Two-Phase Coupled Inductors in Multiphase PWM Converters,” in *Proc. IEEE Applied Power Electronics Conference and Exposition (APEC)*, Atlanta, GA, USA, Mar. 2025, accepted.
- [C20] J. Zou, **Y. Zhu**, N. M. Ellis, L. Horowitz, R. C. N. Pilawa-Podgurski, “A 48-V-to-1-V Gallium Nitride Switching Bus Converter for Processor Vertical Power Delivery with 2.7 mm Thickness and 3048 W/in³ Power Density,” in *Proc. IEEE Applied Power Electronics Conference and Exposition (APEC)*, Atlanta, GA, USA, Mar. 2025, accepted.
- [C19] **Y. Zhu**, J. Zou, N. M. Ellis, S. Kudva, M. Mosa, C. T. Gray, and R. C. N. Pilawa-Podgurski, “A Compact 48-V-to-Sub-1-V Switching Bus Converter with 4.7-mm Height for Processor Vertical Power Delivery,” to appear in *Proc. IEEE Energy Conversion Congress and Exposition (ECCE)*, Phoenix, AZ, USA, Oct. 2024, to be published.
- [C18] H. B. Sambo, **Y. Zhu**, and R. C. N. Pilawa-Podgurski, “A Merged ZCS/ZVS Control Technique for Resonant Switched-Capacitor Converters,” in *Proc. IEEE Energy Conversion Congress and Exposition (ECCE)*, Phoenix, AZ, USA, Oct. 2024, to be published.
- [C17] **Y. Zhu**, J. Zou, and R. C. N. Pilawa-Podgurski, “A 1500-A/48-V-to-1-V Switching Bus Converter for Next-Generation Ultra-High-Power Microprocessors,” in *Proc. IEEE Applied Power Electronics Conference and Exposition (APEC)*, Long Beach, CA, USA, Feb. 2024, pp. 890-897. | [Link](#) 
- [C16] **Y. Zhu**, N. M. Ellis, and R. C. N. Pilawa-Podgurski, “Comparative Performance Analysis of Regulated Hybrid Switched-Capacitor Topologies for Direct 48 V to Point-of-Load Conversion,” in *Proc. IEEE Energy Conversion Congress and Exposition (ECCE)*, Nashville, TN, USA, Oct. 2023, pp. 3313-3320. | [Link](#) 
- [C15] **Y. Zhu**, T. Ge, N. M. Ellis, J. Zou, and R. C. N. Pilawa-Podgurski, “A 48-V-to-1-V Switching Bus Converter for Ultra-High-Current Applications,” in *Proc. IEEE Workshop on Control and Modeling for Power Electronics (COMPEL)*, Ann Arbor, MI, USA, June 2023, pp. 1-8. | [Link](#)  [ **COMPEL 2023 Best Paper Award**]
- [C14] H. B. Sambo, **Y. Zhu**, and R. C. N. Pilawa-Podgurski, “Autotuning of Resonant Switched-Capacitor Converters for Zero Voltage Switching,” in *Proc. IEEE Workshop on Control and Modeling for Power Electronics (COMPEL)*, Ann Arbor, MI, USA, June 2023, pp. 1-8. | [Link](#) 
- [C13] N. Biesterfeld, **Y. Zhu**, R. K. Iyer, N. M. Ellis, and R. C. N. Pilawa-Podgurski, “Steady-State Analysis of Series-Capacitor Buck Converters in Discontinuous Capacitor Voltage Mode,” in *Proc. IEEE Workshop on Control and Modeling for Power Electronics (COMPEL)*, Ann Arbor, MI, USA, June 2023, pp. 1-6. | [Link](#) 
- [C12] **Y. Zhu**, T. Ge, N. M. Ellis, L. Horowitz, and R. C. N. Pilawa-Podgurski, “A 500-A/48-to-1-V Switching Bus Converter: A Hybrid Switched-Capacitor Voltage Regulator with 94.7% Peak Efficiency and 464-W/in³ Power Density,” in *Proc. IEEE Applied Power Electronics Conference and Exposition (APEC)*, Orlando, FL, USA, Mar. 2023, pp. 1989-1996. | [Link](#) 
- [C11] T. Ge, **Y. Zhu**, and R. C. N. Pilawa-Podgurski, “A Regulated Cascaded Hybrid Switched-Capacitor Converter with Soft-Charging and Zero Voltage Switching for 48-to-12-V Applications,” in *Proc. IEEE Applied Power Electronics Conference and Exposition (APEC)*, Orlando, FL, USA, Mar. 2023, pp. 1982-1988. | [Link](#) 
- [C10] H. B. Sambo, **Y. Zhu**, T. Ge, N. M. Ellis, and R. C. N. Pilawa-Podgurski, “Autotuning of Resonant Switched-Capacitor Converters for Zero Current Switching and Terminal Capacitance Reduction,” in *Proc. IEEE Applied Power Electronics Conference and Exposition (APEC)*, Orlando, FL, USA, Mar. 2023, pp. 1217-1224. | [Link](#) 
- [C9] **Y. Zhu**, T. Ge, Z. Ye, and R. C. N. Pilawa-Podgurski, “A Dickson-Squared Hybrid Switched-Capacitor Converter for Direct 48 V to Point-of-Load Conversion,” in *Proc. IEEE Applied Power Electronics Conference and Exposition (APEC)*, Houston, TX, USA, Mar. 2022, pp. 1272-1278. | [Link](#)  [ **APEC 2022 Student Travel Award**]
- [C8] **Y. Zhu**, Z. Ye, T. Ge, and R. C. N. Pilawa-Podgurski, “Multi-Resonant Compensation Control for Terminal Capacitance Reduction in Resonant Switched-Capacitor Converters,” in *Proc. IEEE Workshop on Control and Modeling for Power Electronics (COMPEL)*, Cartagena, Colombia, Nov. 2021, pp. 1-6. | [Link](#) 
- [C7] **Y. Zhu**, Z. Ye, and R. C. N. Pilawa-Podgurski, “Modeling and Analysis of Resonant Switched-Capacitor Converters with Finite Terminal Capacitances,” in *Proc. IEEE Workshop on Control and Modeling for Power Electronics (COMPEL)*, Cartagena, Colombia, Nov. 2021, pp. 1-6. | [Link](#) 
- [C6] **Y. Zhu**, Z. Ye, T. Ge, R. Abramson, and R. C. N. Pilawa-Podgurski, “A Multi-Phase Cascaded Series-Parallel (CaSP) Hybrid Converter for Direct 48 V to Point-of-Load Applications,” in *Proc. IEEE Energy Conversion Congress and Exposition (ECCE)*, Vancouver, BC, Canada, Oct. 2021, pp. 1973-1980. | [Link](#) 
- [C5] **Y. Zhu**, Z. Ye, and R. C. N. Pilawa-Podgurski, “Modeling and Analysis of Switched-Capacitor Converters with Finite Terminal Capacitances,” in *Proc. IEEE Applied Power Electronics Conference and Exposition (APEC)*, Phoenix, AZ, USA, June 2021, pp. 178-185. | [Link](#) 

