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Department of Advanced Design and Systems Engineering

Distinguished ADSE Seminar Series

Holistic Retrospective Modeling and Analysis of Multistage Manufacturing Processes

Dr. Jianjun Shi

The Carolyn J. Stewart Chair and Professor
Member of National of Academy of Engineering (NAE) of USA
Georgia Institute of Technology, USA

19 NOV 2021 (Fri) 10:30 am

Seminar Link: https://cityu.zoom.us/j/97484969681

Meeting ID: 974 8496 9681

Enquiry: 3442 8422
All are welcome

Abstract

Nowadays, multistage manufacturing processes (MMPs) are equipped with complex sensing systems. As a result, massive heterogeneous, high dimensional, and temporal-spatial data streams are generated from those MMPs. A challenging problem is how to develop advanced data analytics methods to effectively extract important information and knowledge from those accumulated production data.

This presentation will introduce a set of holistic retrospective modeling and analysis methods, which use machine learning tools to model and identify relationships among variables, to automatically aggregate data sets to model small batch production data, to automatically identify abnormal events occurred in a production and quantify their characteristics simultaneously, to identify and rank process variables that are critical to quality response with consideration of diversity, and to identify root causes of quality issues. This presentation will discuss research opportunities, challenges, and advancements, especially how machine learning concepts and algorithms can be used in retrospective data analytics problems. Examples of ongoing research projects will be used to articulate the frontiers of this research area. All examples come from real MMPs and encountered in real production systems. All papers presented in this talk are published in 2021.

About the speaker

Dr. Jianjun Shi is the Carolyn J. Stewart Chair and Professor in H. Milton Stewart School of Industrial and Systems Engineering, with a joint appointment in the George W. Woodruff School of Mechanical Engineering, Georgia Institute of Technology. Professor Shi's research is in the area of system informatics and control. He is the founding chairperson of the Quality, Statistics and Reliability Subdivision of INFORMS. He has served as the Editor-in-Chief of the IISE Transactions (2017-2020). Dr. Shi received various awards, including the ASQ Walter Shewhart Medal (2021), The S. M. Wu Research Implementation Award from SME (2021), the Brumbaugh Award form the American Society for Quality (2019), the IISE David F. Baker Distinguished Research Award (2016), the IISE Albert G. Holzman Distinguished Educator Award (2011), Forging Achievement Award (2007), and Monroe-Brown Foundation Research Excellence Award (2007). He is a Fellow of five professional societies, including INFORMS, IISE, ASME, SME, and ISI. He is an Academician of the International Academy for Quality (IAQ), and a member of National Academy of Engineering (NAE) of USA.

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