

Mitchell D. Kelley

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EDUCATION

PhD, Electrical Engineering, Texas Tech University, Lubbock TX, December 2019

Dissertation: *Design and simulation of a fuel cell power plant with dynamic multi-unit load sharing in grid-connected and grid-isolated modes of operation*

MS, Electrical Engineering, Texas Tech University, Lubbock TX, December 2014

Thesis: *Evaluation of advanced silicon carbide half-bridge modules*

BS, Electrical Engineering, Texas Tech University, Lubbock TX, December 2012

WORK HISTORY

Academic Experience

- Instructor, Texas Tech University, Lubbock TX, Spring 2021 – *Present*
- Research Scientist, Center for Emerging Energy Sciences, Texas Tech University, Lubbock TX, Oct. 2020 – *Present*
- Visiting Scholar, Texas Tech University, Lubbock TX, Sept. 2017 – Nov. 2019
- Graduate Research Assistant, Center for Pulsed Power and Power Electronics, Texas Tech University, Lubbock TX, 2016 - 2017
- Graduate Student Instructor, Texas Tech University, Lubbock TX, Spring 2016
- Teaching Assistant, Texas Tech University, Lubbock TX, 2015
- Graduate Research Assistant, Center for Pulsed Power and Power Electronics, Texas Tech University, Lubbock TX, 2013 – 2014

External Positions

- Research Scientist, Concentric Advisors Texas, Lubbock TX, Sept. 2017 – Nov. 2019
- Intern, Army Research Laboratory, Adelphi MD, May 2015 – Aug. 2015

Consulting Work

- Texas Tech Physics & Astronomy Department, March – October 2020
- Tune Studio, May 2020 – May 2021

PEER-REVIEWED PUBLICATIONS

6. **Mitchell Kelley**, Madison Atwood, Trevor Dardik, Dennis Van der Vliet, Shelby Lacouture, Jephthah Akene, Samuel Adeosun, and Robert V. Duncan, “An Open-System Differential Vacuum Calorimeter,” *Journal of Thermal Analysis and Calorimetry*, submitted June 2, 2023, revision in progress.
5. **Mitchell Kelley**, Bejoy Pushpakaran, Argenis Bilbao, James Schrock, and Stephen Bayne, “Single-pulse avalanche mode operation of 10-kV/10-A SiC MOSFET,” *Microelectronics Reliability*, vol. 81, pp. 174-180 (2018).
4. **Mitchell Kelley**, Bejoy Pushpakaran, and Stephen Bayne, “Single-Pulse Avalanche Mode Robustness of Commercial 1200 V/80 mΩ SiC MOSFETs,” *IEEE Transactions on Power Electronics*, vol. 32, no. 8, pp. 6405-6415 (2017).
3. James Schrock, Emily Hirsch, Shelby Lacouture, **Mitchell Kelley**, Argenis Bilbao, William Ray, Stephen Bayne, Michael Giesselmann, Heather O’Brien, and Aderinto Ogunniyi, “Failure Modes of 15-kV SiC SGTO Thyristors During Repetitive Extreme

Pulsed Overcurrent Conditions,” *IEEE Transactions on Power Electronics*, vol. 31, no. 12, pp. 8058-8062 (2016).

2. Argenis Bilbao, James Schrock, William Ray, **Mitchell Kelley**, Shad Holt, Michael Giesselmann, and Stephen Bayne, “Development and testing of an active high voltage saturation probe for characterization of ultra-high voltage silicon carbide semiconductor devices,” *Review of Scientific Instruments*, vol. 86, pp. 085104 (2015).
1. James Schrock, Bejoy Pushpakaran, Argenis Bilbao, William Ray, Emily Hirsch, **Mitchell Kelley**, Shad Holt, and Stephen Bayne, “Failure Analysis of 1200-V/150-A SiC MOSFET Under Repetitive Pulsed Overcurrent Conditions,” *IEEE Transactions on Power Electronics*, vol. 31, no. 3, pp. 1816-1821 (2015).

