2025 Technical Conference

Presented by:

International Council on Systems Engineering (INCOSE)
San Diego and Los Angeles Chapters

Converging Frontiers: Engineering Resilience Across Domains. Tagline: From Battlefield to Biotech to Bytes - Advancing Systems Thinking for a Secure and Sustainable Future

Friday & Saturday, 5-6 December 2025

Dassault Systèmes
7473 Lusk Blvd, 3rd Floor San Diego, CA, 92121
&
San Diego State University (SDSU) Hepner Hall
Room 130, Floor 1, Campanile Mall, San Diego, CA 92182

Email: **info@sdincose.org**

Website: **https://sdincose.org**

Dear Attendees,

Welcome to our 2025 INCOSE Joint Technical Conference, where Systems Thinking and innovation meet collaboration. Over the next two days, you'll engage with thought leaders, explore cutting-edge research, and connect with peers across industries.

We want to give big shout out to our hosts, Dassault Systèmes and San Diego State University (SDSU), our sponsors, speakers, and volunteers for making this event possible.

Thank you so much!!

Sincerely,

John Thomas
President
INCOSE SD

Daniel Winton
President
INCOSE LA

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Schedule

Friday, 5 December 2025

Dassault Systèmes

7473 Lusk Blvd, 3rd Floor San Diego, CA, 92121

(Subject to Change)

PLEASE NOTE: Our Friday host requires the attendee list by Monday, Dec 1st. If you plan to attend Friday, please register as soon as possible. **Note that we will still attempt to add late registrants**, but admission cannot be guaranteed.

Time	Room 39	Room 90	Room 2 Conf Room
8AM	Setup		
8:30 AM	Check in / Breakfast / Networking time		
9 AM		**SysML V2 in Practice – A Hands-On Tutorial using CATIA Magic** (3-hour tutorial) Sean Densford	**SEP Paper Exam**
10 AM 11 AM	**AI-Augmented MBSE** (2-hour tutorial) Robert Karban		
12 PM	Lunch / Check in		
1 PM 2 PM 3 PM 4 PM	**AI Assisted MBSE (AIM)** (4-hour tutorial) Doug Rosenberg	**Requirements: A Comprehensive Overview** (4-hour tutorial) Dr. Rick Hefner	
5:30 PM	**Social at Crust-n-Brew** (4653 Carmel Mountain Rd, San Diego, CA 92130)		

Schedule

Saturday, 6 December 2025

San Diego State University (SDSU) – Hepner Hall

Room 130, Floor 1, Campanile Mall, San Diego, CA 92182

(Subject to Change)

	Room 130	Room 134	Room 150
07:30 AM	Setup and Check in		
0830 AM	**Welcome, Opening Remarks (Room 130)**		
0845 AM	**Keynote – Nick Freije (Room 130)**		
0930 AM	**Accelerate your SE Career Tutorial** (2hrs) – Dr. Rick Hefner	**Incremental Systems Approach for Healthcare** – Dr. Julia Taylor	**AI-Driven Predictive Analytics** – Bhoite Harshraj
1020 AM		Break/Networking Opportunity	
1030 AM		**Resilience Modeling for MBSE and Digital Engineering** – Ken Cureton	**Navigating the Blurry Line: Distinguishing True Requirements from Derived Constraints** – Dr. Sri Harsha Maramraju
1120 AM	Break/Networking Opportunity		
1130 AM	**SE Knowledge as Prerequisite for MBSE and Digital Engineering** – Dr. Rick Hefner	**Application of AI-Driven Process to Design in Transportation** – Dr. Jennifer Mariani, Walter Stamirowski	**Engineering Lawmaking: New Developments from INCOSE SELAW WG** – Greg Bulla, David Schrunk
1220 PM	Lunch		
1250 PM	**Lunchtime panel: Status Check: Where Are We Really on the Road to Full MBSE and Digital Transformation? (Room 130)** - Facilitator Stephen Guine. Panelists – Robert Weaver (NAVWAR), Glenn Eberhardt (G2-Ops), Suresh Narayanan (INCOSE SD)		
1:40 PM	Awards ceremony (San Diego ch Jeff Grady Award)		
1:50 PM	**Applying UAF and MBSE to Sustainability Architectures and Certifiable ADAS AI Systems** – Mark TenEyck	**Transforming Systems with Neuromorphic Computing** – Dr. Art Villanueva	**Ensuring Trustworthy AI for Systems Engineering Cost Estimation with Deterministic Tools** – Dr. Ray Madachy
2:40 PM	Break/Networking Opportunity		
2:50 PM	**CONOPS and OPSCON as Critical Requirements Drivers** – Dr. Rick Hefner	**Using Affordance-Based Design Principles for MBSE** – Stephen Guine, Mel Wachtel	**A Machine Learning Approach for Enhancing GNSS** – Persia Goudarzi, Dr. Reginald Bailey
3:40 PM	Break/Networking Opportunity		
3:50 PM	**Techniques for Managing Emergence in Complex Systems** – Dr. Rick Hefner	**Integrated Systems Modeling with SysML v2** – Robert Karban, Johannes Gross, Christopher Delp	**Natural Language Processing for Requirements Engineering** – Jeremy Jackson
4:50 PM	Closing Remarks/Photo (Room 130)		
5:30 PM	**Oggi's Mission Valley** (2245 Fenton Parkway Ste 101, San Diego, CA 92108)		

Keynote Speaker

Mr. Nick Freije

Mr. Nick Freije is a Senior Professional Engineer in the Agile Mission Systems division at General Atomics–Aeronautical Systems, Inc. (GA-ASI), where he supports innovation in Unmanned Aircraft Systems through mission architecture, system-of-systems engineering, and operational assessments that strengthen the performance and interoperability of GA-ASI's next-generation platforms.

Prior to joining GA-ASI, Mr. Freije spent three decades with the Department of the Navy, culminating in his role as Assistant Chief Engineer for Mission Architecture at NAVWAR. As a Senior Executive Service member, he led the Navy's digital engineering transformation, helping to shape enterprise-wide architecture and engineering policies for C4ISR, IT, and Space Systems. His leadership as Technical Director for Fleet Readiness and Chief Engineer for programs such as CANES, ANP, and ADNS helped modernize the Navy's operational networks and strengthen its information warfare capabilities. Mr. Freije holds an A.S. in Engineering from Broome Community College and B.S. and M.S. degrees in Electrical Engineering from the University of Buffalo.

Tutorials

★ Tutorial: SysML V2 in Practice – A Hands-On Tutorial using CATIA Magic (3 hours)

Presenter: **Sean Densford** (NoMagic, Inc. Dassault Systèmes)

Date-Time: Friday, Dec 5th, 2025, at 9am

Summary: As the excitement for SysML V2 grows, industry begins to discover its benefits and push its limits. One of the promises of V2 is the ability to use textual notation to manipulate the model. This brings additional capabilities beyond what was available in V1. However, it is a new language and there are not yet as many available learning resources as SysML V1. This tutorial seeks to bridge that gap by providing a comprehensive overview of the language, with labs demonstrating how the language can be implemented.

