

## Unified Architecture Framework (UAF) Summit – Wednesday, March 22, 2023

*Note: All times are listed in Eastern Time (EDT)*

**9:00 – 9:30am | Welcome Address**

*Co-Chair: [Aurelijus Morkevicius, Industry Process Consulting Director \(Dassault Systèmes\)](#)*

*Co-Chair: [Laura Hart, Research Engineer Senior Manager \(Lockheed Martin\)](#)*

**Abstract:** This session will provide an introduction to the event and to the Unified Architecture Framework (UAF), its purpose, adoption, and roadmap (highlighting what's new in the upcoming UAF v2).

**Bio:** Aurelijus has 17 years of experience in systems and software engineering. His areas of expertise are model-based systems, software engineering, and defense architectures (DoDAF, NAF, and UAF). Aurelijus works with the Aerospace Corporation, Airbus, BAE Systems, Boeing, MITRE, and others. Aurelijus is INCOSE ASEP and OMG certified (BPM, SysML, and UML 2) and is also the lead architect of the current OMG UAF standard, the main author of the MagicGrid framework, and the Dassault Systèmes representative in INCOSE and the NATO Architecture Capability Team. Aurelijus received his PhD in Information Systems Engineering from Kaunas University of Technology in 2013 and is a Professor there. He is also an article and book author and a speaker.

**Bio:** Laura is a Senior Manager for Corporate Engineering, Engineering Research at Lockheed Martin enabling Digital Transformation. Laura has over 30 years of industry experience covering a wide spectrum of responsibilities applying Model-Based Systems Engineering across the development lifecycle of complex software and hardware systems. Laura's current focus is leading the Model-based Acquisition (MBAcq) User Group for the standardization of Model-based acquisition across industry. Laura is co-chair of OMG Unified Architecture Framework (UAF) specification team, Adjunct professor Drexel University and NDIA System Engineering Division Vice-Chair.

**9:30 – 10:00am | Keynote: Application of UAF in Support Mission Engineering of Early Stage Concept Development**

*[Bill Jankowski, Model Based Mission Engineering Lead \(Naval Sea Systems Command/Naval Undersea Warfare Center, Newport\)](#)*

**Abstract:** This presentation will address lessons learned from the use of UAF to track operational requirements and early solution constraints in support of early-stage JCIDS processes from the completion of Capabilities Based Assessment (CBA) through the Analysis of Alternatives. One approach for iterative integration of results from heterogeneous operations analysis modeling techniques with engineering models will also be discussed.

**Bio:** Bill is currently the Model Based Mission Engineering lead for Code 60 Mission Engineering and Analysis Branch. He was previously a principal investigator for Science and Technology for Communication, Imaging, and Electronic Warfare at the Naval Undersea Warfare Center, Newport, RI. Bill is a PhD Student in Systems engineering at the Naval Postgraduate School, and holds a MS in Systems Engineering from NPS, an MBA from the University of Texas at Tyler, a BS in Engineering Science from Trinity University in San Antonio, and a Joint Professional Military Education certificate from the Navy War College. He began his military career as a submarine officer, was recalled to active

duty as the CTF 50 Submarine Assistance team for Operation Iraqi Freedom, and retired from the Navy Reserve.

10:00 – 10:30 am | MORNING BREAK

10:30–11:00am | Applying UAF and The Airbus MBSE Framework within Future Combat Air System Development

[Dominique Ernadote, MBSE Senior Expert \(Airbus\)](#)

[Jörg Wirtz, Senior Manager Process, Methods & Tools FCAS \(Airbus\)](#)

[Lalitha Abhaya, Systems Architect \(Airbus\)](#)

**Abstract:** This session will address the combined usage of two architecture frameworks within the Future Combat Air System (FCAS) program. After a short introduction of the program and of the needs on MBSE modelling, the rationale for this combined approach will be elaborated by comparison of these needs with the objectives and capabilities of the two selected frameworks: the UAF and the Airbus MBSE framework. The challenges and solution approaches of this combined approach will be discussed and finally as an outlook a roadmap of framework convergence and the need for an MBSE framework interoperability standard presented.

**Bio:** Dr. Ernadote earned his PhD in Computer Science and spent his next 13 years managing the development of a modeling tool for the MEGA company, specifically dedicated to architecture frameworks such as UAF; NAF, DoDAF, and TOGAF. He currently works for Airbus as its MBSE (model-based systems engineering) Senior Expert and supports modeling projects across Airbus divisions. In 2020, he earned his Habilitation to Conduct Research (the highest French diploma certifying the highest scientific level of the candidate) from the University of Paris-Saclay in MBSE.

