

## INCOSE San Diego Mini-Conference 2017 SCHEDULE

Time	UCC Center Rooms 315, 316 and 317, UCSD Extension 6256 Greenwich Drive, San Diego, CA 92122	
8:00-9:00		<a href="#">Sign In / Networking / Lite Breakfast</a>
9:00-9:10		<b>WELCOME</b> by INCOSE San Diego Chapter President Mr. Richard Bryson
		Acknowledgement of Platinum Sponsor <a href="#">Jama Software</a>
9:10-9:50		<b>Morning Keynote – “The Practical Application of Model Based Systems Engineering (MBSE) in Large Complex Systems.”, Mr. Greg Shaffer, US Navy SPAWAR Headquarters</b>
9:50-10:00	Break	
	<b>Track 1.1 - SoS Systems Engineering (Room 315)</b> Chair: Dr. John Wood  “Agile and Systems Engineering: The Odd Couple”  Dr. John Wood and Dr. Glenn Tolentino	<b>Track 2.1 - Big Data Trends &amp; Practices (Room 316)</b> Chair: Dr. Jim Meng, UCSD SDSC  “Big Data Visualization and Analytics in Structural Biology”  Dr. Peter Rose, UCSD SDSC
10:10-10:50	“Do No Harm - Autonomous System”	“Data Visualization for Decision Making”
10:50-11:30	Mr. Jack Ring, OntoPilot LLC	Dr. Jim Meng, UCSD SDSC System
	<b>Track 1.2 - Science of Laws in SE</b> Chairs: Dr. Ray Madachy, Dr. John Wood  “Application of System Engineering to the Affordable Care Act & Other Lawmaking Practices.”  Ms. Thy Quintivano	<b>Track 2.2 - Interoperability</b> Chair: Mr. Abbas Rostami  “Interoperability and System-of-Systems Engineering in Unmanned Aircraft Systems”  Mr. Richard Bryson, Northrop-Grumman
11:30-12:10	Lunch	
12:10-12:30		
12:30-13:10	“System Dynamics Behaviors for Modeling Lawmaking Processes”  Dr. Ray Madachy	“Standardized Architectural Approach In Affordably Achieving The Interoperability Of Heterogeneous Hardware Systems.”  Mr. Howen Fernando, Joint Tactical Networking Center. Deputy DoD Waveform Standards, SSC-PACIFIC.
13:10-13:50	“An Architecture Scaffolding for Analyzing Overlap and Conflict between Laws”  Dr. Beryl Bellman, Mr. Prakash Rao, & Dr. Ann Reedy	“ALM Interoperability: Past, Present, Future”  Mr. Deric Merlon, JamaSoftware
13:50-14:00	Break	
14:00-14:40	“Legislative Bills: Design Criteria and Assessment”  Dr. David Schrunk	“SoS Interoperability”  Ms. Mahasa Zahirnia. Northrop Grumman
14:40-15:20	“Hitchins’ 5-Layer Model as an Evaluation Framework for Regulations”  Mr. John "Mike" Green and Dr. Ray Madachy	“Interoperability Panel - SE Challenges & How INCOSE Can Help?”  Speakers: Mr. Richard Bryson, Mr. Howen Fernando, Ms. Mahasa Zahirnia, Mr. Deric Merino
15:20-15:50	“Maturing Humanity.”  Dr. Bob Krone	Moderator: Mr. Abbas Rostami
15:50-16:00	Close Out	

# Topics and Speaker Bios – 2017 INCOSE San Diego Mini-Conference



**Speaker: Mr. Greg Shaffer**

**Assistant Chief Engineer Mission Architecture and System Engineering  
National Competency Lead ISR/IO  
Space and Naval Warfare Systems Command**

**Title: [Morning Keynote](#)**

**Abstract:** Discussion of the practical application of Model Based Systems Engineering (MBSE) in large complex systems. MBSE, when considered in the context of Systems Engineering (SE), Systems-of-Systems-Engineering (SoSE) and Enterprise Architecture (EA), provides the opportunity to understand how a product behaves in the larger capability ensuring that it is both resilient and interoperable with other products and meets performance and mission requirements.

