YICHENG ZHU

yczhu@utexas.edu ♢ Website ♢ Google Scholar ♢ Linkedin

ACADEMIC POSITION

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

Assistant Professor and Friends of Alec ECE Fellow — 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 34th 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

[J16] **Y. Zhu**, N. M. Ellis, S. S. Kudva, M. Mosa, C. T. Gray, and 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*, vol. 41, no. 7, pp. 11098-11119, July 2026. | Link

[J15] N. M. Ellis, **Y. Zhu**, and R. C. N. Pilawa-Podgurski, "A Gallium Nitride-Based 48 V-to-1 V Point-of-Load Converter for Aerospace Telecommunications and Computing Applications," in *IEEE Transactions on Power Electronics*, vol. 41, no. 5, pp. 7651-7665, May 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

[C24] S. Zhang, **Y. Zhu**, N. Biesterfeld, R. C. N. Pilawa-Podgurski, "Compensation-Winding-Current-Based Constant On-Time Control of Trans-Inductor Voltage Regulators (TLVRs)," in *Proc. IEEE Applied Power Electronics Conference and Exposition (APEC)*, San Antonio, TX, USA, Mar. 2026, pp. 511–517. | Link

[C23] S. Zhang, **Y. Zhu**, N. Biesterfeld, R. C. N. Pilawa-Podgurski, "Analysis and Implementation of a Series-Capacitor Zero-Bias Trans-Inductor Voltage Regulator," in *Proc. IEEE Applied Power Electronics Conference and Exposition (APEC)*, San Antonio, TX, USA, Mar. 2026, pp. 2090–2096. | Link

[C22] E. Wyttenbach, H. B. Sambo, **Y. Zhu**, R. C. N. Pilawa-Podgurski, "An Output Voltage Maximizer for Efficiency Improvement in Resonant Switched-Capacitor Converters," in *Proc. IEEE Applied Power Electronics Conference and Exposition (APEC)*, San Antonio, TX, USA, Mar. 2026, pp. 785–791. | Link

[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

Invited Talks

Academic Talks

[A2] "High-Performance Hybrid Switched-Capacitor Converters and Coupled Magnetics for Direct 48 V to Point-of-Load Vertical Power Delivery," **IEEE Power Electronics Society Webinar**, March 17, 2026. | Link

[A1] "The Switching Bus Converter: Towards 48-V-to-1-V Single-Stage Vertical Power Delivery for Data Center Applications," **IEEE Power Electronics Society Webinar**, Host: Dr. Joseph Kozak, May 7, 2024. | Link

Industry Talks

[I2] "High-Performance Hybrid Switched-Capacitor Converters and Coupled Magnetics for Direct 48 V to Point-of-Load Vertical Power Delivery," **Cirrus Logic**, Host: Dr. Eric King, June 2, 2026.

[I1] "The Switching Bus Converter: Towards 48-V-to-1-V Single-Stage Vertical Power Delivery for Data Center Storage," **NVIDIA**, Host: Dr. Sudhir Kudva, July 18, 2024.

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 I: Regular Papers (TCAS-I)
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)