2020 PSERC Summer Tutorials

Power System Application of Measurement-Based Modal Analysis

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For decades modal analysis has been used in power system analysis to assess small signal stability. Traditionally, this has been done using model-based eigenvalue analysis. More recently measurement-based techniques have emerged and are now widely used. This tutorial provides an overview of this topic, with a particular focus on showing how these techniques can be easily applied to large-scale system measurements and how results can be best visualized. While a number of approaches will be considered, the main focus will be on an algorithm known as the Iterative Matrix Pencil (IMP). The tutorial will show how the IMP can be applied to systems with a large number of signals, and how the quality of the results can be verified. An application of the technique for power system stabilizer design will also be considered. The approach will be demonstrated on several electric grid models with sizes to 80,000 buses.

JULY 28, 2020 | 3:00-4:30 P.M. EDT
LINK TO TUTORIAL   (12:00-1:30 P.M. PDT)

Thomas J. Overbye is professor and holder of the Erle Nye '59 Chair for Engineering Excellence in the Department of Electrical and Computer Engineering at Texas A&M University (TAMU). Prior to joining TAMU in 2017 he was a Fox Family Professor at the University of Illinois at Urbana-Champaign. He received his BS, MS, and Ph.D. degrees in Electrical Engineering from the University of Wisconsin-Madison. Before starting his academic career he was employed with Madison Gas and Electric Company. He is the original developer of PowerWorld Simulator, a co-founder of PowerWorld Corporation, and an author of a widely used Power System Analysis and Design book. He was also the recipient of the Alexander Schwarzkopf Prize for Technological Innovation, a University of Wisconsin-Madison College of Engineering Distinguished Achievement Award, the IEEE Power and Energy Society Outstanding Power Engineering Educator Award, and is a member of the US National Academy of Engineering.