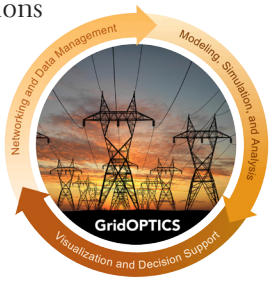
Future Power Grid Initiative Newsletter

October 2011

This month, FPGI expanded its interactions with industry and regulatory agencies. Researchers from the three Focus Areas Networking and Data Management; Grid Modeling, Simulation, and Analysis; and Visualization and Decision Support published papers and were recognized for their leadership in grid research.



HIGHLIGHTS & NOTABLE ACHIEVEMENTS

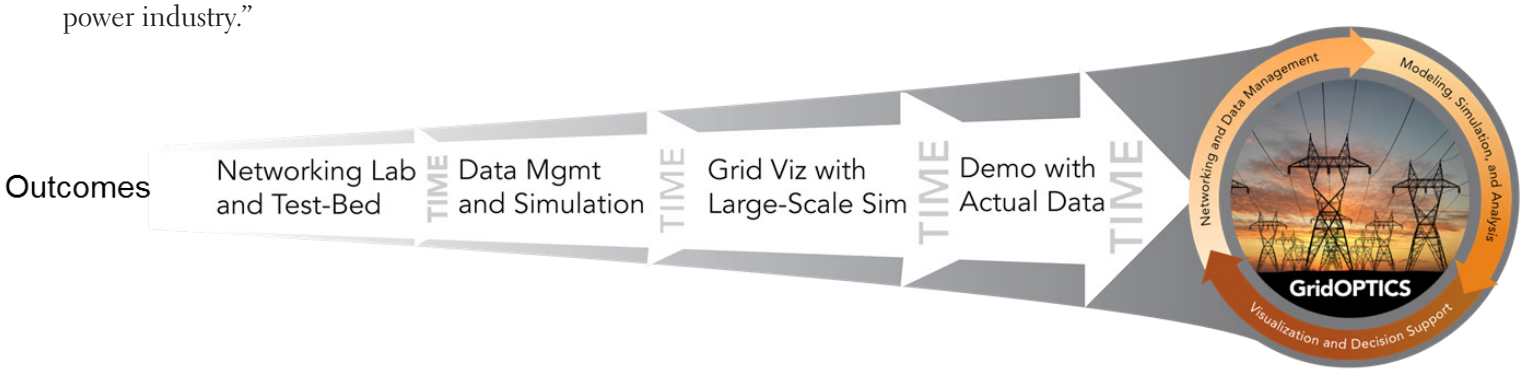
- Focus Area one lead Bora Akyol has been selected to be a fellow of the National Board of Information Security Examiners, or NBISE. As a member of the Smart Grid Cybersecurity Panel, Bora will work with a distinguished group of cyber security experts to create a certification for smart grid cyber security professionals. His engagement will support developing solutions for the cyber security challenges of the future power grid.
- The team around Thomas Edgar is building momentum around powerNET, the test bed designed to create a virtual research resource that power grid stakeholders can dynamically configure. After submitting a paper to the IEEE Technologies for Homeland Security conference, Thomas was invited to participate in a panel covering creating and using cyber-physical test beds. The conference is November 15-17.
- Gariann Gelston and her team have successfully expanded interaction with NERC and industry. Last month, the team attended the NERC Operation Reliability Subcommittee Meeting in Montreal Sept. 22-21. The same month, Gariann's team met with reliability coordinators from PJM and SPP, who stated that their approach to Decision Support for Future Power Grid Organizations was "changing the paradigm of the power industry."

Papers

- Thomas Edgar, David Manz, Thomas Carroll, David McKinnon, Bora Akyol, Paul Skare, Cody Tews and Jason Fuller. "Towards an Experimental Testbed Facility for Cyber-Physical Security Research." 2011 Cyber Security and Information Intelligence Research Workshop. *ACM International Conference Proceedings*. October 12-14, 2011.
- Peter Hui, Satish Chikkagoudar, Daniel Chavarria, Mark Johnston, "Towards a Real-Time Cluster Computing Infrastructure." *2011 Real-Time Systems Symposium in Vienna*, Austria. November 29 – December 2, 2011.

Upcoming Papers

- T. Gibson, A. Kulkarni, K. Kleese van Dam, T. Critchlow, "The Feasibility of Moving PMU Data in the Future Power Grid", *Submitted to the 2011 CIGRE Canada Conference on Power Systems*, Sept. 2011, PNNL-SA-80268
- K. Kalsi, F. Chassin and D. Chassin, "Aggregated Modeling of Thermostatic Loads in Demand Response: A Systems and Control Perspective", *IEEE Conf. Decision and Control*, Orlando, FL, Dec. 2011, accepted.
- K. Kalsi, M. Elizondo, J. Fuller, S. Lu and D. Chassin, "Aggregated Thermostatically Controlled Load Models for Demand Response", submitted to *HICSS*, Jan. 2012, accepted.



FPGI FOCUS AREAS

Focus Area One addresses data networking and management issues, and enables the digital infrastructure for the future grid. This focus area will address the gaps in networking and real-time data management by developing advanced algorithms and software tools and techniques. **Focus Area Leads**: Bora Akyol (bora@pnnl.gov) and Phil Craig (philip.craig@pnnl.gov)

Focus Area Two targets research in the areas of advanced mathematical models, next-generation simulation and analytics capabilities for the power grid. Projects in Focus Area Two will use high-throughput data streams produced by projects in Focus Area One and integrate them with sophisticated mathematical models to conduct large-scale power grid simulation and analysis. Focus Area Two strives to advance the state-of-the-art in modeling and simulation in order to achieve much higher fidelity situational awareness and global comprehension for power grid stability, efficiency and flexibility. **Focus Area Leads**: Daniel Chavarria (daniel.chavarria@pnnl.gov), Tom Ferryman (tom.ferryman@pnnl.gov), and Ning Zhou (ning.zhou@pnnl.gov)

Focus Area Three aims to convert large amounts of model and sensor data into information and knowledge to support decisions in grid operation, planning, and policymaking. This area concentrates on the development of coordinated visualization interfaces and decision support capabilities in a modular, extensible software environment that can be used for both real-time grid operations as well as long-term planning. **Focus Area Leads**: Bill Pike (william.pike@pnnl.gov) and Paul Whitney (paul.whitney@pnnl.gov)

UPCOMING EVENTS

The FPGI is hosting an International Workshop on High Performance Computing, Networking and Analytics for the Power Grid at the SC11 conference in Seattle, Wash. on November 13, 2011.

ABOUT FPGI

The Future Power Grid Initiative (FPGI) will deliver next-generation concepts and tools for grid operation and planning and ensure a more secure, efficient and reliable future grid. Building on the Electricity Infrastructure Operations Center (EIOC), the Pacific Northwest National Laboratory's (PNNL) national electric grid research facility, the FPGI will advance the science and develop the technologies necessary for meeting the nation's expectations for a highly reliable and efficient electric grid, reducing carbon emissions and our dependence on foreign oil.

Contact

For more information, please visit the FPGI website gridoptics.pnnl.gov.

or Contact Initiative Leads

Henry Huang
Tel: (509) 372-6781
zhenyu.huang@pnnl.gov

Jeff Dagle
Tel: (509) 375-3629
jeff.dagle@pnnl.gov

Pacific Northwest
National Laboratory
P.O. Box 999, K1-85
Richland, WA 99352

www.pnnl.gov

Pacific Northwest
NATIONAL LABORATORY

Proudly Operated by Battelle *Since 1965*