**Biography:** Greg Shaffer

Mr. Shaffer serves as the Assistant Chief Engineer, Mission Architecture and Systems Engineering, at the Space and Naval Warfare Systems Command (SPAWAR) Headquarters where he is responsible for establishing architecture and engineering policy and processes for C4ISR, Business/IT and Space Systems. He is the authority in the area of Systems Engineering and Systems-of-Systems Engineering. He is also the SPAWAR National Competency Lead for Intelligence, Surveillance, and Reconnaissance (ISR) and Information Operations (IO). As the SPAWAR Chief Engineer's Deputy Warranting Officer for Mission Engineering, he is responsible for implementing and exercising technical authority in the ISR and IO domain. Previously, Mr. Shaffer served as the Assistant Chief Engineer, Mission Engineering at Space and Naval Warfare Systems Command.

Mr. Shaffer began his federal career in 1990 as a software engineer in the Anti-Submarine Warfare Fire Control System program for the undersea warfare community at the Naval Ocean Systems Center, now the Space and Naval Warfare Systems Center Pacific (SSC Pacific) in San Diego, California. He led a variety of technical projects developing innovative capabilities for the Navy, Special Operations, and the Intelligence Community. He led the technical development of several capabilities supporting National Systems.

In April 2005, Mr. Shaffer was selected as the Manager for the Information Operations Division at SSC Pacific. The Division focused on basic research and emerging technologies used in maritime surveillance, signals processing and exploitation, data correlation and fusion, electronic warfare, information operations, and military deception for a variety of Navy, Joint, National, and Intelligence Community sponsors. In September 2008, Mr. Shaffer was selected as the Deputy Department Head for the Intelligence, Surveillance, and Reconnaissance and Information Operations Department.

Mr. Shaffer was appointed to the Senior Executive Service in December 2011 as the Head of the Intelligence, Surveillance, and Reconnaissance and Information Operations Department at SSC Pacific. He led a diverse and highly technical team of over 600 scientists, engineers, technical specialists, and administrative staff members. He was

responsible for an annual budget of \$400 Million supporting research, development, acquisition, test and evaluation in the intelligence, surveillance and reconnaissance and information operations domains.

Mr. Shaffer received a Bachelor of Science in Computer Science from San Diego State University in 1988 and a Master of Science in Software Engineering from National University in 1990. He received the Navy Meritorious Civilian Service Award in 2010.



**Speakers:** John Wood, Ph.D., Glenn Tolentino, Ph.D.

### Title: Agile and Systems Engineering: The Odd Couple

**Abstract:** The agile development approach has become a de facto standard in software projects. Concurrently, software has become a critical component in many, if not most, DoD acquisition projects. As such, systems engineers supporting DoD projects must know the strengths and weaknesses of agile as well as how to integrate an agile approach within the systems engineering process. This presentation will use examples from a Navy data analytics project to illustrate how agile development and systems engineering can live in balance, capitalizing on each other's benefits while minimizing each other's weaknesses.

#### **Biography:** John Wood, Ph.D.

John Wood, Ph.D. has spent his career pursuing a penchant for perfection in areas where less-than-perfect performance can be deadly. During more than two decades in military service, civilian sector innovation, and academia, he has applied his systems engineering expertise to advance high-profile programs in healthcare delivery, aviation prognostics and health management, nuclear weapon infrastructure, and more. John earned a Bachelor of Science in electrical engineering from the U.S. Naval Academy and a Ph.D. in systems engineering from the George Washington University.

#### **Biography:** Glenn Tolentino, Ph.D. is a Senior Systems Engineer for the Command and Control Department at Space and Naval Warfare Systems Center located in San Diego, CA.

During the past 23 years, Dr. Tolentino has been directly involved as a software and systems engineer in the design, development, integration, and deployment of national level systems in the area of Command, Control, Computers, Communication, and Intelligence Systems. His current research interests include system of systems, complex systems lifecycle, systems reliability, operational readiness, and mission reliability. Dr. Tolentino holds a Bachelor of Science Degree from San Diego State University in Applied Mathematics with an emphasis in Computer Science, Master of Science Degree in Software Engineering and a Ph.D. in Computer Science from Southern Methodist University.



