

Preventive Maintenance Optimization based on Multiple-time Component- Reassignments



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Abstract

Many modern industrial systems consist of multiple components, which are functionally exchangeable, such as Li-ion batteries for electric or hybrid-electric vehicles, tires for a car, and filters in a water treatment system. For such a system, assignment of components among positions in the system affects reliability and useful lifetime of the system. Moreover, as a system operates and its components degrade differently, the component assignment needs to be adjusted with the aim of improving system performance. The existing research studies have explored the optimization of component assignment and one-time component reassignment. Along this line of research, we study and explore potential benefits of multiple-time component reassignments before the system is overhaul and replaced. Results show that the optimal number of component reassignments can be larger than one and normally several times, considering the cost of reassignments.

About the Speaker

Xiaoyan Zhu received the B.E. degree in Energy and Power Engineering from Tsinghua University, Beijing, in 2000, and M.S. and Ph.D. degrees in Industrial Engineering from Texas A&M University, College Station, USA, in 2002 and 2005, respectively. She is a Professor in School of Economics and Management at University of Chinese Academy of Sciences, Beijing, China. She is the author of a research book on importance measures in reliability. Her research interests include modeling and data analysis, system reliability and maintainability optimization and supply chain and inventory management. She was a recipient of the IISE Best Paper Prize in Quality Control & Reliability Engineering by Institute of Industrial and System Engineers (IISE). She is a member of INFORMS and a senior member of IISE and IEEE.