上海交通大学自动化系
Department of Automation
Shanghai Jiao Tong University

系统控制与信息处理教育部重点实验室
Key Laboratory of System Control and Information Processing, Ministry of Education

学术报告会

时　间：6月29日(周五) 10:00-11:00

地　点：电院群楼2-410会议室

Interval Type-2 Fuzzy-Model-Based Control Systems: Modeling, Stability Analysis and Applications

Hak-Keung Lam

King's College London

Abstract:

This talk gives a brief introduction of interval type-2 (IT2) fuzzy-model-based (FMB) control systems. It starts with the rationale why IT2 fuzzy logic is needed and is then followed with some preliminaries of IT2 fuzzy logic. A model-free IT2 application on automatic drug administration for anaesthesia will be shown to demonstrate that IT2 fuzzy logic controller is a good candidate to tackle complex nonlinear control applications. The concerns about IT2 fuzzy modeling are then discussed, which is an important component to support the control design and system analysis. The techniques of membership-function-dependent analysis are presented to analyze the system stability of IT2 FMB control systems. Simulation and practical examples will be given to verify the merits and demonstrate the applicability of the developed theory and IT2 fuzzy control strategy.

Biography:

H. K. Lam received the B.Eng. (Hons.) and Ph.D. degrees from the Department of Electronic and Information Engineering, The Hong Kong Polytechnic University, Hong Kong, in 1995 and 2000, respectively. During the period of 2000 and 2005, he worked with the Department of Electronic and Information Engineering at The Hong Kong Polytechnic University as Post-Doctoral Fellow and Research Fellow respectively. He joined as a Lecturer at King's College London in 2005 and is currently a Reader. His current research interests include intelligent control and computational intelligence. He has served as a program committee member, international advisory board member, invited session chair and publication chair for various international conferences and a reviewer for various books, international journals and international conferences. He is an associate editor for IEEE Transactions on Fuzzy Systems, IEEE Transactions on Circuits and Systems II: Express Briefs, IET Control Theory and Applications, International Journal of Fuzzy Systems and Neorocomputing; and guest editor for a number of international journals. He is in the editorial board of Journal of Intelligent Learning Systems and Applications, Journal of Applied Mathematics, Mathematical Problems in Engineering, Modelling and Simulation in Engineering, Annual Review of Chaos Theory, Bifurcations and Dynamical System, The Open Cybernetics and Systemics Journal, Cogent Engineering and International Journal of Sensors, Wireless Communications and Control. He is an IEEE senior member. He is a coeditor of two edited volumes: Control of Chaotic Nonlinear

Circuits (World Scientific, 2009) and Computational Intelligence and Its Applications (World Scientific, 2012), and author/coauthor of three monographs: Stability Analysis of Fuzzy-Model-Based Control Systems (Springer, 2011), Polynomial Fuzzy Model Based Control Systems (Springer, 2016) and Analysis and Synthesis for Interval Type-2 Fuzzy-Model-Based Systems (Springer, 2016).