Call for Papers
IET Control Theory & Applications

Editor-in-Chief: James Lam, University of Hong Kong

Special Issue:
Data-driven Control, and Data-Based System Modelling, Monitoring, and Control

In modern industrial processes, aerospace systems, vehicle systems, and elsewhere there are increased demands for fuel efficiency, conservation of resources, cost and energy savings, and other optimal performance requirements. However, there is generally no dynamical model available of the process, or the process model is too complex to be tractable for controller design. Modeling and system identification are expensive and time-consuming, and models may be time-varying, or nonlinear, or contain delays. The term ‘Data-driven Control’ (DDC) originated in the 1990’s in Computer Science and it shares the same context as ‘big data’, ‘data mining,’ and ‘data fusion’. On the other hand, Data-Based System Modeling, Monitoring, and Control is a set of topics used in the Control Systems community.

The development of all these topics was driven by the huge amounts of data measured in complex process control systems, both stored historical data from prior measurements and on-line data available in real time during process runs. In these fields, the in-tent is to efficiently use the information in huge amounts of process input/output data to design predictors, controllers, and monitoring systems that provide guaranteed performance of the process. Given the process industry’s interest in data-driven techniques, their relevance to the objectives of system and control theory, and the fact that many techniques developed over many years for automatic feedback control have similar aims, the goal of this Special Issue is to provide a forum to bring together different ideas related to DDC and Data-Based System Modeling, Monitoring, and Control from different disciplines in order to seek a unified framework for further thought about these topics.

SCOPE OF THE SPECIAL ISSUE
We invite original contributions related to DDC and data-based modelling, monitoring, and control.

Topics include but are not limited to:
- Data-based model-free adaptive control
- Adaptive inverse control
- Iterative learning control
- Data-based modelling and prediction
- Monitoring and fault detection
- Data-driven optimization
- Stochastic and statistical methods for data-based modelling and control
- Reinforcement Learning for real-time optimization
- Approximate Dynamic Programming
- Autotuning
- Cognitive computing and intelligent control for DDC and data-driven optimization
- New data-based structures from neurocognitive psychology studies
- Data-based methods for fast decision, monitoring, and control in dynamic environments
- Data based methods for attack detection and monitoring in Cyberphysical systems
- Neural network learning control in model-free environments

All submissions are subject to the journal’s peer-review procedures. The authors should follow the journal’s Author Guide at http://digital-library.theiet.org/journals/author-guide when preparing papers for submission to the Special Issue.

For enquiries regarding this Special Issue please contact the Guest Editors:

Y.D. Song
Chongqing University, China
E: ydsong@cqu.edu.cn

Jinliang Ding
Northeastern University, Shenyang, China

T.Y. Chai
Northeastern University, Shenyang, China

S. Jagannathan
Missouri University of Science and Technology, USA

F.L. Lewis
University of Texas at Arlington, USA

Important dates:
Submission deadline: 31 Aug 2015
Publication Date: Aug 2016

All papers must be submitted through the journal’s Manuscript Central system:
http://mc.manuscriptcentral.com/iet-cta
About our Special Issue Guest Editors

**Yongduan Song** received his Ph.D. degree in electrical and computer engineering from Tennessee Technological University, Cookeville, USA, in 1992. He is now a chair professor and the Dean of School of Automation, Chongqing University. His research interests include intelligent systems, guidance navigation and control, bio-inspired adaptive and cooperative systems, rail traffic control and safety, and smart grid.

**Jinliang Ding** received his Ph.D degrees in Control Theory and Control Engineering from Northeastern University, Shenyang, China, in 2012. He is currently a Professor and his research interests include data-based modelling, control and optimization for the complex industrial systems, intelligent optimization and applications. He has published more than 70 papers and received the CEP Best Paper Award of 2011-2013.

**Tianyou Chai** received his Ph.D. degree in control theory and engineering in 1985 from Northeastern University, Shenyang, China. He is now a chair professor and a member of Chinese Academy of Engineering, IFAC and IEEE Fellow, director of Department of Information Science of National Natural Science Foundation of China. His research interests include industrial modeling, control and optimization.

**Dr. S. Jagannathan** is at the Missouri University of Science and Technology where he is a Rutledge-Emerson Endowed Chair Professor of Electrical and Computer Engineering. He has coauthored 129 journal, 235 conference articles, several book chapters, 3 books and holds 20 US patents. He is a Fellow of the Institute of Measurement and Control, UK.


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Contact us:

IET Control Theory & Applications
IET Research Journals Dept.
Michael Faraday House
Six Hills Way
Stevenage
SG1 2AY
United Kingdom

Kruna Vukmirovic, Executive Editor (IET Research Journals)
T: +44 (0)1438 765504
E: iet_cta@theiet.org

www.ietdl.org/IET-CTA

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