What Attendees Will Learn:

Attendees will learn about Structure, Behavior, Textual Notation, and some concepts of Views within the context of SysML V2. They will build a basic model of a conceptual architecture to get them ready to use the language.

★ Tutorial: AI-Augmented MBSE: Hands-On Tutorial with Conversational AI and SysMLv2 (2 hours)

Presenter: **Robert Karban** (Planetary Utilities)

Date-Time: Friday, Dec 5th, 2025, at 10am

Summary: This interactive tutorial introduces participants to the practical use of conversational AI to accelerate and simplify model-based systems engineering (MBSE). Attendees will gain hands-on experience creating, simulating, and refactoring engineering models (including SysML v2, thermal, orbital, 3D twins) using natural language interfaces—without needing deep expertise in modeling syntax or complex tools. Using the Starforge platform, participants will work directly with AI assistants integrated into MBSE workflows. Guided labs will include building SysMLv2 models, designing a multi-domain spacecraft, and performing orbital analysis with Sedaro Satellite through text-based interaction. Participants will also explore digital twins, run simulations, and perform impact and fault analysis with AI support. This session provides a unique opportunity to experience how AI-augmented MBSE can enhance productivity, reduce barriers to entry, and empower engineers to focus on solving real-world challenges.

What Attendees Will Learn:

Both knowledge and experience in creating, simulating and MBSE refactoring models using natural language interfaces.

★ Tutorial: Requirements: A Comprehensive Overview (4 hours)

Presenter: Dr. Rick Hefner (Caltech CTME)

Date-Time: Friday, Dec 5th, 2025, at 1 pm

Summary: Requirements are among the most critical—and often misunderstood—aspects of modern systems development. Without solid requirements, projects risk misalignment, rework, and failure to meet stakeholder needs. This tutorial presents a comprehensive, structured approach to modern requirements development, encompassing best practices across the full lifecycle: elicitation, analysis, validation, specification, allocation, and verification. An introduction to model-based techniques for requirements development is also featured, enabling enhanced clarity and traceability across complex systems. The methods presented are broadly applicable to industries with complex, regulated development environments—such as aerospace, defense, healthcare, energy, automotive, and telecommunications. Each domain demands clear stakeholder alignment, stringent compliance, and robust design integrity.

Topical outline:

1. Requirements Elicitation & Analysis – Techniques for defining stakeholder needs; use of context definition, mission analysis, and ConOps to frame the problem space.

2. Validation – Ensuring alignment of requirements with stakeholder intent, and resolving ambiguities early to prevent costly downstream problems.

3. Specification & Allocation – Translating abstract needs into clear, actionable, and measurable statements; decomposing requirements and systematically allocating them to system components.

4. Verification – Linking requirements to objective evidence—inspections, analysis, tests, or demonstrations—to confirm that outputs meet needs.

5. Introduction to Model-Based Techniques – Leveraging modeling tools (SysML, traceability diagrams) to manage complex requirement relationships and integrate seamlessly into MBSE environments.

These structured steps foster consistency, reduce misinterpretation, and support rigorous system engineering workflows.

What Attendees Will Learn:

Attendees will leave the session with actionable insights and practical tools to:

- Structure a comprehensive requirements development process covering elicitation through verification.
- Tailor practices to industry-specific constraints and regulatory regimes, ensuring applicability in highly regulated and agile sectors.
- Improve stakeholder alignment using context framing and mission analysis techniques.
- Enhance clarity and testability of requirements through refined specification and allocation methods.
- Implement traceability and verification strategies that support lifecycle governance and program assurance.
- Leverage model-based requirements techniques to visualize dependencies, manage complexity, and integrate with MBSE workflows.

★ Tutorial: AI-Assisted Model-Based Systems Engineering (AIM) (4 hours)

Presenters: **Doug Rosenberg** (Parallel Agile, Inc., Caltech CTME)

Date-Time: Friday, Dec 5th, 2025, at 1pm

Summary: Generative AI is rapidly changing the way engineers build and evaluate models. By automating routine modeling tasks and assisting in requirements, architecture, and analysis, AI enables systems engineers to focus on higher-value decision-making. The AI-Assisted MBSE (AIM) methodology integrates generative AI (e.g., ChatGPT, CoPilot) into MBSE workflows, improving speed, consistency, and model quality.

Attendees will explore AIM through a series of hands-on experiences and case-based modules, including:

- Introduction to AIM – Understanding how generative AI enhances MBSE productivity and fidelity.
- SysML with AI Enhancement – Modeling structure, behavior, and requirements using SysML, augmented with generative AI to expedite model creation and refinement.
- Hardware/Software Co-Design – Embedding software within system models and leveraging AI for cross-domain integration.
- AI Enhanced Requirements Engineering – Structuring and synthesizing requirements with AI assistance to identify gaps and ambiguities.
- Use Case and UI Generation – Employing AI to create use-case narratives and preliminary interface wireframes.
- AI Supported Architecture Design – Constructing scalable logical and physical architectures informed by domain models and AI-driven trade analyses.
- Behavioral Modeling and Code Generation – Defining state machines and utilizing AI to auto-generate diagrams and embedded code.
- Parametric Analysis & Optimization – Applying AI in system simulations, constraint evaluation, and performance trade-offs.
- AI Assisted Testing and Validation – Generating unit, behavioral, and integration test cases using AI to validate model fidelity.
- Looking Ahead: SysML v2 – Preparing engineering teams for next-generation modeling language capabilities through AI ready workflows.

What Attendees Will Learn:

Participants will leave equipped to:

- Integrate generative AI into MBSE workflows to accelerate model development, documentation, and analysis.
- Apply AIM techniques across the full systems engineering lifecycle, from requirements to testing and software integration.
- Facilitate software/hardware co design, AI driven architecture optimization, and enhanced requirement traceability.
- Implement AI enabled test generation, simulation, and behavioral modeling for more robust validation.
- Strategize for future-proofing engineering practices by aligning with emerging standards such as SysML v2.

★ Tutorial: Accelerate Your Systems Engineering Career: Mastering Essential Interpersonal Competencies (2 hours)

Presenter: **Dr. Rick Hefner** (Caltech CTME)

Date-Time: Saturday, Dec 6th, 2025, at 9:30am (Note – this time is subject to change.)

Summary: To advance in your systems engineering career, technical competence isn't enough—you must master your interpersonal skills. This tutorial provides a practical guide for systems engineers looking to significantly enhance their professional competencies, aligned directly with the INCOSE Systems Engineering Competency Framework. Participants will leave equipped with the knowledge, tools, and mindset necessary to enhance their systems engineering interpersonal capabilities. Whether embarking on a new career path or seeking to advance in their current role, participants will emerge from the tutorial empowered to tackle the most challenging systems engineering problems with confidence and competence.

