# YICHENG ZHU

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## ACADEMIC POSITION

**The University of Texas at Austin** — Austin, TX, USA

Assistant Professor — Jan. 2026 – Present

- Department: Electrical and Computer Engineering (ECE)
- Group website: Zhu Power Electronics Research Group

**University of California, Berkeley** — Berkeley, CA, USA

Postdoctoral Scholar and Bakar Innovation Fellow — July 2024 – Dec. 2025

- Department: Electrical Engineering and Computer Sciences (EECS)
- 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 Presentation Award: IEEE 40th Applied Power Electronics Conference and Exposition — Apr. 2025

- For conference paper [C21]. Awarded to 1 out of 9 presentations in the Magnetics Modeling session.

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

IEEE PELS Ph.D. Thesis Talk (P3 Talk) Award — Aug. 2025

- Awarded annually to 5 recipients worldwide by the IEEE Power Electronics Society (PELS).

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 *Challenge Cup* 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

[J15] **Y. Zhu**, N. M. Ellis, S. S. Kudva, M. Mosa, C. T. Gray, R. C. N. Pilawa-Podgurski, "A Switching Bus Converter Enabling Direct 48-V-to-Point-of-Load Vertical Power Delivery for High-Performance Data Center Processors," in *IEEE Transactions on Power Electronics*, 2026. | Link

[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, pp. 558–565. | Link **[APEC 2025 Best Presentation Award]**

[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/in$^3$ Power Density," in *Proc. IEEE Applied Power Electronics Conference and Exposition (APEC)*, Atlanta, GA, USA, Mar. 2025, pp. 2276–2283. | Link

[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, pp. 2596-2603. | Link

[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, pp. 4416-4422. | Link

[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/in$^3$ 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 MOSFET," 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

### Book Chapter

[B1] **Y. Zhu**, R. Abramson, T. Ge, E. Candan, N. Brooks, M. Chen, and R. C. N. Pilawa-Podgurski, "Data Center Power Delivery: Capacitor-Based Power Converters," *Wide Bandgap Power Electronics: Emerging Converter Technologies and Applications*, Springer Nature Switzerland, Aug. 2025, pp. 493–546. | Link

## TEACHING EXPERIENCE

**Instructor** — Department of Electrical and Computer Engineering, UT Austin

- ECE 462L: Power Electronics Laboratory — Spring 2026

**Co-Instructor** — Department of Electrical Engineering and Computer Sciences, UC Berkeley

- EE 290-9: Advanced Topics in Power Electronics — Fall 2025

**Graduate Student Instructor** — Department of Electrical Engineering and Computer Sciences, UC Berkeley

- EE 113/213A: Power Electronics — Fall 2023
- EE 290: Advanced Power Electronics — Spring 2023

**Teaching Assistant** — Department of Electrical Engineering, Tsinghua University

- Design and Analysis of Electrical Machine Systems (40220682) — Spring 2018

## Industry Experience

**NVIDIA Corporation** — Santa Clara, CA, USA
Ph.D. Research Intern, Circuits Research Group (CRG) — May 2023 – Aug. 2023

## Leadership and Service

**Secretary of the IEEE Power and Energy Chapter** — Jan. 2023 – Dec. 2023
University of California, Berkeley

### 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 Transportation Electrification (TTE)
- IEEE IAS Publications: Industrial Power Converter Committee (IPCC)
- IEEE IEEE Journal of Solid-State Circuits (JSSC)
- IEEE Internet of Things Journal (IoT)
- IEEE Transactions on Consumer Electronics (TCE)
- IEEE Transactions on Aerospace and Electronic Systems (TAES)
- IEEE Transactions on Systems, Man and Cybernetics: Systems (SMCA)
- IEEE Microwave and Wireless Technology Letters (MWTL)
- IEEE Transactions on Components, Packaging and Manufacturing Technology (TCPMT)
- IEEE Access
- IEEE Transactions on Circuits and Systems II: Express Briefs (TCAS-II)
- IET Power Electronics (PEL)
- 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)

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