

IEEE BDA Tutorial Series: Big Data & Analytics for Power Systems

Tracking Faults and Network Model Changes Using Phasor Measurements

Prof. Ali Abur
Northeastern University



10:00 am-11:30 am, Monday, Mar. 29, 2021, Pacific Time
(6:00 pm - 7:30 pm, Monday, Mar. 29, 2021, Central European Time)

Abstract: Phasor measurement units (PMU) are rapidly populating substations and providing valuable data and measurements. These are streamed at much faster rates and in a synchronized manner compared to the existing supervisory control and data acquisition (SCADA) measurements. In this tutorial, we will discuss potential network applications which can benefit from availability of such measurements. We will first describe a fault location procedure which relies on voltage measurements provided by a limited number of PMUs to detect and locate faults on any of the transmission lines in a large power grid. This approach also takes advantage of the “Dantzig selector” estimator to formulate and solve this problem. The same approach will then be used to solve the problem of detecting unreported topology changes in external networks. This problem is particularly important for real-time contingency analysis of interconnected power grids when ICCP links fail and real time data are temporarily or permanently not available from neighboring systems. Finally, we will present a tracking estimator for non-transposed three phase transmission line model parameters based on PMU measurements which will enhance the performance of control and protection functions relying on accurate line models.

Bio: 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. 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 served as the department chair until 2013. He is currently a professor in the same department. He is a Fellow of the IEEE.

Link: <https://asu.zoom.us/j/5513218843>