The Department of Mechanical Engineering/College of Engineering and Applied Sciences
Stony Brook University

Mechanical Engineering Seminar

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Lecture Title: Real-Time Decision Support for Factory Control

Thursday, March 31, 2011, 2:00PM, Room 173 Light Engineering

Abstract

Decision making in real time responsiveness is gaining interests in academic and modern industry. In this presentation, a real-time information enabled factory is studied and constraint-based supervisory factory control methodology is investigated to enhance real-time decision accuracy. One key characteristic of any process performance is variability; that is, a process rarely performs consistently over time. Variability control and dynamic mitigation of bottleneck is the key to improve production performance. The short-term production performance characteristic is analyzed and short-term control frequency is investigated. This leads to optimized short-term bottleneck detection. Bottleneck or constraint based reactive maintenance (RM) prioritization and timely performances of preventive maintenance (PM) tasks are studied. A systematic method is introduced to incorporate real time information and machine failure condition to predict maintenance opportunities. The methodology can enhance real-time control to improve productivity and reduce cost. The real time control methodology can be further extended to new areas; current and future researches in Energy Management and Quality Control of Battery Manufacturing are also briefly introduced.

Biography

Dr. Qing (Cindy) Chang is currently an Assistant Professor in Department of Mechanical Engineering at New York Institute of Technology (NYIT). Before joining NYIT in 2009, she was a Senior Researcher in Manufacturing Systems Research Lab, General Motors Research & Development Center. She received BS from Beijing Polytechnic University, Beijing, China, MS from University of Wisconsin - Madison and PhD in Manufacturing Program, University of Michigan - Ann Arbor, in 1991, 1996 and 2006, respectively. She has published over 15 refereed journal articles and conference proceedings. She has received three US patents in the area of production system and control. She received General Motors Boss Kettering Awards in 2005, 2006 and 2008 respectively and The Charles L. McCuen Special Achievement Awards in 2005, 2006 and 2008 respectively. Her primary research interests are in design, analysis and control of production systems.

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