THE WSU-PNNL ADVANCED GRID INSTITUTE

APP DECONFLICTION: ORCHESTRATING DISTRIBUTED, MULTI-OBJECTIVE, MULTI-ENTITY OPERATIONS FOR POWER SYSTEMS

~ *by* ~

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Wednesday, September 24, 2025 • 10 AM – 11 AM • Join TEAMS

ABSTRACT

The ongoing transformation of the grid necessitates advanced distribution systems to integrate and orchestrate intelligent subsystems and distributed resources while also serving multiple system-level objectives such as reliability, resilience, affordability, resource adequacy, etc. A modular platform-based approach to distribution system operations technology enables operators to deploy a tailored set of best-of-breed algorithms and applications. Also, the proliferation of distributed energy resources (DERs) and increasing awareness among customers are leading to a continual growth in number of stakeholders in the distribution system - such as prosumers, resources aggregators, and microgrids that aim to leverage localized resources and access new grid economies. This rapidly changing operational environment with multiple stakeholders combined with the parallel deployment of distribution automation creates a complex distributed-control environment with applications that span ownership boundaries. This may lead to operational conflicts and unintended system behavior; hence, developing cooperative solutions and ensuring efficient, reliable operation are the emerging problems for modern distribution system operations. The GridAPPS-D Program at PNNL proposed App-Deconfliction, as a formalized approach to orchestrate multi-objective, multi-entity operations of distribution systems that can be applied when integrating new algorithms or developing customized solutions. This seminar series will provide an overview of the App-Deconfliction, including a taxonomy of concepts, strategies, and approaches for solving the app deconfliction problem along with architectural specification for operations platform. The seminar will also cover some cooperation-based deconfliction solutions to enable autonomous decision-making and present representative results, lessons-learned, and future directions.

BIO

Dr. Monish Mukherjee is a power systems research engineer at Pacific Northwest National Laboratory (PNNL), USA where he leads research in advanced distribution operations and planning, grid resiliency, microgrids and grid edge coordination. He also holds an adjunct faculty appointment at Washington State University, USA. His current research focuses on modeling, simulation and control of integrated T&D systems, integrated resource planning and power system resilience.