

The 36th Chinese Control Conference

Pre-conference Workshop 2



Speaker: Biao Huang, University of Alberta ,Canada

Title: Data Analytics for Control Systems Engineering

Biography: Biao Huang obtained his PhD degree in Process Control from the University of Alberta, Canada, in 1997. He had MSc degree (1986) and BSc degree (1983) in Automatic Control from the Beijing University of Aeronautics and Astronautics. He joined the University of Alberta in 1997 as an Assistant Professor in the Department of Chemical and Materials Engineering, and is currently a Professor, NSERC Senior Industrial Research Chair in Control of Oil Sands Processes and AITF

Industry Chair in Process Control.

He is a Fellow of the Canadian Academy of Engineering, Fellow of the Chemical Institute of Canada, and recipient of Germany's Alexander von Humboldt Research Fellowship and Chinese Education Ministry's Chang Jiang Scholar, Syncrude Canada Innovation Award, Bantrel Award in Design and Industrial Practice, DG Fisher Award, APEGA's Summit Award in Research Excellence, University of Alberta's McCalla and Killam Professorship, Petro-Canada Young Innovator Award ,and a best paper award from Journal of Process Control.

Biao Huang's research interests include: Bayesian inference, system identification, control performance assessment, fault detection and isolation, and soft sensors. He has applied his expertise extensively in industrial practice. He is Deputy Editor-in-Chief for IFAC Journal Control Engineering Practice and Associate Editor for Journal of Process Control and Canadian Journal of Chemical Engineering.

Abstract: Modern industries are awash with large amount of data. Extraction of information and knowledge discovery from data for control system design, particularly from day by day routine process operating data, is especially challenging. There exist numerous challenging issues such as data nonlinearity, non-Gaussian distributions, high dimensionality, collinearity, multiple modal operations, outlying points, missing measurement etc that must be considered during the information extraction process. This presentation will discuss state-of-the-art development of data analytics to deal with these issues and to develop predictive models, soft sensors and fault detection and diagnosis monitors from data. The theory of robust data analytics is explained. The non-Gaussian behavior of process data is discussed. The concept of data analytics is illustrated in detail by applications to data based image

processing. The successful use of data analytics for predictive modeling and soft sensing will be elaborated.