

UTC INSTITUTE FOR ADVANCED SYSTEMS ENGINEERING FACULTY CANDIDATE

Advanced Process Control and Global Optimization for Complex Processes

With growing attentions on the energy efficiency and environmental impacts in the chemical and manufacturing industries, the new-generation process has to be well-designed, manipulated precisely and optimized globally. Thus, this talk will focus on some new strategies developed in my previous and current research for process control, design and optimization to achieve above requirements. The successes of these methods will also be demonstrated by several industrial applications and comparisons with the conventional solution or state-of-the-art software.

First, a new nonlinear model predictive control (MPC) approach integrated with the robust control Lyapunov function (RCLF) and approximate dynamic programming (ADP) is developed to ensure the robust stability and reduce online computational demands. Second, the spectral approach with Galerkin's model reduction is applied within the MPC framework to control the distributed parameter system, modeled by the partial differential equation (PDE), to track the desired set-point and satisfy the process constraints rigorously. Third, a highly efficient global optimization method is developed for the refining process design under uncertainties, which is modeled by a large-scale mixed-integer nonlinear programming (MINLP) formulation.

Yu Yang

Dr. Yu Yang is a postdoctoral associate in the Department of Chemical Engineering, MIT. He received the PhD degree in 2011 from the Chemical Engineering Department, University of Alberta, Canada. He also obtained the Master and Bachelor degrees from Zhejiang University and Beijing Institute of Technology (BIT) in China, respectively. His research focuses on the advanced process control and efficient optimization methods for complex and large-scale processes.

Thursday, June 2, 2016

10:30am – 11:30am

UConn, Storrs Campus – ITE Building C80

[To view the live webcast at 10:30am please click here](#)

Upcoming Distinguished Lectures

10/06/16 – Olivier de Weck
When is complex too complex?
Graph energy, proactive complexity
management and the first law of
systems engineering

10/17/16 – Wei Chen
Design under uncertainty;
multidisciplinary design
optimization; simulation-
based design

Upcoming Seminars

09/08/16– Chris Ha
Think Like a Customer, Act
like a Startup in Analytics Space

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