

PLEASE JOIN US!!!

**Department of Engineering Management, Information,
and Systems**

Ph.D. Defense

**“A Methodology for Selecting The Preferred System of
Systems During Mission Planning and Acquisition”**

Behrokh Mokhtarpour

Dr. Jerrell Stracener, Advisor

Monday, April 27, 2015

11:00 am – 1:00 pm

(406 Caruth Hall – Palmer Conference Room)

Abstract: An increasing need to provide new capabilities, quickly and affordably, in response to continuously changing environments has given attention to the acquisition of system of systems (SoS). SoS raises unique development challenges, one of which is the process and methods for selecting the “right mix” of systems for an SoS to meet operational capability and program requirements. This dissertation presents a methodology for generating feasible SoS solutions from existing systems and selecting the preferred option for a specific mission. The methodology developed utilizes a systems engineering approach to provide a basis for decision making during planning and acquisition of a new capability through an SoS approach and enables comparison of generated SoS solutions based on factors relating to: SoS time to achieve initial operating capability (IOC), mission effectiveness, capability sustainability and affordability.

As an integral part of this methodology, an approach is presented to estimate a lower-bound mission reliability for SoS solutions operating phased-missions. This methodology also includes an efficient selection and ranking procedure that combines statistical data analysis and multi-criteria decision analysis

to scan a large number of feasible SoS solutions in a high-dimensional space and present the best SoS solution to the stakeholders.

Bio: Behrokh Mokhtarpour received both her B.S. and M.S. degrees in Industrial engineering. She is currently a Ph.D. candidate in systems engineering at the Bobby B. Lyle School of Engineering, SMU. Her current research interests include system of systems, mission reliability modeling and analysis for phased mission systems. She is currently a student member of IEEE, INCOSE, AIAA and IIE. Her research findings have been published in *IEEE Systems Journal*, *The 2015 Annual Reliability and Maintainability Symposium (RAMS)* and *2014 IEEE International Conference on Systems, Man and Cybernetics*.

Everyone is welcome!