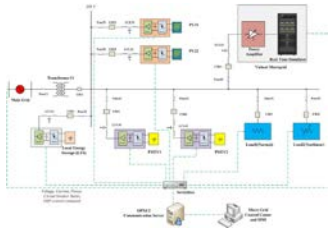
Department of Electrical Engineering

Energy Systems

Jennifer Zirnheld

Insulation Coordination; Energy Systems; Mobility Platforms; Nano-Dielectrics

Xiu Yao



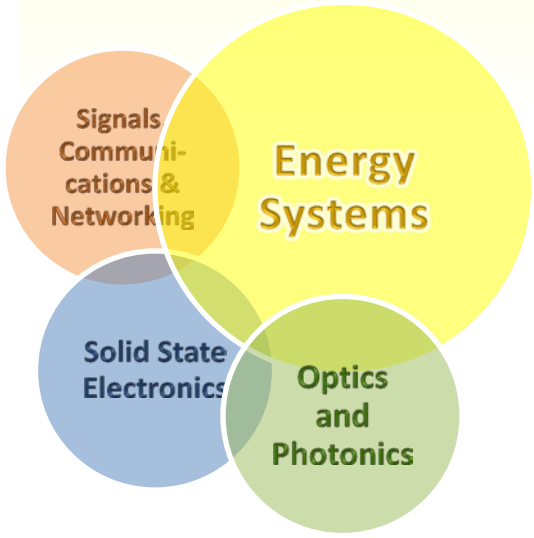
Power electronics, Microgrid control and protection, High voltage dc transmission, High voltage engineering,

HyungSeon Oh

Power System Economics; Renewable Energy Integration; Smart Grids; Visualization

Kevin Burke

Power and Energy Management, Power Transmission and Distribution, Dielectric Phenomena, Pulsed Power, Insulation Performance/Reliability



Current Research Projects in Energy Systems:

Non-Thermal Plasma characterization for the treatment of Melanoma • Protection of Munitions Applications Exposed to Electromagnetic Pulse and Repetitive Electromagnetic Pulse • Peak Load Shaving Technology with Renewable Resources • High Penetration of Solar Electricity into the Electric Grid • Efficient and Reliable Energy Delivery Infrastructure • Microgrids, Distributed Energy Resources, and Power System Reliability Scope • Demand Side Management: On-line efficiency control in facilities using Smart Grids • Efficient Algorithm for Solving AC Optimal Power Flow • Smart Electric Transmission and Distribution Grid Systems • Operation strategies for modular multilevel converter based multiterminal high voltage dc transmission • Modeling, detection, and protection of dc arc fault in dc based electrical systems • Coordinated protection and control of dc microgrids • High power electronics applications •

Sample of Funded Projects:

Oh, HyungSeon, Consortium for Electric Reliability Technology Solutions (CERTS) “Towards An Efficient AC Optimal Power Flow & Global Optimizer Solutions,” $220,000

Zirnheld, Jennifer and Anderson, NASA Space Grant, $70,000

Zirnheld, Jennifer, Electric Power Research Institute, “Grid Modernization and Power Quality Study for the Buffalo Niagara Medical Campus Member Institutes: University at Buffalo Assessment and Analysis Efforts,” $50,000

Sample of Research Contributions:

H. Oh and R. Thames, “A Method for Identifying Market Power,” *Decision Support Systems*, In Press.

X. Yao, L. Herrera, S. Ji, K. Zou, and J. Wang, "Characteristics study and time domain-discrete wavelet transform based hybrid detection of series dc arc faults," *IEEE Transactions on Power Electronics*, vol. 29, no. 6, pp. 3101-3115, June 2014.

Muffoletto, Daniel P, Zirnheld, J., Burke, Kevin M. "Anticipating electrical breakdown in dielectric elastomer actuators," *SPIE*, Proc. SPIE 8687, Electroactive Polymer Actuators and Devices (EAPAD) 2013, 86870U April 2013.

H. Oh, "Aggregation of Buses for a Network Reduction," *IEEE Transactions on Power Systems*, vol. 27, no. 2, pp. 705-712 May, 2012.

Shoshanna N. Zucker, Jennifer Zirnheld, et al., “Preferential induction of apoptotic cell death in melanoma cells as compared with normal keratinocytes using a non-thermal plasma torch”. *Cancer Biology & Therapy* 13:13, 1–8; November 2012.

Muffoletto, D. P.; Disanto, T.M.; Upia, A.; Burke, K. M.; Zirnheld, J.L., “Analysis of Initial Strike and Re-strike Modes in Exploding Metallized Films,” *IEEE Transactions on Plasma Science Special Issue Images in plasma science*, vol. 39, Issue: 11, Part: 1, pp. 2426-2427. November 2011.

X. Yao, Y. Huang, F. Guo, and J. Wang, "Advanced concepts for vertical stability power supply in fusion devices," *IEEE Transactions on Plasma Science*, vol. 40, no. 3, pp. 761-768, March 2012.