

Department of Systems Engineering and Engineering Management

Seminar Series

Complex Systems Reliability Evaluation by Multi-information Fusion

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Professor

College of Information System and Management
National University of Defense Technology, PRC

Date	18 July 2016 (Monday)
Time	10:30am - 11:30am
Venue	P4704, AC1

Abstract

Modern society witnesses the ever-increasing number of complex systems, such as satellite systems, large-scale machine tools. There are also ever-increasing reliability requirements for these complex systems. To deliver a complex system with high reliability, it is necessary for the manager to track and manage its reliability throughout its life cycle. However, because of the advancement of modern technology and the increasingly high reliability requirement, available system-level lifetime data for reliability assessment of a complex system are extremely sparse due to the high costs of system-level reliability test. Thus, reliability evaluation of a complex system requires effective use of different types and different levels of data and information available throughout the life cycle, such as experts' judgments, degradation data and lifetime data. This talk is about the evaluation of the reliability of complex systems by multi-information fusion techniques. The research approach of multi-information fusion is presented. Commonly used data collection and pretreatment method are introduced. This talk shows how a complex system is divided into different units for the fusion of information from different levels and units. Methods are introduced on using the Bayesian approach for reliability assessment of units and systems with different data types and reliability information. Two particular topics are discussed. The first one is about the remaining useful life estimation of complex systems based on the reliability evaluation results. The second is about the optimization design of complex systems with redundant units is given in this talk.

About the Speaker

Bo Guo is a professor in College of Information System and Management of National University of Defense Technology (NUDT). He received the B.S degree in Mathematics from Huazhong Institute of Technology, the M.S degree in System Engineering from NUDT and the Ph.D degree in Engineering Management from Tokyo University of Science. Currently, he is the academic leader of the Group of Management Science and Engineering, the principal of National Level Teaching Team in System Engineering and Management, a member of National Educational Guidance Committee for the Postgraduate of Engineering Management, and an assessor of International Project Management Professional. His research interests include system reliability, maintenance, supportability and safety. He has received 8 provincial-level scientific and technological progress awards and 3 provincial-level teaching progress awards. He has published over 80 papers and 4 books including “Analysis of System Reliability” and “Project Risk Management”. He has successfully supervised 23 PhD students and over 100 Master students.

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All are Welcome!