

## High-performance Computing for Future Power and Energy System

Panel Organizers: Dr. Shuangshuang Jin, Dr. G. Kumar Venayagamoorthy, Clemson University, USA

When: Friday, September 7<sup>th</sup>, 2018, 10.30 am – 12.15 pm

Where: Ballroom B

The electric power and energy system has been evolving over the last 120 years from a single power line to today's large networks. The evolution will continue at an accelerated speed with the extensive development of smart grid technologies, the integration of intermittent renewable sources, and the deployment of distributed generations. This rapid change comprising genuine uncertainties and dramatic dynamics results in a crucial challenge for the analysis and operation of the power grid.

While current analysis tools employed in today's power grid operations are mostly on serial computers, which creates a bottleneck for understanding the power grid characteristics and providing effective decision support in real-time, high-performance computing (HPC), on the other hand, holds a promise to overcome this technical barrier to enable the operating of such a dynamic complex grid with sufficient reliability and efficiency.

This panel will consist of presentations and discussions by academia and industry experts to give a broad coverage of HPC's opportunities, challenges, benefits, and implementations for the future power and energy system in terms of grid modeling and simulation, distributed energy management, real-time grid analysis and operation, and software tool development, etc.

### Panelists:

- High Performance Computing Applications in Power Grid: Past, Present, and Future  
*Shrirang Abhyankar, Argonne National Laboratory, USA*
- Bringing High Performance Computing to the Power Grid  
*Bruce Palmer, Pacific Northwest National Laboratory, USA*
- Methods to achieve faster-than-real-time state estimation using HPC  
*Mike Mazzola, University of North Carolina Charlotte, USA*
- Handling Uncertainties via Situational Intelligence  
*G. Kumar Venayagamoorthy, Clemson University, USA*
- Development and Application of a Digital Twin  
*Joe Canterino, Siemens Power Technologies International, USA*