NON-PEER-REVIEWED PUBLICATIONS

6. Michael Giesselmann, Stephen Bayne, Nimat Shamin, David Reale, Fatih Cingoz, and **Mitchell Kelley**, “Modelling of inverters for fuel cells for grid-tied and islanding mode with smooth transitions,” *2018 IEEE International Power Modulator and High Voltage Conference Proceedings*, pp. 172-175 (2018).
5. Argenis Bilbao, James Schrock, **Mitchell Kelley**, Emily Hirsch, William Ray, Stephen Bayne, Michael Giesselmann, “Continuous switching of ultra-high voltage silicon carbide MOSFETs,” *2016 IEEE International Power Modulator and High Voltage Conference*, pp. 463-466 (2016).
4. **Mitchell Kelley**, Argenis Bilbao, William Ray, James Schrock, Stephen Bayne, “Evaluation and Comparison of 1200-V/285-A Silicon Carbide Half-Bridge MOSFET Modules,” *2015 Pulsed Power Conference Proceedings*, pp. 1-4 (2015).
3. Argenis Bilbao, James Schrock, William Ray, **Mitchell Kelley**, Stephen Bayne, “Analysis of advanced 20 kV/ 20 A Silicon Carbide Power Insulated Gate Bipolar Transistor in Resistive and Inductive Switching Tests,” *2015 Pulsed Power Conference Proceedings*, pp. 1-3 (2015).
2. William Ray, James Schrock, Argenis Bilbao, **Mitchell Kelley**, Shelby Lacouture, Emily Hirsch, Stephen Bayne, “Analysis of GaN power MOSFET exposure to pulsed overcurrent,” *2015 Pulsed Power Conference Proceedings*, pp 1-5 (2015).
1. James Schrock, William Ray, Argenis Bilbao, **Mitchell Kelley**, Emily Hirsch, Shad Holt, Stephen Bayne, “Development of secondary breakdown circuit for DV/dt analysis of SiC devices,” *2015 Pulsed Power Conference Proceedings*, pp. 1-5 (2015).

TECHNICAL POSTERS

3. Muhammad Umer Farooq, Samuel Adeosun, Cuikun Lin, Peyton Thorn, **Mitchell Kelley**, Robert Duncan, “Exploring Palladium-Based Nanomaterials for Enhanced Electrochemical Nitrogen Fixation: Synthesis and Catalytic Insights,” Texas Section APS, October 2023.
2. **Mitchell Kelley**, “Characterization and Modelling of High Voltage SiC Diodes,” Army Research Lab Summer Student Symposium, August 2015.
1. **Mitchell Kelley**, William Ray, and Stephen Bayne, “Evaluation and Comparison of 1200-V/285-A Silicon Carbide Half-Bridge MOSFET Modules,” Texas Tech University Graduate Student Research Poster Competition, April 2015.

TECHNICAL PRESENTATIONS

1. Michael Giesselmann, Stephen Bayne, Nimat Shamin, David Reale, Fatih Cingoz, and **Mitchell Kelley**, “Modelling of inverters for fuel cells for grid-tied and islanding mode with smooth transitions,” 2018 IEEE International Power Modulator and High Voltage Conference, Jackson Hole, WY, June 2018.

PATENTS

1. M. Dardik, R. Duncan, S. Lacouture, **M. Kelley**, M. Atwood, D. Van Der Vliet, “Vacuum Calorimeter Open System Differential Calorimeter,” United States Patent Application 63235664, August 20, 2021.

JOURNAL REVIEWS

- IEEE Transactions on Power Electronics (3)
- IEEE Transactions on Industrial Electronics (2)
- IEEE Journal of Emerging and Selected Topics in Power Electronics (4)

PROFESSIONAL MEMBERSHIPS

- Institute of Electrical and Electronic Engineers, Member

COURSES TAUGHT

- ECE 5316: Power Electronics, Scheduled Spring 2024
- ECE 3335: Power Systems Project Laboratory, Fall 2023
- ECE 3311: Electronics I, Spring 2023
- ECE 5354: Power Semiconductor Devices, Spring 2022
- ECE 3362: Microcontrollers with Assembly, Spring 2021 – Spring 2022
- ECE 3331: Project Laboratory 1: Robotics, Spring 2016, Spring 2021 – Spring 2023

TRAINING

- COMSOL Multiphysics Fundamentals Course, Redwood City CA, February 2018.
- COMSOL Multiphysics Master Course, Redwood City CA, February 2018.

AWARDS

- **M. Kelley**, W. Ray, S. Bayne, Texas Tech University Graduate Student Research Poster Competition 2nd Place, 2015.
- **M. Kelley**, L. Walker, IEEE Region 5 Student Design Contest 2nd Place, 2012.