

The 37th Chinese Control Conference

Pre-conference Workshop

Speaker: Jinfeng Liu, University of Alberta

Title: Economic Model Predictive Control



Biography: Jinfeng Liu received the B.S. and M.S. degrees in Control Science and Engineering in 2003 and 2006, respectively, both from Zhejiang University, and the Ph.D. degree in Chemical Engineering from the University of California, Los Angeles (UCLA) in 2011. After obtaining the Ph.D. degree, he worked as a postdoctoral fellow at UCLA for a few months. In 2012, he joined the faculty of the Department of Chemical and Materials Engineering, University of Alberta in Canada, as an Assistant Professor.

Dr. Liu's research interests are in the general areas of process control theory and practice with emphasis on model predictive control, networked and distributed state estimation and control, and fault-tolerant process control and their applications to chemical processes, biomedical systems, and water conservation in irrigation. He has co-authored three monographs and more than 100 journal and conference publications. A more detailed description of his research interests and a list of his publications can be found at <http://www.ualberta.ca/~jinfeng/index.html>.

Abstract: Model predictive control (MPC) has been an important and successful advanced control technology in process industries mainly due to its ability to handle effectively complex systems with hard control constraints. MPC presents a very flexible optimal control framework that can handle a wide range of industrial issues while incorporating state or output feedback. Traditionally, MPC with quadratic cost functions had dominated the focus of MPC research. Advances in technologies in the last decades have enabled us to look beyond the traditional MPC and brought new challenges and opportunities in MPC research. One important example of this

technology-driven development is economic MPC.

Economic MPC removes the separation between optimization and control in the traditional hierarchical real-time optimization systems and addresses both optimization and control in one single layer. Economic MPC optimizes a general economic cost function, which in general is not quadratic. This workshop is intended to introduce researchers to (i) the theory and design of economic MPC systems, (ii) numerical implementation of economic MPC, and (iii) applications of economic MPC to different systems.