TEXAS A&M UNIVERSITY
Department of Electrical & Computer Engineering

TRANSFORMING ENGINEERING EDUCATION

ENERGY & POWER GROUP SEMINAR

System Frequency Response Estimation with Discontinuity Constraints in Governor Dynamics

Abstract

Accurately predicting the frequency nadir and estimating the overall frequency trajectory is a crucial analytical task in power system planning, enabling engineers to identify risks for frequency instability and identify corrective actions. Because of the large number of operating scenarios and contingency events that need to be considered, low-order modeling frameworks have been recently developed to capture estimated average system frequency (ASF) response for a scenario and avoid time-consuming full dynamic simulation for a large, complex system. A major technical limitation in getting existing low-order models to accurately represent realistic system response is their inability to include inherent discontinuities such as limits, piecewise functions, and deadbands. To address these challenges, this seminar presents a new formulation that integrates both physical and logical discontinuity constraints into the ASF framework. By doing so, the proposed framework significantly enhances the accuracy of system configuration and system frequency response estimation, while retaining fast computational performance.

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Friday, February 14
11:30 am
241 ZACH

Biography

Jongoh Baek received his B.S and M.S. degree in electrical engineering from Kyungpook National University in South Korea and is pursuing his Ph.D. degree in electrical and computer engineering at Texas A&M University. His current research interests include power system dynamics, impacts of Inverter-Based Resources (IBRs) on power system stability, and the development of synthetic power grids, enhancing our understanding of dynamic system behavior.

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