

HKIAS Distinguished Lecture Series on Electronics and Photonics

Challenges of Modern Power Grid in the Midst of Deepening Power Electronics Penetration and Increasing Renewable Energy Use

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Date : 12 April 2022 (Tuesday)

Time : 3:00pm - 4:30pm

Please visit the HKIAS website at www.hkias.cityu.edu.hk to register for this online lecture via zoom.



Prof. Stella W. Pang
1 March 2022 (Tue)

Prof. Kwai Man Luk
17 March 2022 (Thu)

Prof. Din-ping Tsai
30 March 2022 (Wed)

Prof. Michael C. K. Tse
12 April 2022 (Tue)

Prof. Chi Hou Chan
22 April 2022 (Fri)

Abstract

The penetration of power electronics into power generation and distribution systems has deepened in recent years, as prompted by the increasing use of renewable sources, the quest for higher performance in the control of power conversion, as well as the increasing influence of economic plans that necessitate power trading among different regions or clusters of power distribution. As a result of the increased use of power electronics for controlling power flows in power systems, interactions of power electronics systems and conventional synchronous machines' dynamics would inevitably cause stability and robustness concerns, which can be readily understood by the coupling effects among interacting dynamical systems of varying stability margins (or transient performances). In this talk, we discuss the various problems of power electronics penetration into power grids and the implications on the stability and robustness of power networks. We specifically attempt to bring together two distinct perspectives, namely, bottom-up (local) and top-down (global) perspectives, and examine the current progress and future direction of research in power systems amidst the extensive deployment of power electronics.

Biography

C K Michael Tse received the BEng (Hons) degree in electrical engineering and the PhD degree from the University of Melbourne, Australia, in 1987 and 1991, respectively. He is currently Associate Vice President and Chair Professor of Electrical Engineering with City University of Hong Kong. His research interests include power electronics, nonlinear systems, and complex network applications. Prof. Tse was the recipient of some research and industry awards, including Prize Paper Awards by IEEE Transactions on Power Electronics in 2001, 2015, and 2017, two Gold Medals at the International Inventions Exhibition in Geneva, Switzerland, in 2009 and 2013, a Grand Prize and Gold Medal at the Silicon Valley International Invention Festival in 2019, and a number of recognitions by the academic and research communities, including honorary professorship by several Chinese, Canadian and Australian universities, the Chang Jiang Scholar Chair Professorship, the IEEE Distinguished Lectureship, the Distinguished Research Fellowship by the University of Calgary, the Gledden Fellowship, and the International Distinguished Professorship-at-Large by the University of Western Australia. He was the Editor-in-Chief for the IEEE Transactions on Circuits and Systems II from 2016 to 2019 and IEEE Circuits and Systems Magazine from 2012 to 2015, and on the editorial boards of a few top-notch journals. He chaired/served on a number of IEEE committees, government committees and grant panels.



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Supported in part by: 光華教育基金會 Kwang Hua Educational Foundation