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Automatic
Control and
Systems
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The Department of Automatic Control & Systems Engineering
is pleased to announce the following joint seminar:

Adaptive Parameter Estimation via Parameter Error: A new perspective

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Wednesday, 28 September 2016 at 14:30

LT02, Sir Henry Stephenson Building

Abstract

The well-known system identification or parameter estimation methods have mainly been designed based on the gradient and least squares algorithms. Thus, an observer or predictor should be used to create output error to update the estimated parameter. However, the proof of error convergence, robustness analysis and the online verification of the required persistent excitation (PE) condition are not trivial in this framework.

In this talk, we will introduce a novel robust, fast adaptive parameter estimation framework for continuous-time systems, where the parameter estimation error between the unknown parameters and their estimates are explicitly obtained and then use to drive several online learning algorithms. This idea even allows to achieve finite-time parameter estimation. Moreover, we will introduce an intuitive and numerically feasible approach to online verify the PE condition. Finally, several practical examples of this new adaptation algorithm in application to the real-time estimation of in-car parameters, the control of humanoid robotics and the synthesis of adaptive optimal control will be presented.

Biography

Jing Na is currently a Marie Curie Fellow at the Department of Mechanical Engineering, University of Bristol (UK). He received the B.S. and Ph.D. degrees from the School of Automation, Beijing Institute of Technology (Beijing) in 2004 and 2010, respectively. Since 2010, he has been with the Faculty of Mechanical and Electrical Engineering, Kunming University of Science and Technology (Kunming), where he was promoted to be a Professor in 2013. He has also worked as a Principality of Monaco/ITER Postdoctoral Fellow in the ITER Organization from 2011 to 2012, focusing on the modeling, identification, control and dynamic simulation of large scale cryogenic systems.

His current research interests include adaptive parameter estimation, intelligent control, repetitive control, and nonlinear control and applications. He has published more than 80 peer-reviewed journal and conference papers.

*Light refreshments will be served in the
foyer of the Sir Henry Stephenson Building following the seminar*