Logan Horowitz

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» Education

UC Berkeley, EECS Department, Berkeley, CA — 2025
Ph.D. in Electrical Engineering & Computer Science

Cornell University, College of Engineering, Ithaca, NY — 2019
Bachelor of Science in Electrical and Computer Engineering
Graduated Summa Cum Laude with GPA of 4.07; Dean's List (All Semesters)

Ralston Valley High School, Arvada, CO — 2015
GPA 4.45; Salutatorian

» Selected Honors & Awards

ECCE Best Student Demo Award — 2024
IEEE Energy Conversion Congress & Expo (ECCE), 2024.

ARPA-E Best Showcase Award — 2024
ARPA-E Energy Innovation Summit, 2024.

APEC Best Presentation Award — 2024
IEEE Applied Power Electronics Conference (APEC), 2024.

APEC Best Poster Award — 2023
IEEE Applied Power Electronics Conference (APEC), 2023.

APEC Best Presentation Award — 2021
IEEE Applied Power Electronics Conference (APEC), 2021.

ARCS Fellowship — 2018
Cornell University

ELI Research Grant — 2018
Cornell University

Dean's List (All Semesters) | *Cornell University* — 2015 - 2019
Cornell University

» Technical Experience

Power Electronics Researcher | *Pilawa Group, UC Berkeley* 2019 - 2025
Berkeley, CA

Analog IC Design Researcher | *Molnar Group, Cornell University* 2017 - 2019
Ithaca, NY

Robotics Researcher | *CEI Lab, Cornell University* 2017 - 2019
Ithaca, NY

Electrical Design Engineer Co-op | *Lutron Electronics* 2019
Ithaca, NY

Team Lead & Electrical Lead | *Cornell Electric Vehicles* 2018 - 2019
Ithaca, NY

Software Developer | *Simoti* 2017
Tel Aviv, Israel

» Teaching & Mentoring Experience

Power Electronics Researcher | *Pilawa Group, UC Berkeley* 2019 - 2025
Berkeley, CA

Mentor | *Polygence* 2021 - 2023
Berkeley, California

TA for Intro to Power Electronics | *UC Berkeley* 2022 - 2024
Berkeley, California

TA for Intro to Circuit Design | *Cornell University* 2019
Ithaca, New York

TA for Intelligent Physical Systems | *Cornell University* 2018
Ithaca, New York

TA for Microelectronics | *Cornell University* 2017
Ithaca, New York

Tutor for Electricity & Magnetism | *Cornell University ELI* 2017
Ithaca, New York

Tutor for Intro to Matlab | *Cornell University ELI* 2017
Ithaca, New York

TA for Intro to Matlab | *Cornell University* 2016
Ithaca, New York

AP Calculus AB Tutor | *Ralston Valley High School* 2013 - 2015
Arvada, Colorado

Pre-Calculus Tutor | *Ralston Valley High School* 2013 - 2015
Arvada, Colorado

Middle School Math Tutor | *Ralston Valley High School* 2013 - 2015
Arvada, Colorado

» Publications

Patents

[P. 1] R. C. N. Pilawa-Podgurski, L. Horowitz, S. T. Mahbub, J. Zou, N. M. Ellis, N. Miljkovic, "Flexible and Scalable Thermal Test Vehicle Design for Electronics Cooling Solutions," US 63/708,279, provisional patent application, filed October 17, 2024.

Journal Publications

[J. 5] L. Horowitz and R. C. N. Pilawa-Podgurski, "Design of a High Performance Flying Capacitor Multilevel Inverter for Electric Vehicles with Stacked Printed Circuit Boards," in *IEEE Transactions on Power Electronics*, doi: 10.1109/TPEL.2025.3609699.

[J. 4] 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.

[J. 3] Gebrael, T., Li, J., Gamboa, A.R. et al. High-efficiency cooling via the monolithic integration of copper on electronic devices. Nat Electron 5, 394–402 (2022).

[J. 2] Wilson NJ, Ceron S, Horowitz L and Petersen K (2020) Scalable and Robust Fabrication, Operation, and Control of Compliant Modular Robots. Front. Robot. AI 7:44.

[J. 1] Koenig, P.A., Smith, M.L., Horowitz, L.H. et al. Artificial shaking signals in honey bee colonies elicit natural responses. Sci Rep 10, 3746 (2020).

