



## Multi-Formalism Modeling of Complex Problems

**Alexander H. Levis ,**

University Professor of Electrical, Computer and  
Systems Engineering  
George Mason University  
Fairfax , USA



### Περίληψη – Abstract

The modeling of a complex problem such as the effect of cyber exploits on the performance of an organization is a complex problem and requires development and interoperation of a set of several models. Each model, developed using different modeling languages, offers unique insights and makes specific assumptions about the organization being modeled, its means of communication and the processes that it uses. Interoperation of such models can produce a more robust modeling and simulation capability to support analysis and evaluation of functional and non-functional measures such as resilience. Meta-modeling analysis based on Concept Maps and Ontologies indicates what types of interoperation are valid between models expressed in different modeling languages. The approach is illustrated through examples focusing on the use of several types of models.

**Dr. Alexander H. Levis** is University Professor of [Electrical, Computer, and Systems Engineering and heads the System Architectures Laboratory](#) in the Volgenau School of Engineering, [George Mason University](#), Fairfax, VA. From 2001 to 2004 he served as the Chief Scientist of the U.S. Air Force. He was educated at Ripon College where he received the AB degree (1963) in Mathematics and Physics and then at MIT where he received the BS (1963), MS (1965), ME (1967), and Sc.D. (1968) degrees in Mechanical Engineering with control systems as his area of specialization. For the last fifteen years, his areas of research have been architecture design and evaluation, resilient architectures for command and control, and adversary multi-modeling for behavioral analysis.

Dr. Levis is a Life Fellow of the Institute of Electrical and Electronic Engineers (IEEE) and past president of the IEEE Control Systems Society; a Fellow of the American Association for the Advancement of Science (AAAS), a Fellow of the International Council on Systems Engineering (INCOSE), and an Associate Fellow of the American Institute of Aeronautics and Astronautics (AIAA). He has over 280 publications documenting his research, including the three volume set that he co-edited on *The Science of Command and Control*, published by AFCEA, and *The Limitless Sky: Air Force Science and Technology contributions to the Nation* published in 2004 by the Air Force.

**Πέμπτη 24/09/2015 – 12:00**

**Αίθουσα Σεμιναρίων,**

**Κτίριο Μηχανικών Η/Υ & Πληροφορικής**

**Πανεπιστήμιο Ιωαννίνων**