Competencies covered:

- **Communications**: Effectively conveying complex technical information to diverse audiences and ensuring clarity and understanding.
- **Ethics and Professionalism**: Applying sound judgment and professional responsibility in decision-making and adhering to ethical standards.
- **Technical Leadership**: Guiding teams, influencing technical direction, and driving consensus on critical system design choices.
- **Negotiation**: Securing necessary resources, managing stakeholder expectations, and resolving conflicts with suppliers and partners.
- **Team Dynamics**: Fostering high-performing teams, understanding team roles, and maximizing collaboration across disciplines.
- **Facilitation**: Leading effective meetings, workshops, and review sessions to drive structured progress and consensus.
- **Emotional Intelligence**: Understanding and managing your own emotions and accurately perceiving and influencing the emotions of others for better project outcomes.
- **Coaching and Mentoring**: Developing and enabling the growth of junior engineers and sharing institutional knowledge.

What Attendees Will Learn:

The knowledge, tools, and mindset necessary to enhance their systems engineering interpersonal capabilities. Whether embarking on a new career path or seeking to advance in their current role, participants will emerge from the tutorial empowered to tackle the most challenging systems engineering problems with confidence and competence.

Presentations

★ A Machine Learning Approach for Enhancing Resilience and Reliability of GNSS in Challenging Environments

Presenters: **Persia Goudarzi** (George Washington University) and **Reginald Bailey** (George Washington University)

Summary: Global Navigation Satellite Systems (GNSS) play an essential role in many modern systems and infrastructures by providing reliable positioning, navigation and time information. They support mission critical functions across a wide range of civil and military applications including navigation, intelligent transportation systems, logistics, electric power grids, communication systems, agriculture and financial systems. However, GNSS vulnerabilities to unintentional degradations and intentional threats can significantly impact its robustness and reliability, disrupting performance of systems that rely on GNSS for position, navigation and time (PNT). Intentional threats include two main categories of interference signals: jamming and spoofing. Jamming or blanket interference refers to intentional use of high-power signals to suppress RF signals from navigation satellites in GNSS receivers and affect the performance of the system. Spoofing interference is when a malicious actor sends a GNSS receiver a fake signal that is similar in structure and characteristics to authentic satellite signals with the purpose of deceiving the system by giving it false information regarding position, navigation and time. Jamming interference is easier to generate and thus is a more common form of threat. Generating spoofing interference, however, is more complex and requires more sophisticated equipment and is usually harder to detect. Therefore, while spoofing is less common than jamming, it is considered a more dangerous threat because of the high cost and complexity of detecting it. Countermeasures that are currently used for detecting spoofing attacks are either very complex, costly or not very effective. These methods and technologies often are specific to predefined scenarios and environments. This paper proposes a data-driven, machine learning-based framework for detecting and classifying spoofing attacks. The classifier consists of three main components: a pre-processing unsupervised model for dimensionality reduction, a deep learning model for detection, and a post-processing unsupervised model for further clustering and refinement. It is expected that this end-to-end, data-driven model will improve detection accuracy and effectiveness in challenging environments where signal characteristics and noise profile cannot easily be predicted by predefined mathematical models. The proposed ML-based framework will learn hidden patterns and relationships in the data to increase probability of detection at a lower cost compared to existing solutions.

★ AI-Driven Predictive Analytics for Enhancing Systems Engineering Decision-Making

Presenter: **Harshraj Bhoite** (LTIMindtree)

Summary: Modern systems are increasingly complex and operate under high levels of uncertainty. Traditional systems engineering (SE) methods for requirements management, verification, validation, and risk assessment often rely on static assumptions and post-hoc evaluations, making them insufficient for today's dynamic environments. This paper explores how Artificial Intelligence (AI)-driven predictive analytics can strengthen SE decision-making by providing earlier, data driven insights into system behavior, risks, and performance outcomes. We propose a comprehensive framework that integrates predictive analytics techniques with SE processes and illustrate its application through case studies in aerospace and infrastructure projects. Results demonstrate improvements in requirement traceability, proactive risk mitigation, and overall system resilience. We also discuss challenges of data quality, interpretability, and

ethical adoption, concluding with directions for future research and practice in AI-enabled systems engineering.

★ Application of AI-Driven Process to Systems Design and Integration in Transportation Projects

Presenters: **Dr. Jennifer Mariani** and **Walter Stamirowski** (CharisTech Engineers and Consultants)

Summary: We present a novel approach for project delivery of systems during the design, integration and commissioning in transportation and transit projects. The approach leverages an AI-driven language analysis software tool coupled with requirements management tool with human oversight by systems experts, to perform contract and document analyses and management. The process is beneficial in uncovering conflicting requirements, scope gaps, and traceability of requirements across multiple documents. The application of this process to current projects in transit is presented showing how this approach can keep the project on time and on schedule. The application to Transit Asset Management is discussed. However, this approach can also be used in other disciplines where there are systems being integrated and coordination of different agencies and authorities is needed.

★ Concept of Operations and Operational Concept as Critical Requirements Drivers

Presenter: **Dr. Rick Hefner** (Caltech CTME)

Summary: The foundational phase of systems engineering is defining the what and why of a system. The Concept of Operations (ConOps) and the Operational Concept (OpsCon) are frequently treated as perfunctory documentation or completely ignored. This presentation will show how the ConOps and OpsCon are an indispensable bridge from vague stakeholder needs to clear, verifiable system requirements. Furthermore, we will illustrate how modern Model-Based Systems Engineering (MBSE) and the precise semantics of SysML v2 offer unprecedented opportunities to capture these concepts as executable, analytical models, elevating them from static documents to living digital assets. Industry references vary widely in their definition of these two artifacts. For our purposes, we define the ConOps as a description of how the system-of-interest interacts within its broader context. This is frequently referred to as the stakeholder view of "what" the system is supposed to do. The OpsCon is a detailed description of how the system's capabilities are organized to execute specific operational scenarios or use cases. It details the "how"—the interactions, system states, modes, and functions that realize the high-level concept. The OpsCon directly informs the functional and performance requirements. The key to developing a complete and correct set of stakeholder requirements (and by extension, system requirements) is to capture the ConOps and OpsCon in artifacts that can be presented to the stakeholders, so that mistaken and missing functions can be identified. In this presentation, we demonstrate:

- How a ConOps, in the form of a context diagram, can be used to identify all system-of-interest interfaces
- How an OpsCon, in the form of sequence diagrams, can be used to define nominal and off-nominal scenarios
- How the consistency and completeness of the ConOps and OpsCon can be evaluated, and
- How the OpsCon drives system functional requirements.

The traditional document-centric approach has limited the utility of ConOps and OpsCon. MBSE provides the pathway to digitize and make these artifacts actionable. Actions, Activities, and Flows in the SysML v2 kernel, coupled with explicit Usage and Verification constructs, allow ConOps and OpsCon scenarios to be

used as executable models. By linking model elements (e.g., Operational Activities or Use Cases) to specific textual requirements using the new robust requirements capabilities in SysML v2, the model guarantees continuous, verifiable traceability.

