



THE WSU-PNNL ADVANCED GRID INSTITUTE

# APP DECONFLICTION: ORCHESTRATING DISTRIBUTED, MULTI-AGENT, MULTI-OBJECTIVE OPERATIONS FOR POWER SYSTEMS<sup>1</sup>

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ANDREW P. REIMAN

Senior Electrical Engineer

Pacific Northwest National Laboratory (PNNL)

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## ABSTRACT

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Advanced distribution systems need to integrate and orchestrate intelligent subsystems and grid-edge devices that are increasing both in number and sophistication while also serving multiple system-level objectives such as resilience, decarbonization, equity, and profitability. A modular platform-based approach to distribution system operations technology enables operators to deploy a tailored set of best-of-breed algorithms and applications. Combined with the parallel deployment and control of intelligent devices, this creates a complex distributed-control environment with applications that span ownership boundaries. Conflicts can emerge between applications that want to control overlapping sets of device setpoints. App Deconflation establishes a formalized approach to resolving these conflicts that can be applied when integrating new algorithms or developing customized solutions. This presentation will discuss the deconflation pipeline used to consistently set up and solve the deconflation problem as well as heuristic-, application-engagement-, and optimization-based solutions to the deconflation problem.

## Bio

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**Dr. Andy Reiman** is a Senior Electrical Engineer and power systems researcher at Pacific Northwest National Laboratory. He received a B.S. degree in Electrical Engineering from the University of Michigan, Ann Arbor and M.S. and Ph.D. degrees in electrical engineering from the University of Pittsburgh in Pittsburgh, PA. Andy has over ten years of industry and national lab experience. He leads a portfolio of research projects in advanced distributed-grid and grid-edge operations including software platforms, algorithms, and optimization. Andy is currently the project manager for the GridAPPS-D Project. He is also the Team Leader for the System Tools Team in the Distributed Systems Group at PNNL.



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[1] A. P. Reiman *et al.*, "App Deconflation: Orchestrating Distributed, Multi-Agent, Multi-Objective Operations for Power Systems," in *IEEE Access*, vol. 11, pp. 40314-40327, 2023, doi: 10.1109/ACCESS.2023.3269422.