

学术报告会

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Glocal Control: Concept, Fundamental Theory, and Applications to Energy Management Systems

Shinji Hara

The University of Tokyo, Japan



Abstract:

"Glocal Control" means that the global purpose is achieved by only local actions of measurement and control in relatively large-scale dynamical systems such as energy networks, transportation systems, biological systems, and multi-agent dynamical systems. The key for realization of glocal control is hierarchical networked dynamical systems with multiple resolutions in time/space/frequency/level depending on the hierarchical layer. After explanation of the concept of glocal control, we first introduce a unified framework for hierarchical networked dynamical systems towards glocal control. We then show some fundamental results on stability and robust stability, and focus on how to design hierarchical decentralized control in this framework. Some applications related to energy network systems are demonstrated at the end of the talk.

Biography:

Shinji Hara received the B.S., M.S., and Ph.D. degrees in engineering all from Tokyo Institute of Technology, Tokyo, Japan, in 1974, 1976, and 1981, respectively. In 1984, he joined Tokyo Institute of Technology as an Associate Professor and has served as a Full Professor for ten years. Since 2002 he has been a Full Professor of the Department of Information Physics and Computing, The University of Tokyo. His current research interests are in robust control, decentralized cooperative control for large-scale networked dynamical systems, system biology, glocal control. Dr. Hara received the George S. Axelby Outstanding Paper Award from the IEEE Control System Society in 2006. He was the President of SICE in 2009 and the Vice-President of the IEEE CSS in 2009-2010, IFAC Council member in 2012-, and Fellow of IFAC, IEEE and SICE.