This June, FPGI is introducing new Focus Area leads Harold Kirkham and Ian Gorton. Ian chaired a chaired a workshop at the International Conference on Software Engineering, or ICSE, and other members presented papers and participated in a training and simulation workshop expanded their network.

HIGHLIGHTS & ACHIEVEMENTS

New Focus Area Leads

Dr. Harold Kirkham has joined Bora Akyol in leading Focus Area one. Harold joined PNNL after a distinguished career at the Edison Electric Institute, American Electric Power, and the Jet Propulsion Laboratory in Pasadena, amongst others. Harold is a Fellow of the IEEE and a member of several IEEE societies, such as Power and Energy Society.

Together with Ning Zhou, Dr. Ian Gorton is the new Focus Area two co-lead. Ian is a Laboratory Fellow in the Computational Sciences and Mathematics Division at PNNL, has published three books and 130 refereed conference and journal papers and is Senior Member of the IEEE Computer Society and Fellow of the Australian Computer Society. FPGI is honored to welcome these two renowned experts into the team!

ICSE Workshop

Focus Area two lead Ian Gorton chaired a workshop on Software Engineering Challenges for the Smart Grid, held at the International Conference on Software Engineering in Zurich. Over 20 people attended, from industry, academia and research labs in Europe and the USA. In the morning, 12 papers were presented, leading to discussions in the afternoon on the key areas where software engineering innovations are needed to build the future power grid. A subset of the

workshop participants is working on a report to summarize the findings, with the intention to submit this as a paper to a leading IEEE journal.

ICSE 2012
June 2-9, 2012
Zurich • Switzerland

Publications

- Selim Ciraci, Oreste Villa, "Ser++: An Automatic Framework for Object Serialization Code Generation", submitted to Compsac 2012.

- Ning Lu, Pengwei Du, Frank Greitzer, Xinxin Guo, Ryan Hohimer, Yekaterina Pomiak, "A Multi-layer, Data-driven Advanced Reasoning Tool for Intelligent Data Mining and Analysis for Smart Grids," submitted to the 2012 IEEE PES General Meeting, San Diego, CA, USA, 2012.

- Shuangshuang Jin, Yousu Chen, Mark Rice, Yan Liu, Ian Gorton, "A Testbed for Deploying Distributed State Estimation in Power Grid," Submitted to IEEE PES General meeting 2012, PNNL-SA-84535.

- Tom Ferryman, David Haglin, Maria Vlachopoulou, Jian Yin, Chao Shen, Frank Tuffner, Guang Lin, Ning Zhou, and Jianzhong Tong, "Net Interchange Schedule Forecasting of Electric Power Exchange for RTO/ISOs," Submitted to IEEE PES General meeting 2012. PNNL-SA-84231.

ATES

Jereme Haack from Focus Area one presented Voltron at the Agent Technology for Energy Systems (ATES) workshop of the AAMAS conference. Voltron introduces agent frameworks for the power grid. Currently, no similar frameworks that support the requirements of the power grid exists, which was confirmed by several of the workshop's participants. Other solutions presented did not address security and resource management to the level of the Voltron system. A recurrent theme at both workshop and conference was that agent based approaches were a natural fit for the decentralized nature of the power grid. Voltron fills an important niche for supporting this effort by providing a place for these agent solutions to operate. Jereme will be presenting his findings at a brown bag lunch at PNNL shortly.

Gariann Gelston and Angela Dalton from Focus Area 3 (Project Title: *Decision Support for Future Power Grid Organizations*) participated in a training/simulation session at PJM Interconnection's Milford Training Center on Thursday June 21st.

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 Harold Kirkham (harold.kirkham@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**: Ian Gorton (ian.gorton@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)

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**.

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Future Power Grid Initiative

Enabling a **Resilient** and **Efficient** future power grid

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