TEXAS A&M UNIVERSITY
Department of Electrical & Computer Engineering

TRANSFORMING ENGINEERING EDUCATION

ENERGY & POWER SEMINAR

A Tuning Method for Exciters and Governors in Realistic Synthetic Grids with Dynamics

Abstract

Synthetic grids are fictitious power system models which statistically resemble actual grids, but do not contain non-public data and hence can be freely shared. This paper focuses on how to tune exciters and governors for realistic synthetic grids. In order to create stable and realistic systems, the parameters of these controllers are sampled from a realistic distribution to satisfy the stability indexes. Of the various types of stability index, three types are used for this paper: the damping ratio, the phase margin, and the gain margin. These indexes can be obtained from frequency response of open-loop system and eigenvalue analysis of closed-loop system. Statistics from actual grids are used to determine machine dynamics and some acceptable parameter ranges for governor models. The introduced synthetic dynamics of generators are applied to publicly available, 37-bus, Hawaiian synthetic power systems and its performance is verified through several disturbances (3-phase balance fault, the change of the exciter set point, and generator outage).

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Friday, October 13
11:30 am - 12:20 pm
244 ZACH

Biography

Jongoh Baek received his B.S and M.S. degree in electrical engineering from Kyungpook National University in Korea and is pursuing his Ph.D. degree in electrical and computer engineering at Texas A&M University in United states. His current research interests include power system dynamics, impacts of integration of renewable generation on power system stabilities, and the development of synthetic power grid models, enriching our understanding of dynamic system behavior in this context.

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