



PSERC WEBINAR

Coordination in Decentralized Grids

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Increasing penetration of DERs and other factors are making the centralized control (CC) model inadequate. Localized voltage regulation involving reactive power support is increasingly required, and network connections to control centers are reaching their physical limits as new DERs are deployed. CC-based monitoring and control has many challenges, including large amounts of measurement data, large sets of system variables, and slower responses of control actions. However, completely local control is based only on local disturbances, has limited network visibility, and can cause cascading effects on neighboring areas. What is required is more power computations being pushed to the edges (substations) to provide fast and scalable hierarchical control. However, decentralized coordination (including consensus) is inherently very complicated for computer science experts, let alone those without such training. In this seminar we explain the coordination issues involved with such coordination that is required by decentralization. We then overview our coordination platform and a number of decentralized power algorithms, including decentralized state estimation, distributed voltage stability, and decentralized remedial action schemes. This is joint work with Prof. Anurag Srivastava.

SEPTEMBER 3, 2019

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2:00-3:00 P.M. EDT

(11:00-12:00 P.M. PDT)

Dr. David E. Bakken is a Professor of Computer Science at Washington State University. His expertise is in distributed computing, mainly middleware platforms. Since 1999 he has worked closely with WSU's power program on helping improve information and communication technology (ICT) for the grid. This has included GridStat, a publish-subscribe framework offering high enough performance and fault tolerance for RAS and distributed control; the remote testing framework Erkios, the distributed coordination platform DCBlocks, the cloud platform GridCloud (with Cornell), and others. Prior to WSU he was a DARPA PI at BBN, the company that built the first internet (the ARPANET) in 1969 and the first middleware starting in 1979. Dr. Bakken also worked at Boeing (Commercial) in Seattle as a software engineer.

