

## Editorial

Mingcong DENG

Department of Systems Engineering,  
Okayama University,  
3-1-1 Tsushima-Naka,  
Okayama, 700-8530, Japan  
Email: deng@suri.sys.okayama-u.ac.jp

Welcome to the special issue composed of selected papers from the 2009 IEEE International Conference on Networking, Sensing and Control (ICNSC'09). ICNSC'09 was held at the Okayama University, Japan, March 26-29, 2009. A total of 211 papers were submitted to this conference from different parts of the world. The final program includes 173 papers among which 92 are the contributed papers and 81 are special papers. From this conference, six technical contributions of high quality on intelligent control and system are selected into this special issue. The main contents of the papers are briefly described as follows.

Adaptive Output Following Control of a Networked Thermal Process' by Deng, Wen and Inoue. In this paper, adaptive output following control based on command generator tracker is proposed for a networked aluminium plate thermal process. The system with time delays is approximated as high order lag system. A fixed output feedback gain is derived to guarantee robust stability of the system. An adaptive following control scheme is investigated to deal with the effect of network delays and uncertainties. Simulation and experimental results show the effectiveness of the proposed design scheme compared with non-adaptive control approach.

Using Congestion Graphs to Analyze the Stability of Network Congestion Control' by Hobson-Garcia and Hayakawa. The authors define a matrix equation to represent the queue dynamics of a congestion control network by using a set of graphs in this paper. A Lyapunov-Krasovskii functional is presented to prove the asymptotic stability of first-order delay differential dynamical system under the constraint that the control gain is less than unity. And this method is extended to the numerical study of high-order system. The proposed method is less conservative than some frequency domain analysis

for a second-order delay-differential system.

A Design Method of Two Degree-of-Freedom of Self-Tuning GPC Based on State Space Approach Using a Genetic Algorithm' by Yanou. This paper presents a new self-tuning generalized predictive control (GPC) scheme for two degree-of-freedom system based on genetic algorithm. In general, the integral gain must be selected according to trial and error. To resolve this problem, a genetic algorithm is researched to derive the optimal gain.

Dynamic Operation Permission System for Oil Refinery Plants' by Gofuku and Sato. In this paper, the authors propose a concept called dynamic operation permission to support safety operation of nuclear power plants. A proto-type system based on dynamic operation permission for oil refinery plants is developed and described as an agent system, where the operation permission is determined by typical operations described in operation manuals and the influences of an operation on plant future behavior are estimated by using an MFM model. Its applicability is investigated by some examples of dynamic operation permission.

Stochastic Distribution Control Strategy with Application to Networked Control Systems' by Zhang and Wang. In this paper, a minimum error entropy criterion is utilized to design controller for non-linear networked control systems (NCS), where time delays in the communication channels are random. The induced random delays are approximated by Pade approximation. The analytical formula of optimal control is established and a recursive control algorithm is investigated based on the stochastic distribution control strategy. The local stability condition of the closed loop NCS is established. Simulation results show the effectiveness and applicability of the proposed approach.