★ Engineering Lawmaking: New Developments from INCOSE's SELAW WG

Presenters: **David G. Schrunk, MD** and **Greg Bulla** (INCOSE SELAW WG)

Summary: The INCOSE Systems Engineering and Lawmaking Working Group (SELAW) was established in 2022 to help governments address complex societal challenges through a structured, systems engineering–based approach to lawmaking. While many laws achieve their intended outcomes, the legislative process itself often lacks consistency, often resulting in ineffective, duplicative, or outdated laws that waste resources and erode the public trust. This initiative aligns with INCOSE's Systems Engineering Vision 2035, which calls for expanding the application of systems engineering beyond purely technical domains. This presentation will begin by introducing SELAW's mission and vision for applying systems engineering to the lawmaking process. It will then highlight progress on several ongoing initiatives, including the development of a draft Law Design Manual based on systems engineering principles, a risk prediction model for proposed legislation, and emerging international collaborations advancing the application of systems engineering to governance in Europe, Japan, and Mongolia.

★ Ensuring Trustworthy AI for Systems Engineering Cost Estimation with Deterministic Tools

Presenter: **Dr. Ray Madachy** (Naval Post-Graduate School (NPS))

Summary: Large language models (LLMs) can demonstrate remarkable fluency and contextual understanding, yet frequently produce incorrect or hallucinated results when performing mathematical or domain-specific calculations. Systems engineering cost estimation, by contrast, demands transparency, repeatability, and traceable results. To overcome this limitation, this research evaluates methods for enforcing deterministic, verifiable computation in LLM-driven workflows by delegating all calculations to an external, trusted API. Using OpenAI's Custom GPT Actions and other web-based tools, language models are bound to a remote endpoint implementing the Constructive Systems Engineering Cost Model (COSYSMO) cost estimation model. The models are explicitly restricted from internal calculation and are instead required to invoke the external tool via a formally defined endpoint, guaranteeing computational correctness, removing ambiguity in tool usage, and ensuring transparent traceability of results. A smart input capability is included to automatically infer and validate required cost model parameters from natural-language project descriptions and other media, further streamlining the estimation process. This approach demonstrates integrating generative AI with quantitative engineering models to establish trustworthy AI for cost modeling and systems engineering decision support.

★ From Fragmented Development to Outcome Assurance: Applying UAF and MBSE to Sustainability Architectures and Certifiable ADAS AI Systems

Presenter: **Mark TenEyck** (CATIA Brand/Dassault Systèmes)

Summary: As systems become more autonomous, software-defined, and sustainability-regulated, organizations must ensure that outcomes are trustworthy, explainable, and aligned with enterprise goals. This presentation highlights two model-based assurance patterns that accelerate this transformation. Using UAF, sustainability becomes an architectural problem rather than a reporting obligation—Creating a proactive

system linking strategy to capabilities, investments, and measurable impacts. This enables organizations to anticipate risk, evaluate trade-offs, and govern sustainability outcomes proactively as well as cutting the reporting time in half. A second case study demonstrates how a global automotive OEM transitioned from siloed ADAS development to a fully assured, certifiable AI process. Through a robust metamodel, automated validation suites, explainability tooling, CI/CD pipelines, and traceable ISO 26262 artifacts, the project established a repeatable enterprise pattern for safe and transparent AI-driven mobility systems. Across both examples, assurance engineering emerges as a unifying discipline—providing the structure, evidence, and predictability required to scale complex system development in an era of AI and sustainability regulation.

★ Incremental Systems Approach Medical Model for Better Healthcare Outcomes

Presenter: **Dr. Julia Taylor** (Taylor Success Systems)

Summary: The medical system is very fragmented, services are not integrated, and the system does not adequately address complex illnesses such as chronic diseases and ailments that fall outside the norms-- the zebras. One approach that could at least bring incremental improvement to the system is a patient centric approach. This approach considers the human body as a whole system with key health decisions being made by the patient and diagnosis and treatment being driven by the patient. This presentation/paper discusses the legislative, regulatory, financial, and social changes required to implement this model. It highlights the benefits of the model and mentions future possibilities for a higher level systems approach for the healthcare system.

★ Integrated Systems Modeling with SysML V2

Presenters: **Robert Karban** (Planetary Utilities, Caltech CTME), **Johannes Gross** (Planetary Utilities), and **Chris Delp** (Caltech/JPL)

Summary: Modern space systems face unprecedented complexity. Serviceable, modular spacecraft architectures promise long-lived, reconfigurable missions, but current engineering methods remain fragmented. The traditional approach relies on discipline-specific tools—geometry, thermal, power, orbital dynamics—each producing artifacts in proprietary formats. These silos create discontinuities across the product lifecycle, hindering tradespace exploration and complicating system integration. The purpose of this work is to demonstrate an open engineering platform that integrates these domains under a SysML v2 backbone. Engineers work in the application domain through rule-based design languages, while consistent, traceable models are generated behind the scenes. This approach builds on the Dragon architecture—a pipeline of digital twins that organizes engineering artifacts with global traceability and lifecycle continuity. Our implementation, called Starforge, extends Dragon with an AI-first interface, SysML v2 integration, and domain-specific design languages such as Starkit for modular spacecraft.

★ Natural Language Processing for Requirements Engineering

Presenter: **Jeremy Jackson** (Northrop-Grumman Corporation)

Summary: This presentation provides an introduction for applying large language models (LLMs) to one of systems engineering's most persistent tasks: generating verification methods for requirements in alignment with INCOSE standards. It discusses the current research in Natural language Processing for Requirements Engineering (NLP4RE), demonstrates how to create datasets needed to train and evaluate an AI model, and uses Stanford's DSPy library to extend the basic GPT model to explore different AI models that write and

evaluate verification methods without requiring deep machine learning expertise. This presentation teaches systems engineers how to decompose verification into syntactic and contextual components that an LLM can process, how to design prompts that reflect domain-specific reasoning, and how to evaluate model outputs when multiple “correct” answers may exist. Through this process, practitioners can learn how to treat LLMs as analytical tools within the broader systems engineering toolkit — capable of accelerating requirements verification, enabling reproducible experimentation, and supporting future crowd-sourced validation efforts.

★ Navigating the Blurry Line: Distinguishing True Requirements from Derived Constraints and Design Decisions

Presenter: **Dr. Sri Harsha Maramraju** (Dexcom)

Summary: A foundational tenet of Systems Engineering is the rigorous separation of the problem space ("what") from the solution space ("how"). Yet, in practice, the line between a Design Input and a Design Output is often deceptively complex and blurred. While we train Systems engineers to reject premature solutions masquerading as requirements, we often fail to equip them to handle the challenging gray areas: derived requirements and external constraints. A performance target for a software algorithm, for example, is the output of a system-level analysis, but it becomes a non-negotiable input to the software team. Similarly, a requirement to use a specific communication protocol may not be an arbitrary design choice, but a hard constraint imposed by an unchangeable external ecosystem. This presentation moves beyond the simple "what vs. how" mantra to provide a framework for navigating this blurry middle ground. We will dissect the anatomy of these complex requirements, showing how to distinguish between a legitimate derived performance constraint, an immutable external interface, and a genuinely premature design decision. Misinterpreting these leads to the classic failure modes: V&V teams validating the wrong things, stifled innovation as design space is needlessly constrained, and broken traceability chains that fail under the scrutiny of an audit or impact analysis. Ultimately, this talk will provide attendees with the disciplined analytical framework needed to govern this critical boundary, empowering them to defend the integrity of the problem space while masterfully accommodating the technical realities of complex projects.