**Speaker:** Mr. Jack Ring, INCOSE Fellow, Managing Member, OntoPilot LLC

### Title: Do No Harm

**Abstract:** To realize the benefits of autonomous system we must ensure they Do No Harm. One clear example is the ongoing dialog regarding the liability for choices made by 'driverless vehicles.' Current systems engineering standards, handbooks and tools do not guarantee that deployed autonomy is Fit For Purpose 'when and while needed.' We must

replace three methods from the era of prescient design, notably, Requirements Management, Risk Management, and TEVV. We must revise the current notion of Cyberspace. This session offers alternatives to each in order to promote further dialog.

**Biography:** Jack served 20 years with GE Aerospace, 10 with Honeywell Large Systems and 30 helping high tech turn-arounds and start-ups. His early successes in devising sociotechnical systems in aerospace, industrial, commercial and public service domains exceeded stakeholder expectations and demonstrated excellent Operational Availability. He has been named Fellow, International Council on Systems Engineering; Industrial Fellow, Stevens Institute of Technology; and Senior Analyst, Cyon Research. He co-authored patents for the General Purpose Set Theoretic Processor. He co-founded Kennen Technologies LLC and OntoPilot LLC for introducing new ways of formulating fault-free, autonomous systems for non-deterministic situations and co-founded Educe LLC a WOMO enterprise for accelerating SySTEAM learning by all ages world-wide.



**Speaker:** Ms. Thy C. Quintivano

**Title: The Application of Systems Engineering to the Affordable Care Act and Other Lawmaking Practices**

**Abstract:** The Patient Protection and Affordable Care Act, often referred to as the Affordable Care Act (ACA), is a United States federal statute enacted by Congress and signed into law by President Barack Obama on March 23, 2010. The provisions represent the U.S. healthcare system's most significant regulatory overhaul and expansion of coverage since the passage of Medicare and Medicaid in 1965 and it mainly expanded access to health insurance and changed the way federal government pays doctors. These provisions required new taxes and conformance of health insurance that impacted small businesses, large employers, and most Americans.

Many complexities impacted the preparation of ACA implementation and adherence to these provisions. This paper specifically discusses how the systems engineering framework was applied to systems validation activities and it describes unique insights, challenges, and future opportunities where systems engineering can benefit future lawmaking initiatives.

**Biography:** Thy Quintivano is a Systems Engineer and Project Manager who helps organizations achieve their objectives through the realization of systems development and integration activities. She received her Master of Science in Systems Engineering from the Johns Hopkins University and Master of Science in Administration from Central Michigan University. She holds the Project Management Professional (PMP) and Information Technology Infrastructure Library (ITIL v3) certifications.

As a Systems Engineer, she has worked for Booz Allen Hamilton, Deloitte, and Intuit. She leads business case analysis, requirements engineering, user interface design, test planning, and governance activities.

Her past clients include: a Fortune 500 Energy and Utilities company, the Internal Revenue Service, the Department of Defense and Executives of major organizations.



**Speaker:** Raymond Madachy, PhD

**Title: System Dynamics Behaviors for Modeling Lawmaking Processes**

**Abstract:** System dynamics is a simulation methodology for modeling continuous systems. It provides a rich and integrative framework for investigating lawmaking process phenomena and inter-relationships from a holistic perspective. This paper continues last year's work on common structures for lawmaking processes by elaborating the dynamic behaviors resulting from the structures. The behaviors are visualized as process trends over time. These model structures and associated behaviors are process patterns that frequently occur, and are provided as reusable building blocks to assemble larger models. Examples are shown of typical behaviors resulting from the elemental structures, and larger models demonstrating behavior patterns of lawmaking processes including feedback loops.

This paper reviews basic system dynamics elements and their applied instances in lawmaking, generic flow processes which are microstructures with characteristic behaviors, larger infrastructures producing more complex behaviors, and flow chains which are infrastructures consisting of a sequence of levels and rates (stocks and flows) that are model portion backbones. New examples of assembled small models for lawmaking applications will be described, simulated, and conclusions drawn from the behaviors.

Even small system dynamics models have been shown useful for understanding complex public policy issues and thus well suited to assess specific laws or aspects of overall local, national and international lawmaking. The developed open source models will be provided to the community to incorporate, adapt and apply for lawmaking.

**Biography:** Modeling and simulation can help improve lawmaking processes. System dynamics is a simulation methodology for modeling continuous systems that provides a rich and integrative framework for investigating lawmaking process phenomena and inter-relationships from a holistic perspective. Structures for modeling these processes are provided as reusable building blocks. These structures and their behaviors are process patterns that frequently occur. Examples are shown assembling these recurring structures into larger models demonstrating behavior patterns of lawmaking processes including feedback loops. The behaviors are visualized as process trends over time.

