

Systems and Control Seminar
Tokyo Institute of Technology

Cooperative Control and Plug-&-Play Operation of Heterogeneous Nonlinear Systems

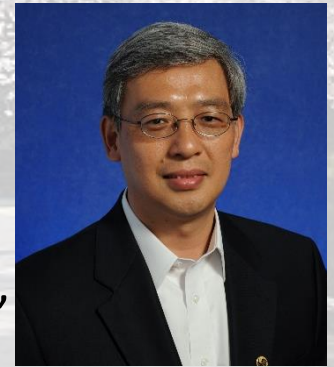
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Abstract: In many applications, heterogeneous dynamic systems are expected to interact with each other through Ethernet and wireless communication networks and with various smart sensors, and these systems are expected to operate autonomously. The talk focuses upon modularized design tools for developing distributed and network-enabled cooperative control algorithms such complex cyber-physical systems. By using a simple impact coefficient to quantify interactions among heterogeneous nonlinear systems, a fully modular design methodology is presented to separately design individual feedback controls of physical systems and network-level cooperative control, and their combination enables plug-&-play operation of these networked systems. Sample results will be presented to illustrate effectiveness in such civilian applications as self-organizing microgrids.