★ Resilience Modeling for MBSE and Digital Engineering

Presenter: **Kenneth Cureton** (USC)

Summary: Successful systems for today's world and into the future must be resilient to a wide range of adverse conditions-- including both environmental and man-made adversities, whether expected or not. And of course, critical quality attributes such as safety, security, and reliability must also be maintained at ever-increasing levels throughout the life cycle of today’s and tomorrow’s engineered systems. This presentation leverages the products and findings of the INCOSE Resilient Systems Working Group to examine the necessary characteristics to model system resilience, with a special emphasis on potential resilience modeling techniques for Model-Based Systems Engineering (MBSE), Digital Engineering (DE), and Digital Twins via the proven science of System Dynamics. The presentation also examines the potential application towards organizational resilience. Understanding this presentation, the audience will be able to grasp and apply key concepts in resilience engineering and System Dynamics and understand where to access INCOSE resources and recommended references for potentially accomplishing resilience engineering in their current and future projects.

★ Systems Engineering Knowledge as a Prerequisite for MBSE and Digital Engineering

Presenter: **Dr. Rick Hefner** (Caltech CTME)

Summary: As organizations implement model-based systems engineering (MBSE) and other digital methods, many practitioners encounter challenges not with the tools, but with insufficient understanding of core SE principles. Drawing on decades of experience, this paper illustrates how structured SE training serves as an essential precursor to effective MBSE tool use. The paper explores the cognitive divergence of traditional SE thinking and the convergence required by MBSE tools, arguing that professional readiness depends on bridging this gap through pedagogy, practice and progression.

★ Techniques for Managing Emergent Properties in Complex Systems

Presenter: **Dr. Rick Hefner** (Caltech CTME)

Summary: Complex system design is fundamentally challenged by emergent properties — behaviors or attributes of the entire system that are not observable or predictable from examining any individual component alone. For instance, a system's reliability or security does not reside in a single circuit board or line of code; it emerges from the way all components interact within their defined environment. These emergent properties can be positive (e.g., higher than expected system efficiency) or, critically, negative (e.g., catastrophic failure due to cascading errors at interfaces). Successful systems engineering must shift focus from optimizing parts to architecting interactions, ensuring desirable emergence is realized and undesirable emergence is eliminated or mitigated. This presentation will detail a three-pronged strategy for proactively addressing emergence across the system lifecycle.

- Proactive Design and Requirements (Managing Desirable Emergence): The first step is to design for the desired outcome. This involves translating high-level goals into measurable, emergent characteristics.

- Design for Integration (Synthesis): Systems engineers must prioritize the design of interfaces over the design of individual components. This is formalized through Interface Control Documents (ICDs) that rigorously define timing, communication protocols, and physical connections. Intentional allocation of functions across subsystems is used to force the necessary interactions that realize the desired emergent property (e.g., mission effectiveness).

- Non-Functional Requirements (NFRs): Emergent properties, such as performance, safety, and security, are captured as NFRs. These must be made quantifiable (e.g., "The system shall have a Mean Time Between Failure (MTBF) greater than 5,000 hours") to allow for design verification and ensure that design trade-offs prioritize system-level value.

Model-Based Analysis and Simulation (Predicting Emergence): To minimize late-stage surprises, modern systems engineering relies on dynamic modeling and rigorous analysis prior to physical construction.

- Model-Based Systems Engineering (MBSE): Using formal languages like SysML, engineers create a digital representation of the system's structure and behavior. This allows for behavioral simulation to expose unexpected interaction sequences, resource conflicts, or deadlocks that signal negative emergence.
- Specialized Analysis Techniques: Techniques are employed to systematically search for hidden failure paths. Failure Modes and Effects Analysis (FMEA) identifies component failure causes and their resulting system-level effects.

Fault Tree Analysis (FTA) works in reverse, tracing system-level hazards (negative emergence) back to their root causes, often revealing interaction-based errors that no single component analysis would uncover.

Verification and Validation (Verifying and Discovering Emergence): Final assurance is achieved through rigorous testing at the highest level of integration.

- System-Level Testing: Emergent properties are confirmed only when the components are fully integrated. Testing strategies must focus on interface testing and system stress testing by pushing the boundaries of operational conditions to intentionally provoke negative emergent behavior (e.g., testing data overflow or timing latencies under peak load).
- Iterative Development and Prototyping: Utilizing agile or spiral models allows for the early discovery of both positive and negative emergent properties in prototypes. By finding and addressing these surprises early, the cost of redesign is dramatically reduced. This process transforms potential system surprises into manageable design constraints, ensuring the final product is robust, reliable, and delivers the intended system value.

★ Transforming Systems with Neuromorphic Computing

Presenter: **Dr. Art Villanueva** (Phronos and General Atomics)

Summary: As the complexity of modern systems grows, traditional computing architectures struggle to meet the demands of real-time adaptability, energy efficiency, and scalability. Neuromorphic computing, inspired by the brain's architecture and processes, offers a novel approach to designing intelligent, adaptive systems. Using spiking neural networks (SNNs) - a computational model that mimics biological neurons - neuromorphic systems enable energy-efficient, event-driven processing optimized for dynamic environments. This presentation explores the contrast between traditional and neuromorphic architectures, the capabilities of SNNs in real-time processing, and practical applications such as autonomous UAV navigation, swarm intelligence, and smart infrastructure. It also addresses the integration of neuromorphic technologies into existing workflows, along with challenges like scalability, interoperability, and performance trade-offs. By situating neuromorphic computing within the context of modern engineering challenges, this presentation provides valuable insights into the potential of brain-inspired systems.

★ Using Affordance-Based Design Principles for Phased MBSE Model Development

Presenters: **Stephen Guine** (Kelcey and Company, and Caltech CTME) and **Mel Wachtel** (Kelcey and Company)

Summary: When building MBSE Models, many organizational processes leverage established system architecture methods (OOSEM, MagicGrid, etc.) with subsequent direction to integrate physics-based models and simulations as required. While we can use project management approaches and tools to sequence and schedule this work, less had been said about taking a structured, value-added approach for building out the MBSE ecosystem. This paper proposes a framework for using Affordance-Based Design principles to structure the sequence, rationale, and potential value to be gained, while absolving the developing organization from the necessity to execute on those value options if there are deltas in present-term project realities. This presentation builds on the work of Galvao and Sato, "Affordances in Product Architecture: Linking Technical Functions and Users' Tasks, as well as others.