This paper overviews: 1) basic system dynamics elements and their applied instances in lawmaking, 2) generic flow processes which are small microstructures comprised of a few elements serving as modeling molecules with characteristic behaviors, 3) infrastructures composed of several microstructures producing more complex behaviors, 4) flow chains which are infrastructures consisting of a sequence of levels and rates (stocks and flows) that are model portion backbones, and 5) introductory examples of lawmaking process structures.

Even small system dynamics models have been shown useful for understanding complex public policy issues, and thus well suited to assess specific laws and/or aspects of local, national and international lawmaking processes. The structures and applied examples are provided as open source models for the community to incorporate, adapt and apply for lawmaking.



**Speakers:** Beryl Bellman, Ann Reedy, PhD, PhD, Prakash Rao

### Title: [An Architecture Scaffolding for Analyzing Overlap and Conflict between Laws](#)

**Abstract:** Based on years of research and practice in the field of government and defense laws and mandates for enterprise architecture, we present a systematic method for analysis of multiple laws to find intersections, overlaps and conflicts using the six interrogatives framed by Zachman and an ontology based approach. Use of this approach in a consistent manner lends itself to automation and the application of data analytics to the repository of architecture elements. Our approach provides a standard way of describing the key elements of a law and can be used to determine conflicts and overlaps between laws. This approach can also be applied to describe the full stakeholder context of a proposed law to determine impacts and omissions. The use of the 6 interrogatives provides a complete decomposition

of the architecture elements that are embedded inside the narratives of the laws and provides a method to transform a narrative, human intensive understanding into a man-machine understanding problem.

**Biography:** Beryl Bellman, PhD

Dr. Bellman is co-founder and Academic Director of the FEAC™ Institute and is also a tenured full Professor of Communication Studies at California State University at Los Angeles. He has been involved in teaching, research; publishing, consulting and project management in the fields in Enterprise Architecture for over 45 years, and has an excellent reputation in both academe and professional consulting. He held faculty and research positions at the University of California at San Diego, SUNY Stonybrook, CUNY Graduate Center and California Institute of the Arts, and was Research Director of the Western Behavioral Sciences Institute prior to his current university position. In addition to academic positions he has thirty plus years concurrent consulting experience in both government and the private sectors. He holds enterprise architecture certifications in FEA, DoDAF, Zachman, TOGAF 8 and TOGAF 9.

**Biography:** Ann Reedy, PhD

Dr. Reedy has a PhD in Computer Science with more than 40 years of experience in academia and Federal research and contracting communities. She taught computer science at both the University of Iowa and the University of Nebraska, Lincoln. After working with analyst support systems and software development environments in the Federal contracting community, she focused on Enterprise Architecture. While working for the MITRE Corporation, a Federally Funded Research and Development Center, she was one of the principal developers and editors of the C4ISR Architecture Framework and worked on its evolution into the DoD Architecture Framework (DoDAF).

She has adapted the DoDAF for various federal organizations and agencies and supported a wide variety of DoDAF based enterprise architecture startups as well as helping agencies develop enterprise architecture governance processes. These agencies included Treasury, Customs, Internal Revenue Service, and Federal Aviation Administration, as well as DoD projects. While at MITRE, her research topics include the integration of security concerns and the use of pattern based approaches in enterprise architecture.

She taught enterprise architecture to groups supporting the U.S. Federal government through the MITRE Institute and through the Federated Enterprise Architecture Certification (FEAC) Institute for over 10 years, as well as co-authoring a textbook for the FEAC.

Now retired from MITRE, she continues to pursue research into new enterprise architecture concepts and approaches.

**Biography:** Prakash Rao

Prakash Rao has 38 years of experience as a researcher, innovator and entrepreneur involved with startup, management, product innovation and evolution of three different companies; as a teacher and trainer for Enterprise Architecture for the US Air Force for three years and a faculty member at the FEAC Institute for more than 7 years, and an early pioneer, consultant and practitioner of enterprise architecture for more than 20 years.