- [C4] **Y. Zhu**, Z. Zhao, B. Shi, J. Ju, Z. Yu, L. Yuan, and K. Chen, “Discrete State Event-Driven Framework for Simulation of Switching Transients in Power Electronic Systems,” in *Proc. IEEE Energy Conversion Congress and Exposition (ECCE)*, Baltimore, MD, USA, Oct. 2019, pp. 895-900. | [Link](#) 
- [C3] B. Shi, Z. Zhao, **Y. Zhu**, Z. Yu, J. Ju, L. Yuan, and K. Chen, “Discrete State Event-Driven Approach for High-Power Converter Simulations,” in *Proc. IEEE Energy Conversion Congress and Exposition (ECCE)*, Baltimore, MD, USA, Oct. 2019, pp. 4627-4631. | [Link](#) 
- [C2] Y. Ling, Z. Zhao, and **Y. Zhu**, “A Novel Digital Active Gate Driver for High-Power IGBT to Reduce Switching Losses and Stresses,” in *Proc. IEEE Energy Conversion Congress and Exposition (ECCE)*, Baltimore, MD, USA, Oct. 2019, pp. 4189-4194. | [Link](#) 
- [C1] X. Wang, Z. Zhao, **Y. Zhu**, K. Chen, and L. Yuan, “A Comprehensive Study on the Gate-Loop Stability of the SiC MOS-FET,” in *Proc. IEEE Energy Conversion Congress and Exposition (ECCE)*, Cincinnati, OH, USA, Oct. 2017, pp. 3012-3018. | [Link](#) 

