



"SMC Papers Night"

A General Membership Meeting with Preview Presentations of 2015 International Symposium Papers

Title: Differentiating System Architectures: Applying Architecture Measures

Authors: Ronald S. Carson, PhD, INCOSE Fellow

Abstract. Having the right system architecture can facilitate system development and help manage life-cycle costs. The wrong system architecture can make these more challenging because there may be missing program activities to address the key features of the selected architecture. For example, integrated architectures may require more design integration and analysis compared with federated (modular) architectures because of the tight coupling among subsystems. In the extreme case, the wrong architecture can lead to failure to satisfy all the requirements or obviate the possibility of future enhancements.

Title: Objects, Relations and Clusters for System Analysis

Author: Joseph Simpson, Mary Simpson

Abstract. The use of Abstract Relation Types (ART) in the analysis of system structure and system component clustering is the primary focus of this paper. Two basic system definitions are presented along with two, object-clustering definitions which were obtained from a literature search. Systems structuring mathematical properties, used in systems analysis, are outlined and discussed. The ART analysis approach is applied to classical *N*-Squared Charts and Design Structure Matrices (DSM), with specific emphasis on clustering methods, types and meaning. The primary structuring relationship associated with *N*-Squared ART and DSM ART are evaluated and discussed. Multiple DSM ART solution approaches and techniques are referenced and discussed.

Title: Project Manager's Guide to Systems Engineering Measurement for Project Success

Author: Ronald S. Carson, Paul Frenz

Abstract. The INCOSE Measurement Working Group (MWG) is providing an introduction to their recently released technical product, a "Project Manager's Guide to Systems Engineering Measurement for Project Success". The guide is targeted at program/project managers and technical systems engineering leads who desire to use systems engineering technical measures to guide their programs to success.



Title: Foundational Aspects of System Complexity Reduction

Authors: Joseph Simpson, Mary Simpson

Abstract. Six foundational aspects of system complexity reduction have been derived and identified from an analysis of four methodologies for systems complexity reduction. All six of these foundational aspects are associated with uncertainty reduction in the system description process. A system is described using a formal language (mathematics). The mathematical description of the system is described and discussed using informal language (natural language). This general approach, when properly organized has demonstrated significant, measurable complexity reduction.

Title: Implementing Structured Requirements to Improve Requirements Quality

Authors: Ronald S. Carson, PhD, INCOSE Fellow

Abstract The Boeing Company has implemented a standard approach to the engineering of high-quality requirements using the concept of “structured, natural language”, a specific grammar for how to write requirements. This approach helps our requirements engineers write more unambiguous and verifiable requirements as required by ISO/IEC/IEEE 29148:2011 and related commercial and military standards.

Title: Structural Modeling Framework

Authors: Joseph Simpson, Mary Simpson

Abstract The ability to effectively and efficiently identify, model and communicate information about systems is becoming more valuable. Given an unstructured context populated with unknown and/or poorly understood systems, the application of structural modeling techniques will assist in the identification of unknown systems as well as the proper structuring of these systems. The authors expand John N Warfield’s structural modeling techniques to include a well-defined, structural integration modeling process. The primary contribution of structural integration modeling is to align basic structural modeling with interpretive structural modeling. This paper provides an overview of the previous work of the authors in this area, establishes connections between cognitive complexity reduction and structural modeling, and presents an example application. The example application demonstrates the system concepts, methods and processes identified in this paper.

Location: Founders Hall (UW1), Room-103
University of Washington, Bothell Campus
18115 Campus Way NE, Bothell, WA 98011

Date: Wednesday, 6/17/2015

Agenda: 5:30 pm - Food/Social
5:50pm - General Business Meeting
6:00pm - Presentations

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