

Johnny J. Garcia,

a doctoral student in Modeling and Simulation, will be defending his dissertation

“ADDING EXECUTABLE CONTEXT TO EXECUTABLE ARCHITECTURES: SHIFTING TOWARD A KNOWLEDGE-BASED PARADIGM FOR SYSTEM-OF-SYSTEMS ARCHITECTURES”

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Old Dominion University, Kaufman Hall, Room 239

Committee Chair:

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Committee Members:

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Abstract:

In today's interconnected world, systems integrate with other systems into a system-of-systems (SoS) context; a network of interrelated systems that can often exhibit both expected and emergent behavior. The current state-of-the-art validation process of these system-of-systems and their community of practitioners in the academic community within industry is limited to static methods focused on individual system and defining who is doing what and where. Current research on executable architectures introduced temporal aspects regarding when actions are conducted within or by the system. However, the conducted research presented in this thesis shows that this is not sufficient. To answer the questions of “why” and “how” a system operates within complex systems-of-systems interrelationships a system's architecture and context must be observed over time.

The objective of this research is to determine a method for validating a system's executable architecture and assess the contribution and efficiency of the specified system before it is built. The evaluated theory provides concrete steps that synthesize the observance of the executable architecture within its executable context derived from the operational System of Systems domain using mixed (qualitative and quantitative) research methods. The resulting methods combines established methods of the operational community and the modeling community – such as the Military Missions to Mean Framework (MMF) and the DEVS Unified Process (DUNIP) – and an innovative and unique way. It is shown that incorporating the context affects the validation of the system and enables observations that are unique to the developed method. Therefore, the thesis shows the necessity to apply the knowledge-based approach for validation of system-of-systems architectures.

Resume

Mr. Johnny Garcia received his Bachelors of Art (1998) and his Bachelor of Science (1999), both from St Leo College, St. Leo, Florida. He received his Masters of Science in Information Systems (2001) and Masters of Business Administration (2003) from the Florida Institute of Technology, Melbourne, Florida. He is a veteran of the US Navy, Enlisted 2nd Class Petty Officer (1989-1995). He worked for General Dynamics as Engineer/Chief Technologist/CTO (1995-2007). Since 2007, he is CEO and Founder of the local M&S Company SimIS Inc.