Patents

- [P3] **Y. Zhu**, and R. C. N. Pilawa-Podgurski, “Switching-Bus-Based Regulated Hybrid Switched-Capacitor Converters,” US 63/558,447, provisional patent application, filed Feb. 27, 2024.
- [P2] T. Ge, Z. Ye, **Y. Zhu**, and R. C. N. Pilawa-Podgurski, “Switched-Bus Based Resonant Switched-Capacitor Converter Architecture,” US Patent No. 2023/0412073, provisional patent application, filed June 13, 2023. | [Link](#) 
- [P1] **Y. Zhu**, Z. Zhao, B. Shi and Z. Yu, “Discrete State Event-Driven Simulation Method for Simulation of Power Electronics System,” US Patent No. 10,970,432, issued Apr. 6, 2021. | [Link](#) 

INVITED TALKS

Professional Societies

IEEE Power Electronics Society Young Professional Webinar Series

- “The Switching Bus Converter: Towards 48-V-to-1-V Single-Stage Vertical Power Delivery for Data Center Applications,” Host: Dr. Joseph Kozak, May 7, 2024. | [Link](#) 

Industry




NVIDIA Corporation

- “The Switching Bus Converter: Towards 48-V-to-1-V Single-Stage Vertical Power Delivery for Data Center Storage,” Host: Dr. Sudhir Kudva, July 18, 2024.

TEACHING EXPERIENCE

Graduate Student Instructor

Department of Electrical Engineering and Computer Sciences, UC Berkeley

- ☰ EE 113/213A: Power Electronics Fall 2023
 - Delivered a lecture on filtering and full-bridge inverter.
 - Prepared and presented in-class hardware demonstrations and recorded a series of hardware demonstration videos. | [Link](#) 
 - Held weekly office hours and lab sessions, created solutions for problem sets and exams, and graded assignments and exams.
 - Awards: [ **Outstanding GSI Award**] [ **Teaching Effectiveness Award**]
- ☰ EE 290: Advanced Topics in Electrical Engineering (graduate-level) Spring 2023
 - Created tutorials, assignments, and exam problems for lectures on coupled inductors.
 - Designed and presented an in-class hardware demonstration on feedback control.
 - Created problem sets, exam problems, and solutions; graded assignments and exams.

Teaching Assistant

Department of Electrical Engineering, Tsinghua University

- ☰ Design and Analysis of Electrical Machine Systems (40220682) Spring 2018
 - Delivered a lecture on control techniques for electrical machines.
 - Created problem set solutions, graded assignments, and organized the final project presentations and evaluations.

INDUSTRY EXPERIENCE

NVIDIA Corporation

Santa Clara, CA, USA

Ph.D. Research Intern, Circuits Research Group (CRG)

May 2023 – Aug. 2023

- Designed, built, and tested a switching bus converter prototype [C19] for single-stage vertical power delivery on NVIDIA's next-generation GPU-accelerated computing platforms.
- Designed a feedback controller for the switching bus converter prototype to meet stringent transient performance requirements without current sensing.

LEADERSHIP AND SERVICE

Secretary of the IEEE Power and Energy Chapter

Jan. 2023 – Dec. 2023

University of California, Berkeley

- Prepared meeting minutes, participated in event planning, and coordinated with speakers for the IEEE PES/PELS Seminars at UC Berkeley.

Deputy Secretary of the Student Union

Aug. 2015 – July 2016

Department of Electrical Engineering, Tsinghua University

- Organized departmental social practice activities and served as the primary organizer for *the 2015 Social Practice Annual Conference* (one of the department's largest student events that brought together more than 200 students, faculty, and staff).

Professional Activities

- Reviewer** IEEE Transactions on Power Electronics (TPEL)
IEEE Transactions on Industrial Electronics (TIE)
IEEE Journal of Emerging and Selected Topics in Power Electronics (JESTPE)
IEEE Journal of Emerging and Selected Topics in Industrial Electronics (JESTIE)
IEEE Open Journal of Power Electronics (OJPEL)
IEEE Open Journal of the Industrial Electronics Society (OJIES)
IEEE Transactions on Circuits and Systems II: Express Briefs (TCAS-II)
IEEE Energy Conversion Congress and Exposition (ECCE)
IEEE Applied Power Electronics Conference and Exposition (APEC)
IEEE Workshop on Control and Modeling for Power Electronics (COMPEL)
IET Power Electronics (PEL)

- Volunteer** 2018 IEEE International Future Energy Challenge (IFEC 2018)