

Greg Dahlberg

Advising Professor Alexis Kwasinski

- Energy Course Work:
 - Distributed Generation Technologies
 - Power Systems Engineering
 - Renewable Energy and Power Systems
 - Power Electronic Devices and Systems
 - Optimization of Engineering Systems
- Supporting Course Work
 - Digital Logic Design with VHDL
 - Electrochemical Energy Systems
 - Electromechanical transducers
- Masters Thesis
 - Fault clearance in distributed power architectures with limited energy flow through power electronic interfaces
- Previous Education
 - B.S. in Mathematics, University of Illinois, 2002
 - M. Ed in Secondary Education, DePaul University, 2005

Microgrid Availability Modeling

- Goal:
 - 1. Understand how variations in certain parameters affect Microgrid Availability. Study effect of adding energy storage (essential to address renewable generation variability)
 - 2. Experimental validation of minimal cut sets approach through Monte Carlo Simulations
- Motivation
 - Search for cost effective solutions
 - Critical to sensitive loads: Hospitals/ Military
- Method
 - Markov Chains
 - Monte Carlo Methods
 - Minimal Cut Sets

Some Results

- Monte Carlo Method experimentally validated minimal cut set calculations
- Backup battery storage increases 4 9's to 6 9's
- Pure Discrete Markov Methods yields more conservative findings (trade off is more complex computations)