With a first degree as an Electronics Engineer, Prakash started his professional career at Honeywell Corporation in the Corporate Technology Center/ Computer Sciences Center after completing graduate studies in Computer Science at the University of Minnesota. He worked as a Research Scientist/Senior Research Scientist working on innovations in electronic Design Automation and Architecture development.

Prakash is the co-author of two books on Enterprise Architecture and Data Warehousing published by McGraw-Hill and Que/MacMillan respectively and has presented at many conferences in his professional career.

Currently he is the Chief Executive Officer of Enterprise Sherpas LLC in Fairfax, Virginia, USA innovating tools and techniques in enterprise architecting that leverage and adapt some of the concepts of electronic design automation – concepts that have revolutionized the design of complex electronic systems over the last twenty years and delivered the products of today. Enterprise Sherpas LLC provides mentoring and coaching in the use of rapid EA techniques for competitive advantage and to fuel corporate fire-fighting efforts using innovative tools, technique and methodologies.

Prakash Rao has been actively working in Information Technology since 1977, and in Information Resource Management since 1988 and was one of the co-founders of the first commercial standards based IRM repository company more than 15 years ago. With more than 30 combined years of experience in computer science research and development, modeling and simulation, software engineering and lifecycle management, departmental, corporate and executive management and strategy, enterprise architecture consulting, training and coaching, he was also the author of one of the earliest books on Data Warehousing "Client Server Guide to Data Warehousing" 1995 published internationally in English, Spanish, Dutch and German. He has been involved in the training of more than 600 enterprise architects at the executive, management and staff levels over a period of three years at the US Air Force and several hundreds more as a faculty member at the FEAC Institute.

Prakash is a Certified Enterprise Architect with an MS in Computer Science from the University of Minnesota, Minneapolis and a BSEE from Bangalore University, India. He is a member of several professional societies and participates actively in outreach and advocacy for enterprise architecture amongst startup professionals, as well as seasoned corporate managers and the lay public.

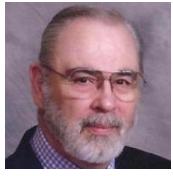


**Speaker:** David Schrunk, MD

**Title:** [Legislative Bills: Design Criteria and Assessment](#)

**Abstract:** The task of engineers is to solve problems by the creation of new, efficacious implements, devices, and systems. To meet this design challenge, engineers observe problem-solving protocols and apply appropriate design tools and expertise for the creation of new tools, or technology. Similarly, the task of lawmakers of government is to solve societal problems by the creation of new law-solutions (laws of government). This paper reports on a study that evaluated the extent to which the first steps of the lawmaking process, i.e., "law-design engineering," adhere to established, problem-solving standards for the creation of new tools. The study focused on bills (proposed new laws) that were submitted to the Senate of the Legislature of the State of California during the 2016 legislative session. The study observed that the present lawmaking process does not meet established problem-solving protocols and design standards, and it thereby places the public at risk from the issuance of poorly designed laws. It is recommended, for the benefit of legislators and the public they serve, that new high-quality design standards be developed and applied to the creation of new laws of government.

**Biography:** David G. Schrunk is an aerospace engineer and medical doctor. He is the president and founder of the Science of Laws Institute of Poway, California, and is the author of multiple publications in the science and law literature on topics related to the expansion of science to encompass laws of government and the lawmaking process. Dr. Schrunk is also the author of the book, THE END OF CHAOS: Quality Laws and the Ascendancy of Democracy, published by QL Press, 2005.



**Speakers:** John "Mike" Green & Raymond Madachy, PhD

**Title:** [Hitchens' 5-Layer Model as an Evaluation Framework for Regulations](#)

**Abstract:** The relationship between society and laws is well understood. At the macro level, laws provide structure to guide behavior and systems theory is replete with multiple models that describe various aspects of that behavior. This

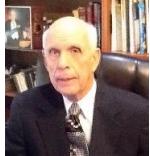
paper proposes using a 5-layer model of systems engineering developed by Hitchins to examine the impact of laws and regulations on the various socio-economic structures of a society. The specific focus is a simple example of energy policy with an emphasis on developing causal relationships between laws and society using systems theory. The five layers: socio-economic, industry, business-enterprise, project, and product form a nested relationship with product at the center. Causal loop models based upon N2 diagrams show the interactions within and between layers providing insight into a change in policy.

