PSERC Power Systems Engineering Research Center

PSERC WEBINAR

Modeling Challenges and Opportunities in Transient Simulations for Power Systems with Large Penetration of Converter-Interfaced Generation

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The integration of converter-interfaced generation (CIG) from renewable energy sources poses new challenges in studying electric power systems' stability and transient behavior. While understanding the dynamic behavior of low-inertia power systems is critical to addressing these stability questions, the modeling details for reliable stability assessments are still under development. Additionally, the limited availability of open-source modeling tools for researchers explicitly geared towards large scale low-inertia systems further restricts these explorations. The first part of this talk discusses the high-level objectives of a software tool to provide flexibility in modeling low-inertia systems, focusing on Scientific Computing principles. We leverage the Julia computing language to enable the separation of models between solution algorithms and component specifications. The second part will focus on our current work in PowerSimulationsDynamics.jl (PSID.jl), the open-source Julia package implementation of the models. We will discuss its data structure and software architecture, providing a qualitative comparison with other available packages. Finally, we will showcase a simulation and implementation of a test-case using PSID.jl, comparing results with available power systems packages.

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LINK TO WEBINAR

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

Duncan Callaway is an Associate Professor of Energy and Resources at the University of California, Berkeley. He is also a faculty affiliate in Electrical Engineering and Computer Science, and a faculty scientist at Lawrence Berkeley Laboratory. He received his PhD from Cornell University. He has held engineering positions at Davis Energy Group and PowerLight Corporation, and academic positions at UC Davis, the University of Michigan and UC Berkeley. Duncan teaches courses on electric power systems and at the intersection of statistical learning and energy. His research focuses on grid integration of renewable electricity and models and control strategies for demand response, electric vehicles and electricity storage.