Presenter Biographies

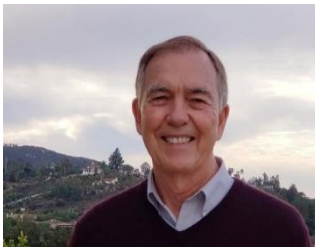
Dr. Art Villanueva

Dr. Art Villanueva operates at the intersection of artificial intelligence, emergence, and systems engineering. His research investigates complex adaptive systems (CAS), spanning topics from neural mechanisms in the human brain to autonomous unmanned aerial vehicles (UAVs). As the founder of Phronos, an AI services company, he is dedicated to applying AI and systems engineering principles across a wide range of domains. He also serves as a Senior Staff Engineer at General Atomics Aeronautical Systems, where he contributes to the advancement of next-generation aerospace technologies. Previously, Dr. Villanueva served as Chief AI Technologist for Dell Technologies' Federal Strategic Programs, where he directed the company's AI strategy for government initiatives. His multidisciplinary career spans large-scale defense and transportation projects, as well as entrepreneurial ventures in clean technology and renewable energy. An accomplished inventor and scholar, Dr. Villanueva holds multiple U.S. utility patents and has published several peer-reviewed papers. He earned a Doctor of Engineering in Systems Engineering from Colorado State University, focusing on meta-algorithmics for natural language processing. His academic background also includes dual master's degrees in Systems Engineering and Computer Science from UC San Diego, and a B.S. in Applied Mathematics from UCLA. Additionally, he is recognized as an Expert Systems Engineering Professional (ESEP) by INCOSE.

Chris Delp

Mr. Christopher Delp is an industry-recognized leader in Digital Engineering, MBSE, Systems Architecture, Systems Modeling, and open-source engineering solutions. With more than 25 years of experience at the Jet Propulsion Laboratory (JPL), he has played a pivotal role in advancing the organization's transition toward MBSE and Digital Engineering. He is the Technical Group Supervisor for Systems Product Solutions Engineering, where he leads efforts to create robust digital engineering environments and next-generation software solutions. Christopher also co-founded the OpenMBEE open-source project and leads the INCOSE Model-Based Environments Workshop, contributing significantly to the global MBSE and open-source communities. His career spans system architecture and design, development and testing of safety-critical software, and the application of systems engineering across the full project lifecycle. He has led major initiatives such as rearchitecting JPL's Model-Based Engineering Enterprise and developing the Model-Based Engineering Environment for the Europa Clipper mission, helping establish state-of-the-art modeling, simulation, and analytical capabilities grounded in open engineering principles. He holds a Master's degree in Systems Engineering from the University of Arizona.

David Schrunk, MD



David G. Schrunk is an aerospace engineer and medical doctor with specialization in nuclear medicine and diagnostic radiology. He is the author of multiple papers and presentations on topics of law, medicine, and space exploration. In 1995, Dr. Schrunk founded the Science of Laws Institute and, in 2005, he authored the book, “THE END OF CHAOS: Quality Laws and the Ascendancy of Democracy,” which describes the rationale for developing the science of laws. In 2022 he co-founded the INCOSE Systems Engineering and Lawmaking Working Group (SELAW), which is dedicated to the development of the science and engineering of laws. Dr. Schrunk is affiliated with the International Lunar Observatory Association (ILOA), AAAS, AIAA, NSS, and INCOSE. Dr. Schrunk and his wife reside in Poway, California.

Doug Rosenberg

Doug Rosenberg is the founder and CEO of Parallel Agile, Inc., and has been a leading figure in software and systems engineering as well as object-oriented design for over 30 years. His latest book, AI Assisted MBSE (AIM), is his ninth publication. From 1984 to 2014, Doug founded and led ICONIX Software Engineering. In the 1990s, he played a pivotal role in integrating the modeling approaches of Booch, Rumbaugh, and Jacobson, years before the development of UML. This methodology became known as the ICONIX Process. For the past decade, Doug has focused on bridging the gap between systems engineering and software engineering, recognizing that almost every modern system includes software, yet many systems engineering approaches overlook it. AIM represents a significant advancement toward achieving that integration.

Glenn Eberhardt

Mr. Glenn Eberhardt is the Vice President of Systems Engineering at G2 Ops, Inc., a leading firm specializing in model-based systems engineering (MBSE), cybersecurity engineering, and cloud services for government and commercial enterprises. His 20+ year career is built upon extensive government service with the Naval Surface Warfare Center, Philadelphia Division (NSWCPD) and PEO C4I, where he led technical design, testing, sustainment, and acquisition engineering for critical submarine antenna systems. This hands-on experience directly informs his current work in transitioning organizations to fully integrated MBSE environments. Mr. Eberhardt is an INCOSE Certified Systems Engineering Professional (CSEP) and a passionate advocate for using digital engineering to deliver data-driven solutions for mission-critical challenges.

Greg Bulla

Mr. Greg Bulla has worked in software and systems engineering domains for over 20 years. He currently supports the Naval Information Warfare Systems Command (NAVWAR) Headquarters division in conducting research and technical systems engineering reviews of large DOD programs. He serves as a software systems engineer at G2-OPS in San Diego. Greg's professional software experience includes the planning, design and development of time-critical targeting software, intelligent software agents, and tactical radios. His education includes a bachelor's degree in Aerospace Engineering and master's degree in Computer Science, and he holds active INCOSE CSEP certification. Greg is also a Past-President of the INCOSE San Diego chapter, leading the chapter in 2020, and received the San Diego chapter's Grady Outstanding Service Award in 2021.

Harshraj Bhoite

Mr. Harshraj Bhoite is a seasoned Data and AI Engineering leader with over a decade of experience building scalable, cloud-based data platforms and driving AI-driven transformation initiatives. With deep expertise in Databricks, Azure, and modern data architectures, he specializes in optimizing data pipelines, enabling real-time analytics, and ensuring cost-efficient solutions for enterprise clients. Harshraj combines strong technical acumen with strategic foresight, helping organizations evolve their data ecosystems through automation, observability, and innovation. Passionate about continuous learning and adaptability, he emphasizes designing modular, future-ready architectures aligned with emerging trends in data engineering and AI. He believes in simple, effective solutions, continuous improvement, and fostering innovation across teams. He currently works at LTIMindtree, a global technology consulting and digital solutions firm.

Dr. Jennifer Mariani

Dr. Jennifer Mariani currently serves as President and CEO of CharisTech Engineers and Consultants. Prior to founding the company in 2017, she held various roles in research and development, engineering, and management. Dr. Mariani possesses extensive expertise across various engineering disciplines, encompassing systems engineering and integration, requirements management, testing, and project controls. She has held roles at NASA Ames Research Center, Lawrence Livermore Laboratory, as well as in the defense sector, and has acquired substantial practical experience in systems engineering through her work with several organizations in the San Francisco Bay Area. Her primary interest lies in improving the design, built and delivery of transit projects by leveraging systems engineering methodologies and advanced software tools. Dr. Mariani earned her PhD in Mechanical Engineering from the University of California, Davis, an MS in Mechanical Engineering from the University of Michigan, Ann Arbor, and a BS in Chemical Engineering from California State University, Northridge.