**Bio:** Jörg studied mechanical engineering with a focus on aeronautics at TH Darmstadt and acquired his Ph.D. at the Technische Universität München on the theme of 'A reference model for integrative definition of PDM' in 2001. He then joined Airbus (EADS) and held several management positions in the fields of engineering process, methods and tools, configuration management and information management within the divisions of Defense & Space and Helicopters. Since 2020, he has been responsible for the digital common working environment (CWE) of the FCAS at Airbus.

**Bio:** Lalitha is a Model-Based Systems Engineering expert and the technical leader of MBSE support team for FCAS at Airbus Defense and Space. She developed the UAF Based MBSE Methodology to be used to define the System of Systems Architecture. She is a MBSE trainer and has been in charge of MBSE training development within Airbus group. She is INCOSE ESEP certified and a key author of the ISO/IEC/IEE 24641 standard on MBSE. For several years now, she has been co-lead of the AFIS MBSE working group as well as the projects related to the Meta-Models and methodologies within AFIS.

11:00 – 11:30am | Using the Unified Architecture Framework in Support of Mission Engineering Activities

[James Martin, Distinguished Engineer \(The Aerospace Corporation\)](#)

**Abstract:** Mission Engineering is the deliberate planning, analyzing, organizing, and integrating of current and emerging operational and system capabilities to achieve desired warfighting mission effects. A Mission Engineering process was developed to capture the approach defined in the

DOD's Mission Engineering Guide. The purpose of this is to help train new mission engineers and merge this with standard approaches for capturing mission architectures. The Unified Architecture Framework (UAF) provides a framework of standardized views from which to model different aspects of an architecture, including the various concepts and properties of the mission being engineered. The Mission Engineering steps are tied to the workflow steps in the Enterprise Architecture Guide for UAF to help inform mission engineers of which UAF views can be used during the Mission Engineering effort. This session will address mapping between the UAF workflow and steps in the Mission Engineering Guide and how to use UAF when doing Mission Engineering activities.

**Bio:** James is the INCOSE representative to OMG's UAF Revision Task Force and was lead editor for the ISO 42020 standard on Architecture Processes. He is an Enterprise Architect and a Principal Systems Engineer at The Aerospace Corporation developing solutions for information systems and space system enterprises. He was a key author on the BKCASE project in development of Enterprise Systems Engineering articles for the SE Body of Knowledge (SEBOK). He led the working group responsible for developing ANSI/EIA 632, a US national standard that defined the processes for engineering a system. He previously worked for Raytheon Systems Company and AT&T Bell Labs on airborne and underwater systems and on communication systems. His book, Systems Engineering Guidebook, was published by CRC Press in 1996. He is an INCOSE Fellow and was leader of the Standards Technical Committee. He was the founder and was until recently leader of the Systems Science Working Group. He received the Founders Award from INCOSE for his long and distinguished achievements in the field.

11:30am – Noon | Keeping People First in the Smart Cities Enterprise

[Jennifer Russell, Program & Management Support Leader \(Garver\)](#)

[Matthew Hause, Principal Consultant \(System Strategy, Inc.\)](#)

[Lars-Olof Kihlström, Principal Consultant \(Syntell AB\)](#)

**Abstract:** In his Gettysburg Address, Abraham Lincoln spoke of "government of the people, by the people and for the people." The INCOSE Smart Cities Initiative (SCI) is proceeding along these lines to support municipal governments in considering people first in smart city efforts. This Initiative will support municipalities and public agencies in adopting Smart Cities technologies by applying systems engineering principles and tools. This Initiative will support holistic development of Smart Cities infrastructure and Concepts, Applications, Technology and Services (CATS) through an open framework. Their initial set of models and metrics focused on the people and communities to determine how a smart city can improve life for its residents. Towards that end, a modeling initiative using the Unified Architecture Framework (UAF) to put the human at the center of the system. The model looks at a city as an enterprise to examine the organizations, people, and communities using the human factors set of views. As a city of any size is a complex system of systems, the initial model is focused on Unhoused/Homeless People, how they interact with other organizations and people in the community, and how to improve outcomes for both them and the city. This session will briefly address the SCI and its goals, and then show how MBSE can help planners understand the problem before looking for solutions.

