

Wide Area Monitoring of Power Systems, Dynamic State Estimation and Observability Analysis

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Abstract:

In this talk, we will present an overview of a wide-area monitoring framework for the power system states, taking advantage of both existing SCADA as well as synchronized phasor measurements. Synchronized voltage and current measurements provided by phasor measurement units (PMU) facilitate development of new and improved monitoring capabilities for the power grids. Despite the fact that there has been a drastic increase in the number of PMUs deployed in power transmission systems, numbers still remain insufficient for most systems to make them completely observable solely by synchronized measurements. Hence, we will present two possible frameworks, one which reflects current situation with a hybrid (SCADA and PMU) measurement model and the other looking ahead to a system monitored solely based on PMU measurements. We will then review the extension of these estimators to incorporate generator dynamics and the required changes to be implemented in the associated observability analysis. Finally, we will remark on the importance of developing software tools for maintaining a network database that is free of model parameter errors.

Biography:

Ali Abur received his B.S. degree at Orta Doğu Teknik Üniversitesi, Ankara, Turkey and M.S. and Ph.D. degrees from The Ohio State University, USA. He joined the Department of Electrical



Engineering at Texas A&M University where he worked as a Professor between 1985 and 2005. In 2005, he moved to the Department of Electrical and Computer Engineering at Northeastern University in Boston where he is currently a professor. He co-authored the book “Power System State Estimation” and published technical papers and reports on the same topic. He served as an Editor for IEEE Transactions on Power Systems between 1999 and 2011. He is a Fellow of the IEEE and Distinguished Lecturer for PES.