#### **Biography:** John Green

John M. Green is a Senior Lecturer in the Department of Systems Engineering at the Naval Postgraduate School where his teaching and research is focused on combat system engineering and combat system architectures. In the 15 years since the inception of the MSSE program, he has advised over 60 MSSE Capstone projects of three quarters duration each. Prior to this he worked in industry for 18 years. He was Manager of Advanced Systems at ITT Gilfillan in Van Nuys, CA where he led a team developing concepts for high power solid state radars and he also worked for Lockheed Martin in Moorestown, NJ where he was Technical Director for the Norwegian Frigate project and System Engineer for the Taiwanese PFG-2 Class Combat System design. He also worked several data fusion projects including CEC and JCTN. During his Navy career, he served on a variety of ships including six submarines rising from Seaman Recruit to Lieutenant Commander. He is a 1982 graduate of the Naval War College, College of Command and Staff.

His MBA (1998) and MS in Computer Science (1986) are from the University of New Haven. He also has a MA in International Relations from Salve Regina College (1984), a BS in Physics from Saginaw Valley State University (1972) and an AS in Electronics from Southwestern College (1969). He is current pursuing a doctorate in Systems Engineering from SMU.

He is a Senior Member of AIAA and a member of the Military Operations Research Society, the American Society of Naval Engineers, the Institute for Operations Research and Management Science, the Association of Old Crows, SPIE, ISIF, and the International Council on Systems Engineering.



**Speaker:** Bob Krone, PhD

#### **Title:** [Law of Space Abundance](#)

**Abstract:** Humanity's future hinges on the success of efforts to insure a supportive environment, needed resources, and continuous improvement of health and welfare for all its citizens on Earth and for humans who settle in Space. The Law of Space Abundance was created by leadership of the Kepler Space Institute in 2009. The Law states: "Space offers an abundance of resources for humankind's needs." The law was not legislated by humans. It accurately describes what exists in the universe. The capturing of those resources is now being designed and planned. The unprecedented efforts to do so will involve entirely new systems for Space exploration, development and the creation of human settlements in Lunar Orbits, on the Moon, Mars and elsewhere in the Solar System. This paper addresses some of the needs of the human control and management process for that massive effort. In particular, it focuses on the leadership, legal and governance portions of that huge vision. The major finding of the paper is that the concepts, principles and legal systems being designed and accumulated by members of the Science of Laws Institute -- to overcome historic legal systems' inadequacies, problems and failures -- provide the foundations for solving the human behavior needs for the future of humans in Space. Those foundations can be found in the published issues of the Science of Laws Journal.

**Biography:** Dr. Bob Krone, currently 87 years old, is in his fourth professional career. Those four careers were: The United States Air Force (1952-1975), The University of Southern California in Los Angeles (1975-1993), a mixed career with La Sierra University and the University of South Australia (1993-2007), and The Global Space Community (1980 -

present). Bob has authored or co-authored twelve books and ninety professional journal articles, including twenty-seven articles in the published issues of The Journal of Space Philosophy, accessible at: [www.keplerspaceinstitute.com/JSP](http://www.keplerspaceinstitute.com/JSP).

Bob reviews his 87 years in his article, "A Personal Philosophy: Know Thyself" in the Spring 2015 Issue, Vol 5, No. 1 of The Journal of Space Philosophy.



**Speaker:** Peter Rose, Ph.D., UCSD San Diego Supercomputer Center

**Title: Big Data Visualization and Analytics in Structural Biology**

**Abstract:** Advances in experimental techniques have led to an explosion in both the number and size of macromolecular structures in the Protein Data Bank (PDB). For this reason, the network transfer, visualization, and processing of macromolecular data has become increasingly time-consuming. We describe how we overcame these bottlenecks by applying data compression combined with distributed parallel processing using the Apache Spark framework (<https://mmtf.rcsb.org>).

**Biography:** Dr. Peter Rose is the Director of the Structural Bioinformatics Laboratory and Lead, Bioinformatics and Biomedical Applications, Data Science Hub at SDSC. Since joining SDSC in 2007, his group built the RCSB Protein Data Bank to its current strength as a key resource in biology and drug discovery. He currently works on NIH funded Big Data to Knowledge (BD2K) projects to enable large-scale mining of 3D macromolecular structures. Prior to joining UCSD, he held research and management positions at Pfizer La Jolla, formerly Agouron Pharmaceuticals, where he was instrumental in the establishment of the structure-based drug design platform. His research interests include structural bioinformatics, structure-based drug design, 3D visualization, and application of big data technologies and machine learning in bioinformatics and biomedicine.



