ABSTRACT

The growing complexity of aging electric power infrastructure and the integration of intermittent distributed energy resources (DERs) pose a significant challenge to the system operation and control. New solutions (including architectural designs, control schemes, communications protocols etc.) are required for enhanced situational awareness and decision support with the increasing grid complexity. These solutions need to be validated for different possible scenarios before deploying in the field. End-to-end cyber-physical power system modeling and analytics allows for such evaluations and validations but require intensive investment in hardware, software, and labor. The goal of GridSandbox is to enable researchers with limited expertise on simulators and other software in related domains to explore, develop, and validate potential solutions with automated workflow management via a user-friendly web interface. This talk aims to introduce GridSandbox, transmission-distribution-cyber modeling, the web interface, and relevant use cases including synchrophasor data analytics and transactive energy systems.
Dr. Srivastava serves as chair of the IEEE Power & Energy Society’s (PES) PEEC committee, co-chair of the microgrid working group, vice-chair of power system operation SC, chair of PES voltage stability working group, chair of PES synchrophasors applications working group, co-chair of distributed optimization application in power grid, vice-chair of tools for power grid resilience TF, and member of CIGRE C4C2-58 Voltage Stability, C4.47/ C2.25 Resilience WG. He is serving or has served as an editor of the IEEE Transactions on Smart Grid, IEEE Transactions on Power Systems, IEEE Transactions on Industry Applications, and Elsevier Sustainable Computing and guest or past editor for numbers of other IEEE Transactions and IET Journal. Additionally, Dr. Srivastava is the author of more than 300 technical publications, including a book on power system security, and possesses four patents.

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