Conference Publications

[C. 21] L. Horowitz, S. T. Mahbub, J. Zou and R. C. N. Pilawa-Podgurski, "A Flexible and Scalable Thermal Test Vehicle Design for Electronics Cooling Solutions," 2025 IEEE Electronic Components and Technology Conference (ECTC), Dallas, TX, USA, 2025. (In Review)

[C. 20] F. Giardine, S. Krishnan, L. Horowitz and R. C. N. Pilawa-Podgurski, "Leveraging Variable Frequency Techniques for High Level-Count FCML Inverters for Improved Efficiency and Conducted EMI," 2025 IEEE Applied Power Electronics Conference and Exposition (APEC), Atlanta, GA, USA, 2025. (Accepted)

[C. 19] J. Zou, Y. Zhu, N. M. Ellis, L. Horowitz and R. C. N. Pilawa-Podgurski, "A 48-V-to-0.8-V Gallium Nitride Switching Bus Converter for Processor Vertical Power Delivery with 2.7 mm Thickness and 2145 W/in^3 Power Density," 2025 IEEE Applied Power Electronics Conference and Exposition (APEC), Atlanta, GA, USA, 2025. (Accepted)

[C. 18] L. Horowitz, J. Zou and R. C. N. Pilawa-Podgurski, "Design and Optimization of a High Performance 3D-Stacked Flying Capacitor Multilevel Inverter for Electric Drivetrains," 2025 IEEE Applied Power Electronics Conference and Exposition (APEC), Atlanta, GA, USA, 2025. (Accepted)

[C. 17] E. Krause, S. Coday, L. Horowitz and R. C. N. Pilawa-Podgurski, "An 840 V-to-120 V Radiation-Tolerant Flying Capacitor Multilevel Converter for Space Robotics," 2024 IEEE Energy Conversion Congress & Expo (ECCE), Atlanta, GA, USA, 2024. (Accepted)

[C. 16] L. Horowitz, R. Abramson and R. C. N. Pilawa-Podgurski, "Unified Framework for the Passive Volume Comparison of Power Converter Topologies," 2024 IEEE Workshop on Control and Modeling for Power Electronics (COMPEL), Lahore, Pakistan, 2024, pp. 1-8.

[C. 15] B. Liao, L. Horowitz, S. T. Mahbub and R. Pilawa-Podgurski, "A Modular Multi-Phase High-Power Resistive Load Bank with Zero-Current Switching Functionality," 2024 IEEE Power and Energy Conference at Illinois (PECI), Urbana, IL, USA, 2024, pp. 1-6. **(Best Presentation Award)**

[C. 14] L. Horowitz and R. C. N. Pilawa-Podgurski, "A 14-level FCML Inverter for Electric Vehicles with Optimal Capacitors Achieving 175 kW/kg and 380 kW/L Power Density," 2024 IEEE Applied Power Electronics Conference and Exposition (APEC), Long Beach, CA, USA, 2024, pp. 1009-1013. **(Best Presentation Award)**

[C. 13] L. Horowitz, N. Brooks, N. M. Ellis and R. C. N. Pilawa-Podgurski, "The Flying Capacitor LLC Converter: A Hybrid Switched Capacitor Converter with Galvanic Isolation for Large Step-Down Applications," 2023 IEEE 24th Workshop on Control and Modeling for Power Electronics (COMPEL), Ann Arbor, MI, USA, 2023, pp. 1-7.

[C. 12] 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," 2023 IEEE Applied Power Electronics Conference and Exposition (APEC), Orlando, FL, USA, 2023, pp. 1989-1996. **(Best Paper Award)**

[C. 11] L. Horowitz, N. M. Ellis and R. C. N. Pilawa-Podgurski, "Decoupling Device for Small Commutation Loop and Improved Switching Performance with Large Power Transistors," 2023 IEEE Applied Power Electronics Conference and Exposition (APEC), Orlando, FL, USA, 2023, pp. 2620-2624. **(Best Poster Award)**
[C. 10] N. Stokowski, S. Coday, L. Horowitz and R. C. N. Pilawa-Podgurski, "A Mechanically Ultra-thin Flying Capacitor Multilevel Converter with Embedded Passive Components," 2023 IEEE Applied Power Electronics Conference and Exposition (APEC), Orlando, FL, USA, 2023, pp. 2625-2629.

[C. 9] L. Horowitz and R. C. N. Pilawa-Podgurski, "High Power Density Flying Capacitor Multilevel Inverter for Electric Aircraft with a Stacked PCB Interleaved Hybrid Commutation Loop Design," 2023 IEEE Applied Power Electronics Conference and Exposition (APEC), Orlando, FL, USA, 2023, pp. 1065-1069.

[C. 8] N. M. Ellis, L. H. Horowitz, R. K. Iyer, N. C. Brooks and R. C. N. Pilawa-Podgurski, "An Actively Balanced Distributed Regenerative Snubber with Reduced Part Count in Multi-Level Power Converters," 2022 IEEE Energy Conversion Congress and Exposition (ECCE), Detroit, MI, USA, 2022, pp. 1-4.

