

LANDON K MACKEY

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Education

Doctor of Philosophy in Electrical Engineering; Expected Completion May 2019

- North Carolina State University
- Advisor: Dr. Iqbal Husain
- Research Focus: Design and Integration of Medium Voltage DC Circuit Breakers

Master of Science in Electric Power Systems Engineering; December 2016

- North Carolina State University
- Advisor: Dr. Ewan Pritchard
- Research Focus: Implementation of a Modular Electric Generator in the Dominican Republic
- Graduate Certificate: Renewable Electric Energy Systems, May 2016

Bachelor of Science in Electrical Engineering; May 2015

- North Carolina State University
- Renewable Electric Energy Systems Concentration
- Passed Fundamentals of Engineering (FE) Exam; January 2015

Professional Experience

August 2016 – Present: Graduate Research Assistant (Ph.D.) – FREEDM Systems Center – Raleigh, NC, USA

- Designing, simulating, and testing next generation DC Circuit Breakers and Controllers
- Electrical team lead for Coastal Studies Institute Ocean Compressed Air Energy Storage Project

August 2015 – August 2016: Graduate Research Assistant (MS) – FREEDM Systems Center – Raleigh, NC, USA

- Lead prototype and testing engineer for 50 kVA distributed energy management and control platform
- Accelerated design and deployment schedule for immediate integration to Dominican Republic grid
- Performance testing, factory acceptance testing, and pilot validation of Modular Electric Generator
- Summer Program Coordinator for 20 school teachers and students, and engineering undergraduates

June 2015 – August 2015: Electrified Powertrain Engineering Intern, Ford Motors – Dearborn, MI, USA

- Designed high-voltage testing procedures for next generation electric vehicle charging system
- Executed high-voltage and high-current testing on prototype vehicle while ensuring laboratory safety
- Analyzed results to characterize and determine origin of improper system behavior
- Concisely presented testing anomalies to management and suppliers to expedite software revisions

August 2014 – May 2015: Undergraduate Research Scholar – FREEDM Systems Center – Raleigh, NC, USA

- Researched and presented future DC distribution as an immediate pupil of the center director
- Designed scalable applications of solid-state transformer technology for industry introduction
- Directed Educational Outreach program for the student leadership council

May 2014 – August 2014: Power Conversion Systems Intern – ABB – Dätwill, Aargau, Switzerland

- Manufactured, debugged, and tested high-power, high-density power converter cells.
- Designed, installed, and documented power converter medium-voltage and high-current cabling, low-voltage and control wiring, and test-bed subsystems
- Assisted in the commissioning of medium-voltage converter as part of systems and partitioning team

August 2004 – August 2010: EMN2(SS) Nuclear Submarine Electrician – U.S. Navy – Pearl Harbor, HI, USA

- Led a division of 14 electricians through an extensive maintenance overhaul
- Conducted preventative maintenance and major repair to electrical distribution, pumps and motors, hydraulic systems, high power generators, and storage batteries

Technical Experience and Skills

- Commissioning
- Prototyping
- Research and design
- Troubleshooting
- Systems integration
- MATLAB-Simulink
- Simulink
- PLECS
- Cadence Tools Suite
- PSCAD
- Microsoft Office Suite
- COMSOL
- Held Secret-Level US security clearance
- Technical and non-technical communication, both written and oral
- OSHA and MSHA

Electrical Engineering Courses Completed or in Progress:

- Design of Electromechanical Systems
- Dynamic Control of Electric Machines
- Power System Transients Analysis
- Smart Electric Power Distribution
- Electric Power System Protection
- Design of Solar Thermal Systems
- Power System Operation and Control
- Power Electronics
- SCADA Communication for Smart Grid
- Business of the Electric Utility
- Renewable Electrical Energy Systems
- Electric Motor Drives

Honors and Awards

- Graduated Cum Laude with B.S. in Electrical Engineering at North Carolina State University
- Eta Kappa Nu – IEEE National Honor Society Fellow
- ABB Scholarship in Power Engineering Fellow
- Duke Energy Smart Grid Scholarship Fellow
- McNeill Graduate Research Fellowship Fellow
- Two-time recipient of Navy-Marine Corp Achievement Medal

Publications

- C. Peng, **L. Mackey**, I. Husain, A. Huang, B. Lequesne and R. Briggs, "Active damping of ultra-fast mechanical switches for hybrid AC and DC circuit breakers," *2016 IEEE Energy Conversion Congress and Exposition (ECCE)*, Milwaukee, WI, 2016, pp. 1-8.
- Pam Page Carpenter, Adam Stevens, Erik Schettig, **Landon K. Mackey**, and Catherine M. McEntee. "Addressing one of the Engineering Challenges in Pre-College Programs: Modernizing the Electric Grid". 2017 ASEE Annual Conference & Exposition, Columbus, Ohio, 2017, June. ASEE Conferences, 2017.
- **L. Mackey**, M. Rifat Kaiser Rachi, C. Peng and I. Husain, "Z-Source circuit breaker utilizing Ultra-Fast Mechanical Switch for high efficiency DC circuit protection," *2017 IEEE Second International Conference on DC Microgrids (ICDCM)*, Nuremberg, Germany, 2017, pp. 452-458.
- E. Pritchard, **L. Mackey**, D. Zhu, D. Gregory and G. Norris, "Modular electric generator rapid deployment DC microgrid," *2017 IEEE Second International Conference on DC Microgrids (ICDCM)*, Nuremberg, Germany, 2017, pp. 106-110.
- C. Peng; **L. Mackey**; I. Husain; A. Huang; W. Yu; B. Lequesne; R. Briggs, "Active damping of ultra-fast mechanical switches for hybrid AC and DC circuit breakers," in *IEEE Transactions on Industry Applications*, vol. PP, no.99, pp.1-1
- **L. Mackey**, M. R. K. Rachi, C. Peng and I. Husain, "Optimization of a Z-Source, Ultra-Fast Mechanically Switched, High Efficiency DC Circuit Breaker," *2017 IEEE Energy Conversion Congress and Exposition (ECCE)*, Cincinnati, OH, 2017, pp. 1-7.

Leadership Roles

- Student Body President – National Science Foundation Engineering Research Center, across 7 Universities and more than 200 students for two years
- Electric Power Systems Engineering Program Ambassador at North Carolina State University
- Graduate Mentor of year long, College of Engineering Senior Design research project
- Education and outreach director – Student Leadership Council at FREEDM Systems Center
- Project leader – year-long electric vehicle battery pack design and installation project
- Division Leader of 14 electricians through an extensive overhaul on Naval Nuclear Submarine