**Bio:** Through nearly three decades in the industry, Jennifer learned that the biggest factor in the success of any project is clear communication and ownership of roles and responsibilities. She's built her career around implementing systemic approaches to cross-discipline coordination to make

projects seamless and successful, whether that's utilizing an Owner's Advisor, or another delivery method. As Garver's Program and Management Support Leader, she prioritizes project coordination, design, and delivery by establishing processes and controls to keep projects moving forward.

**Bio:** Matthew is a Principal Engineer at SSI, a chair of the UAF group, and a member of the OMG SysML specification team. He was a member of the OMG Architecture Board for 10 years. He has been developing multi-national complex systems for over 40 years as a systems and software engineer. He started out working in the power systems industry and transitioned to command and control systems, process control, communications, SCADA, distributed control, military systems, and many other areas of technical and real-time systems. His role at SSI includes consulting, mentoring, standards development, presentations at conferences, as well as developing and presenting training courses.

Noon – 1:30 pm | LUNCH BREAK

1:30 – 2:15pm | Aligning to Industry Best Practices; UAF @ OSD

[Daniel Hettema, Director of Digital Engineering, Modeling and Simulation \(Office of the Under Secretary of Defense for Research & Engineering\)](#)

**Abstract:** For over two decades the Department of Defense Architecture Framework (DoDAF) has served as the bedrock on which architects have conveyed complex architectures to decision makers. Now with advisories accelerating, we must modernize our practice to communicate exponentially more complex architectures while simultaneously reducing the decision-making timeline. Industry has risen to meet this need with the development of the Unified Architecture Framework (UAF). A whole encompassing framework that combines the best parts of industry, NATO, and DoD architecture frameworks into a digital structured model. This session will address the importance of UAF in the digital transition, the role it serves within the Office of the Secretary of Defense (OSD), and roadmap for updates to policy and guidance.

**Bio:** Daniel oversees DoD-wide strategy, policy, and coordination in DEM&S and promotes the advancement of digital practices in defense acquisition. He joined the Federal Government supporting the Systems Engineering Directorate of the National Reconnaissance Office (NRO), where he championed digital engineering as a time saving, data-centric approach to development. He led teams focusing on data management, configuration management, and training as well as adopted Product Line Management approaches for engineering data, developed model-based systems engineering (MBSE) methodologies, and established an MBSE Community of Practice. Daniel has also served in the private sector supporting the government, applying systems engineering and advancing the state of digital engineering. In support of the Joint Staff, he developed models to enable two-step dependency analysis for mission assurance, developed an innovative approach to perform policy consistency checking, and applied natural language processing for DoD-wide organizational alignment. For the National Nuclear Security Administration, he coordinated systems engineering efforts across labs and developed a stockpile sustainment model to rapidly assess alternative sustainment approaches. For the Intelligence Community, he led teams developing MBSE products including ontologies, meta models, modeling patterns, data exchanges, and training material. Daniel is active in the International Council on Systems Engineering (INCOSE) and has served as Communications Chair for the Washington Metro Area chapter. At the international level, he served as NRO's representative on INCOSE's Corporate Advisory Board. He has presented at numerous

INCOSE and other systems engineering events. Daniel holds a B.S. in Systems Engineering from George Mason University and an M.S. in Space Systems from Johns Hopkins University. He is a certified Systems Model Builder Advanced from Object Management Group (Level 4) and an INCOSE Certified Systems Engineering Professional.

**2:15 – 2:45pm | OMG UAF Model Based Acquisition (MBAcq) Overview and Update**

[Laura Hart, Research Engineer Senior Manager \(Lockheed Martin\)](#)

**Abstract:** Systems Engineering has become Model-Based Systems Engineering (MBSE) in which models are used at all phases of development. To complete the digital thread from concept to disposal, models will be required for the acquisition phase. This session will describe the activities of the OMG MBAcq User Group, which is a broad industry body with participation from OMG, INCOSE, Armed Services, OUSD, DoD CIO, NDIA, DAU, FFRDCs and many industry suppliers such as Boeing, Northrup Grumman, Lockheed Martin, etc. working together to create the standards and guidance to successfully deploy MBAcq to the larger community.