[C. 7] L. Horowitz and R. C. N. Pilawa-Podgurski, "On Decoupling Capacitor Size in GaN-Based Power Converters," 2022 IEEE 23rd Workshop on Control and Modeling for Power Electronics (COMPEL), Tel Aviv, Israel, 2022, pp. 1-5.

[C. 6] L. Horowitz and R. C. N. Pilawa-Podgurski, "Modular Switching Cell Design for High-Performance Flying Capacitor Multilevel Converter," 2022 IEEE Applied Power Electronics Conference and Exposition (APEC), Houston, TX, USA, 2022, pp. 342-347.

[C. 5] N. C. Brooks, L. Horowitz, R. Abramson and R. C. N. Pilawa-Podgurski, "Low-Inductance Asymmetrical Hybrid GaN HEMT Switching Cell Design for the FCML Converter in High Step-Down Applications," 2021 IEEE Applied Power Electronics Conference and Exposition (APEC), Phoenix, AZ, USA, 2021, pp. 9-15.

[C. 4] L. Horowitz, N. Pallo, S. Coday and R. C. N. Pilawa-Podgurski, "A Method of Partial Inductances to Evaluate and Optimize Switching Cells," 2021 IEEE Applied Power Electronics Conference and Exposition (APEC), Phoenix, AZ, USA, 2021, pp. 1549-1554. **(Best Presentation Award)**

[C. 3] S. Ceron, Logan Horowitz, N. Wilson, C. Chen, D. Kim, K. Petersen “Towards a Scalable, Self-Reconfigurable Robot with Compliant Modules,” IEEE International Symposium On Multi-Robot and Multi-Agent Systems (MRS), New Brunswick, 2019.

[C. 2] S. Ceron, N. Wilson, L. Horowitz, and K. Petersen, “Comparative Analysis of Sensors in Rigid and Deformable Modular Robots for Shape Estimation,” IEEE International Symposium On Multi-Robot and Multi-Agent Systems (MRS), New Brunswick, 2019.

[C. 1] T. Duggan, L. Horowitz, A. Ulug, E. Baker, and K. Petersen, “Inchworm-inspired locomotion in untethered soft robots,” IEEE-RAS Conference on Soft Robotics (RoboSoft), Seoul, 2019.

» Presentations & Demonstrations

"Demonstration of a Transistor Array Thermal Test Vehicle for Electronics Cooling Solutions," Demonstration, IEEE Energy Conversion Congress & Expo, 2024. **(Best Student Demo Award) (1st place out of 41 teams)**

"A Flexible and Scalable Thermal Test Vehicle Design for Electronics Cooling Solutions," Lecture Presentation, OCP Future Technologies Symposium, 2024.

"A Flexible and Scalable Thermal Test Vehicle Design for Electronics Cooling Solutions," Poster Presentation, OCP Future Technologies Symposium, 2024.

"Holistic Rack-to-Processor Power and Thermal Co-Design for Future Servers," ARPA-E Energy Innovation Summit, 2024. **(Best Showcase Award) (1st place out of 19 teams)**

"A 14-level FCML Inverter for Electric Vehicles with Optimal Capacitors Achieving 175 kW/kg and 380 kW/L Power Density," Lecture presentation, IEEE Applied Power Electronics Conference (APEC), 2024. **(Best Presentation Award)**

"The Flying Capacitor LLC Converter: A Hybrid Switched Capacitor Converter with Galvanic Isolation for Large Step-Down Applications," Poster presentation, IEEE Workshop on Control and Modelling for Power Electronics (COMPEL), 2023.

"High Power Density Flying Capacitor Multilevel Inverter for Electric Aircraft with a Stacked PCB Interleaved Hybrid Commutation Loop Design," Lecture presentation, IEEE Applied Power Electronics Conference (APEC), 2023.

"Decoupling Device for Small Commutation Loop and Improved Switching Performance with Large Power Transistors," Poster presentation, IEEE Applied Power Electronics Conference (APEC), 2023. **(Best Poster Award)**

"On decoupling capacitor size in GaN-based power converters," Poster presentation, IEEE Workshop on Control and Modelling for Power Electronics (COMPEL), 2022.

"Modular switching cell design for high-performance flying capacitor multilevel converter," Lecture presentation, IEEE Applied Power Electronics Conference (APEC), 2022.

"A method of partial inductances to evaluate and optimize switching cells," Lecture presentation, IEEE Applied Power Electronics Conference (APEC), 2021. **(Best Presentation Award)**

"Inchworm-inspired locomotion in untethered soft robots," Poster presentation, IEEE International Conference on Soft Robotics (RoboSoft), 2019.

"Passive Mixer Topology for Improved CDMA Signal Orthogonalization," Poster presentation, JUMP ComSenTer Annual Review, 2019.

"New Technologies For Studying Shaking Signals In Honeybees," Poster presentation, Cornell Summer Research Symposium, 2018.