Jeremy Jackson

Jeremy is currently in a mid-career leadership development program at Northrop Grumman that recently brought him to San Diego to work on Line of Sight systems and program captures. Previously, he has worked in Huntsville, AL and Colorado Springs, CO on a variety of projects including modeling and simulation, networking, and data analysis. While his roles are not always directly related to Systems Engineering, he brings a systems perspective to everything he does and works hard to implement digital transformation. Jeremy has an undergraduate degree in Aerospace engineering and a masters degree in Systems Engineering, both from Embry-Riddle Aeronautical University. Additionally, he is working towards a professional certificate in AI from Stanford. When not at work, you can find Jeremy catching a wave or hitting the slopes.

Dr. Johannes Gross

Dr. Johannes Gross is an engineer, builder, and architect. He creates conceptual architectures with hands-on expertise; building something that works and makes sense. Dr. Gross earned his PhD in Aerospace, Aeronautical and Astronautical Engineering, as well as his Diplom-Ingenieur, Aeronautical Engineering, Physics, from the University of Stuttgart.

Dr. Julia Taylor

Dr. Taylor is the owner of Taylor Success Systems. She is a Strategic Management consultant, a field very closely aligned with systems engineering, involving many of the same principles including systems thinking, interdisciplinary collaboration, consideration of the whole from the beginning, and use of processes in order to deal with complex systems. She received her PhD in 1992 from Alliant International University, San Diego, California, and has consulted for over 25 years.

Kenneth Cureton

Mr. Ken Cureton has over 48 years of successful programmatic and technical leadership in the aerospace, commercial and government sectors. He currently works at the University of Southern California (USC) in the Systems Architecting & Engineering program. Mr. Cureton serves as the Chair Emeritus of the Network-Centric Operations Industry Consortium NCOIC Technical Council, Systems Engineering and Integration Functional Team, Distance Education Working Group, and Knowledge Management Working Group. His commercial and government background is primarily in the design, development, and operation of highly efficient, low-cost computer systems, software, and data networks. His specialties include fault-tolerant computer systems (hardware and software), net-centric or net-enabled systems, union accounting systems, and Cloud Computing. He holds a BS in Physics from Cal State and an MS from the USC in Systems Architecting & Engineering.

Mark TenEyck

Mr. Mark TenEyck is an accomplished business executive with 30 years of experience in management, design, fabrication and building. He started his first business at the age of 19 in residential home building and design. He transitioned to an 18-year tenure with Dassault Systèmes in management selling innovative engineering solutions. He also designs and builds custom modern warm furniture sold in high end retail stores, is on the Advisory Board at Cerritos College and teaches computer aided design (CATIA) at Roosevelt High School. Mark has championed innovative methods for reduction of cost, scrap and environmental impact in product development. He is distinguished by his passion for business, focus on collaborative team building and commitment to delivering results. His contagious enthusiasm instills him and his team members with extraordinary energy and dedication in an environment where creativity and innovation are encouraged. A dynamic public speaker, teacher and mentor, Mark is a sought after presenter at meetings, team building events and conferences. He transmits key concepts in business innovation supported by smart adoption of technology to enable business to continually improve their products and processes while reducing their overall costs. Mark is passionate about his work and enjoys encouraging others to experience the dynamic of design and fabrication. He donates his time teaching in Boyle Heights and mentoring First Robotics Teams.

Mel Wachtel

Ms. Melody Wachtel specializes in strategic communications, project leadership, and stakeholder engagement. With a strong background in managing complex initiatives and delivering clear, impactful messaging, she drives organizational goals through effective coordination, creativity, and strategic vision.

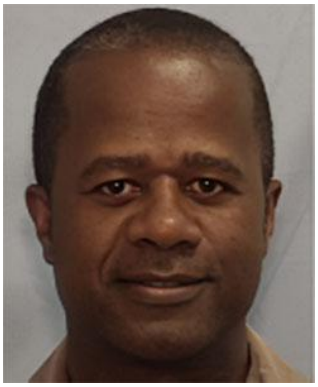
Persia Goudarzi

Ms. Persia Goudarzi is a PhD student in the Department of Engineering Management & Systems Engineering, School of Engineering and Applied Science at George Washington University. Her research interests are at the intersection of ML/AI, Global Navigation Satellite Systems, vulnerability assessment, system resilience and reliability. Persia is also a systems engineer at Raytheon, currently working in the Life Cycle Engineering and System Safety team within the Space and Airborne Systems (SAS) business unit. She completed Raytheon's Engineering Leadership Development Program, where she worked in year-long rotations as a components engineer, radiation and survivability engineer and EW systems engineer. Persia holds a B.S. in Aerospace Engineering and a M.S. in Biomedical Engineering from University of California, Los Angeles and Irvine. She also holds a Bachelor of Science and a Master of Science in Russian Studies from UCLA and Stanford, respectively.

Dr. Ray Madachy

Raymond Madachy, Ph.D., is a Professor in the Systems Engineering Department at the Naval Postgraduate School. His research interests include systems engineering tool environments for digital engineering, modeling and simulation of systems and software engineering processes, generative AI, and system cost modeling. He has developed widely used cost estimation tools for systems and software engineering, and created the Systems Engineering Library (se-lib). His books include Software Process Dynamics, What Every Engineer Should Know about Modeling and Simulation, What Every Engineer Should Know about Python; and co-authored Software Cost Estimation with COCOMO II and Software Cost Estimation Metrics Manual for Defense Systems.

Dr. Reginald U. Bailey



Dr. Reginald U. Bailey has over 40 years of experience working with complex enterprise level systems. He has developed, deployed, sustained, and managed systems across varied technical domains including C4ISR, satellite network communications, site automation and collection, cloud infrastructure frameworks, intelligence, data fusion, cargo security, machine learning, educational technology, and observability. He has taught systems engineering in the master and doctoral degree programs at George Washington University since 2016. His research interests include understanding the value and risk of TRAs for major defense acquisition programs, and effective portfolio management, as well as the use of NLP, ML, and AI in support of effective decision making, cybersecurity, regulatory compliance, and B2B sales forecasting. Dr. Bailey holds a Ph.D. and Master of Science in Systems Engineering from George Washington University. He also holds a Bachelor of Arts in Computer Science from the University of California Berkeley.

Dr. Rick Hefner

Dr. Rick Hefner is the Executive Director of the Caltech Center for Technology and Management Education (CTME), where he designs and delivers professional programs for technology-driven individuals and organizations. With over 40 years of experience in systems engineering, Dr. Hefner has worked in academia, government, and industry. He is active in INCOSE, and has served as a Los Angeles chapter president and conference chair. He has given over 30 INCOSE presentations and tutorials and was the 2021 recipient of the INCOSE International Outstanding Service Award.

