THE WSU-PNNL ADVANCED GRID INSTITUTE

OPEN-SOURCE HIGH-PERFORMANCE GRID OPTIMIZATION, SIMULATION, AND VISUALIZATION TOOLS @ PNNL

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ABSTRACT

This talk will present several open-source tools developed at PNNL for large-scale grid simulation, optimization, and visualization. The Exascale Grid Optimization (ExaGO) toolkit is a tool for solving stochastic, security-constrained, multi-period AC optimal power flow problems. The GridPACK package is a high-performance simulation tool having dynamics simulation (transient stability assessments) capabilities with WECC generic models, including grid-following and grid-forming, available. Lastly, ChatGrid, an interactive visualization platform powered by ChatGPT, will be introduced to demonstrate how large language models can be used for data exploration through a rich, enhanced interactive experience.

BIO

Shrirang (Shri) Abhyankar is a senior scientist in the Optimization and Control group at PNNL. He was with Argonne National Laboratory (ANL) from 2009-2019 working with the Mathematics & Computer Science and Energy System Divisions. In 2019, he joined the Optimization and Control Group at PNNL. His research work lies at the intersection of grid modeling, numerical methods, and advanced computing. His experience spans an array of applications spanning steady state, dynamics, EMT, and co-simulation. Shri is a lead developer of several open-source tools, including ExaGO, GridPACK, and has made significant contributions to several other libraries - GridLab-D, HELICS, MATPOWER, and PETSc/TAO.