**Bio:** Laura is a Senior Manager for Corporate Engineering, Engineering Research at Lockheed Martin enabling Digital Transformation. Laura has over 30 years of industry experience covering a wide spectrum of responsibilities applying Model-Based Systems Engineering across the development lifecycle of complex software and hardware systems. Laura's current focus is leading the Model-based Acquisition (MBAcq) User Group for the standardization of Model-based acquisition across industry. Laura is co-chair of OMG Unified Architecture Framework (UAF) specification team, Adjunct professor Drexel University and NDIA System Engineering Division Vice-Chair.

**2:45 – 3:15pm | How I Stumbled Across A Domain Overlay and Why It's Actually Useful**

[Michael Shearin, Senior Research Engineer \(Georgia Tech Research Institute\)](#)

[Richard Wise, Senior Research Engineer \(Georgia Tech Research Institute\)](#)

**Abstract:** So you have to be MOSA compliant? What does that mean? A Modular Open Systems Approach (MOSA) according to Title 10 of the U.S. Code means that a compliant system will employ a modular design and that major systems interfaces be compliant with consensus-based standards. The better question then is, how do you get started? We have developed an approach in UAF that gives system developers a leg-up to MOSA compliance at least with respect to the identification and application of consensus-based standards. It was after we created this approach that we became aware of the Domain Overlay concept work being done by the Model-Based Acquisition Working Group, and in a great sense of irony, validated our approach. This is the story of that journey, and how we see this approach being useful to our MBSE community.

**Bio:** Mike is a Senior Research Engineer at GTRI and the associate head of the Model-Based Systems Engineering (MBSE) Research, Education and Applications branch in the Systems Engineering Research Division. He has developed Systems Modeling Language (SysML) models and MBSE tooling to support existing and new systems engineering methods and processes for Navy, Army, and Air Force sponsors. His current MBSE passions are in the architecting and implementation of Digital Engineering environments and ecosystems, and with using Legos to more effectively teach MBSE to masters students and professionals in a fun and meaningful way. In addition to his sponsored

research, Mike teaches in multiple Professional Masters of Applied Systems Engineering (PMASE) courses and professional short courses such as the Fundamentals of Modern Systems Engineering and Dr. Russel Peak's SysML 101/201 course. He enjoys life in Atlanta, GA with his beautiful bride Becca, his son the Amazing Sam, and his daughter, the Indomitable Cassie Ru.

**Bio:** Richard is a Senior Research Engineer at the Georgia Tech Research Institute where he leverages his passion and experience in Model-Based Systems Engineering to research, educate, and lead teams in the design and analysis of complex systems. He is the instructor for the Systems Modeling with SysML course in the Professional Masters in Applied Systems Engineering graduate degree program of Georgia Tech as well as co-instructor for several Georgia Tech Professional Education short courses. His research interests include: concept formulation and expression via metamodels and modeling languages, integration of descriptive and analytic system models, and modeling frameworks, patterns, and libraries.

3:15 – 3:45pm | AFTERNOON BREAK

3:45 – 4:15pm | **Lessons Learned While Applying Mission Engineering to The Military Acquisition Process Using The Unified Architecture Framework**

[Monte Porter, Consultant \(Monte Porter Associates LLC\)](#)

**Abstract:** This session will share some of the lessons learned in the organization wide roll-out of MBSE and specifically address some of the extensions to the standard that are necessary to support a product manager in the pursuit of a successful program. The session will also cover the application of Mission Engineering to support the process.

**Bio:** Monte is an MBSE Practitioner/SME working with UAF and SysML in support of the Army's materiel acquisition process. He has years of experience as a Capability Developer (the requirement side) and a Materiel Developer (the PM side). He has over 30 years of system engineering experience in C4I development, simulation, integration and testing to include the planning, design, implementation and management of Live Virtual and constructive simulation. For the past 12 years Monte has spearheaded the efforts of PEO Missiles and Space to move forward into the digital engineering domain. He is an advocate for UAFML and provides his wealth of experience to the efforts of (ASA(ALT)) and Army Futures Command. With his PEO MS team he developed and currently presents a quarterly 32-hour MBSE "Bootcamp" focusing on the application of MBSE and UAFML to the JCIDS process. Monte has a Master's Degree in Computer Systems, an Acquisition Corps MBA and is a Command and General Staff College Graduate.

4:15 – 5:00pm | Closing/Q&A/Discussion

Co-Chair: [Aurelijus Morkevicius, Industry Process Consulting Director \(Dassault Systèmes\)](#)

Co-Chair: [Laura Hart, Research Engineer Sr. Manager \(Lockheed Martin\)](#)