Robert Karban

Mr. Robert Karban is the CTO of Planetary Utilities and a former Principal Systems Engineer at the Jet Propulsion Laboratory (JPL), where he specialized in model-based systems engineering (MBSE) for more than 30 years. A longtime instructor for Caltech CTME's digital engineering and MBSE programs, he brings a practical, problem-solving focus to his teaching - rooted in deep experience modeling complex systems for NASA missions, large observatories, and interdisciplinary engineering teams. His leadership has shaped major MBSE efforts including the Thirty Meter Telescope project, JPL's Enterprise System Modeling initiative, and NASA mission modeling for the Endurance Lunar Rover, Perseverance Helicopter Ingenuity, and Mars Sample Return concepts. Robert holds a Master's degree in Computer Science from the University of Technology, Vienna, Austria, and is a recognized leader in the MBSE community. Robert co-founded OpenMBEE, co-chaired the SysML Revision Task Force for the OMG, and represented NASA and JPL on the SysML v2 submission team. He previously led the INCOSE Telescope Modeling Challenge Team, earning INCOSE's Achieving the Systems Engineering Vision award, and has been honored with two JPL Voyager Awards for advancing modeling capabilities across the institution.

Robert Weaver

Rob Weaver serves as the Mission Engineering Department Head at Naval Information Warfare Systems Command (NAVWAR), where he drives policy and process for Systems-of-Systems Engineering, Enterprise Architecture, Digital Engineering, and Mission Analysis across the Naval Information Warfare Domain. He leads the NAVWAR Digital Engineering Transformation spanning PEO C4I, PEO DES, and PEO MLB, and oversees key efforts including Trident Warrior experimentation, advanced and additive manufacturing initiatives, and Joint/Coalition Interoperability across the NAVWAR portfolio. Previously, Mr. Weaver was the Digital Engineering & Mission Analysis Division Head and Digital Engineering Lead for NAVWAR, and an Acquisition Program Manager for PMW 120 and PMW 790, supporting multiple Programs of Record. Before joining the Federal Civilian Workforce in 2009, he served as a Surface Warfare Officer with tours on USS RENTZ, 3rd Battalion 12th Marines, and the National Reconnaissance Office. He holds a B.S. in Naval Architecture from the U.S. Naval Academy and an M.S. in Engineering Administration from Virginia Tech.

Sean Densford

Mr. Sean Densford holds an Associates in Music Education, Bachelor's in Electrical Engineering, and a Master's in Systems Engineering from Johns Hopkins University. He has worked over decade in DOD as a Research Assistant in Electromagnetics for government sponsored programs, Special Test Equipment Engineer, Test Engineer, and MBSE in development, production, and sustainment programs at RTX. He has spent the latter half of his career developing suites of sensor models, developing report generation methodologies for Cameo, leading groups of engineers in development of sensor models, developing training, best practices, and processes for MBSE. He is an OMG Certified Systems Modeling Language Professional and a Certified Systems Engineering Professional. His current role is lead of SysML V2 Training Development for North America at Dassault Systèmes.

Dr. Sri Harsha Maramraju

As an INCOSE Certified Systems Engineering Professional (CSEP), Dr. Sri Harsha Maramraju's collective experience includes over a decade in the Systems Engineering domain, witnessing the life cycle (concept to launch) of novel medical systems and applying Systems Engineering principles in Class I, Class II and Class III medical devices. Sri Harsha has worked with customers and cross-functional teams to deploy several SE process improvement initiatives in medical device industries – in requirements management, V&V and product launches. He managed the installed base of PET/MR imaging systems while at GE Healthcare, supported design controls activities for the novel Surgical Robotics platform at Johnson & Johnson and led Systems Engineering team at Abbott Diagnostics. He currently holds a SE leadership position at Dexcom driving adoption of Systems Engineering across the division. Sri Harsha received his Ph.D. in Biomedical Engineering from Stony Brook University, NY. He is also a panel reviewer for INCOSE symposiums and a member of various working groups.

Stephen Guine

Mr. Stephen Guine is an INCOSE Certified Systems Engineering Professional, the current president of The San Fernando Valley Engineers' Council, and the Managing Partner of Kelcey and Company, a technology consigliere firm that focuses on professional development of early to mid-career systems engineers and project managers as well as trusted third-party system engineering audits. Stephen is an Instructor of Systems Engineering and Aerospace Project Management at the Caltech Center for Technology and Management Education. To this role he brings 21 years of experience at Northrop Grumman in low observable platforms, directed energy, tactical air armaments, and directed energy weapons. Additionally, he brings systems engineering experience from public utilities and the public and private healthcare domains. And most importantly, Stephen is a proud veteran of the United States Marine Corps.

Suresh Narayanan

Mr. Suresh Narayanan is a systems engineer with over 25 years of experience developing medical devices, including CT scanners, interventional tools for coronary artery disease, and in-vitro diagnostic systems for pathogen detection. His designs support over 40 million patients each year and generate more than $5 billion annually. He accelerates innovation by helping industry teams adopt systems engineering tools and excels in architecture selection, risk management, FMEA, and model-based systems engineering. His work in the highly regulated medical-device sector has strengthened his expertise in documentation and process discipline. He is also exploring how LLMs can enhance systems-engineering productivity. He applies principles from the NASA Systems Engineering Handbook and views systems engineering as the art of creating safe, effective, value-focused solutions. Suresh holds a Master's in Aerospace & Mechanical Engineering from Boston University and a Bachelor's from IIT Madras.

Walter Stamirowski

Mr. Walter Stamirowski is a seasoned electrical systems executive with several decades of demonstrated hands-on experience in engineering consulting, construction management, operations and executive management in the rail transit industry including Heavy Rail (HRT), Light Rail (LRT), Class1 railroad, and DMU transit projects. He is skilled in managing multi-disciplinary teams and performing field construction management, systems design oversight, testing, safety certification, rail activation and commissioning, as well as experience in interacting with governmental and transit agency personnel and community leaders. Areas of expertise include Program and Project Management, Systems Design Integration, Requirements and Interface Management, Project Controls including Cost Estimating and Scheduling, QA/QC, and Safety Certification processes. Walter has extensive on-site field experience managing installation of traction power systems, train control, signaling and communications systems as well as industrial power distribution and control systems in power plants, chemical process and water facilities. He has guest-lectured on electrical systems construction at the University of California Berkeley and is passionate about sharing his experiences.

Acknowledgements

We want to thank our sponsors, donors, and volunteers. Without them we could not have pulled off this event.

We look forward to offering future opportunities to contribute to the Systems Engineering Community. Please check out the upcoming activities hosted by the San Diego, Los Angeles and other INCOSE chapters.

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After Hours!

After a hard day of Systems Engineering, What do you do ????????

Join us for an evening of socializing as Systems Engineers

Friday December 5th, 5:30 PM
Join us at Crust & Brew
4653 Carmel Mountain Rd Ste 311, San Diego, CA 92130

Saturday December 6th, 5:30PM
Join us at Oggi's Mission Valley
2245 Fenton Parkway Ste 101, San Diego, CA 92108

Oggi's
SPORTS | BREWHOUSE | PIZZA

IF you still feel adventurous, let's head to San Diego December Nights. Open Friday (3PM-11PM) and Saturday (11AM-11PM)