**Speaker:** Dr. James Meng, UCSD SuperComputer Center Senior Fellow.

**Title: Digital Transformations and System Engineering of Standardizations**

**Abstract:** Digital Transformations have progressed to impact every aspects of our daily work and life. Several clear effects have emerged, they are: Digital Divide Reversal Effect, Much Larger Trust Footprint Effect, Automation Effect, Amazon/Ebay Effect and Free Content Effect. Digital transformation is largely possible due to many standardization efforts. The large data bases were organized by syntactic standards, sentences by semantics and relationships by ontologies to structure unstructured data. System Engineers have great many opportunities to participate and support these efforts.

**Biography:** My Core Competencies are Large Complex Systems Design, Interoperable Architecture, Systems Integration and Value Delivery. Previous positions held were: Deputy Assistant Secretary of the Navy, Architectures, Standards and Integration, Office of the Assistant Secretary of the Navy, Financial Management and Comptroller; Science Technology Engineering & Mathematics Executive, office of the Assistant Secretary of the Navy, Research Development & Acquisition; and Executive Director, Warfare Systems Engineering Directorate, NAVSEA06B, Washington, DC, and also Chief Systems Engineer Carrier Battlegroup.



**Speaker:** Mr. Richard A Bryson

**Title:** [Interoperability and System-of-Systems Engineering in Unmanned Aircraft Systems](#)

**Abstract:** Evaluates several questions of interoperability and systems-of-systems engineering, including what exactly is interoperability? How does it relate to system-of-systems engineering? What is best approach to development of interoperable systems: top-down, bottom-up, or something else? Are there any interoperability standards? Then provides examples of how interoperability was infused into complex unmanned aircraft and ground control systems.

**Biography:** Mr. Bryson has a BS Mathematics from University of Redlands, 1978 and MS Computer Science from University of Southern California, 1983. His professional experience spans the systems development life-cycle from pre-proposal IR&Ds and studies through proposal management, systems engineering, project management, software development, integration & test, and flight testing to operations & maintenance. Areas include avionics, commercial communications, imagery processing, and unmanned air systems, as well as adjunct instructor of software engineering principles and management. Most recently served as the lead interoperability engineer for the Global Hawk and the Common Mission Control Center programs at Northrop Grumman Corporation. Currently also serving as president of the INCOSE San Diego Chapter.

**Speaker:** Mr. Howen Fernando

**Title:** [Standardized Architectural Approach in Affordably Achieving the Interoperability of Heterogeneous Hardware Systems](#)

**Abstract:** A recent article from Defense One, titled - The Future the US Military is Constructing: a Giant, Armed Nervous System - says: "Leaders of the Air Force, Navy, Army and Marines are converging on a vision of the future military connecting every asset on the global battlefield." It was only a matter of time before the connectivity we have grown accustomed to in our civilian lives also becomes part of our military lives. Unfortunately, there are many hurdles to overcome before this vision becomes reality for the military. One hurdle is INTEROPERABILITY - how should the military, which has countless heterogeneous hardware systems to communicate with one another, ensure they can achieve interoperability in the current fiscal climate? This presentation provides a standardized architectural approach in affordably achieving the interoperability of heterogeneous hardware systems.

**Biography:** Mr. Howen Fernando, has a B.S Electrical Engineering degree from California State Polytechnic University and is completing a M.S. Systems Engineering degree at the Naval Postgraduate School. With 18 years at SPAWAR Systems Center – Pacific, 16 of 18 years involved in special communications.

**Speaker:** Mrs. Mahasa Zahirnias

**Title:** [System of System Interoperability](#)

**Abstract:** Achieving large-scale and consistent interoperation among systems will require a consistently applied set of management, constructive, and operational practices that support the addition of new and upgraded systems to a growing interoperability of the System of System (SoS). Improvements in technology alone (whether XML or any other) will not be sufficient. There must be parallel improvements in the ways that current and future interoperability needs are identified, and how organizations pursue interoperability. In an effort to define and derive interoperability within System of System, we shall explain the overarching System of System engineering approach and the interoperability issues that may arise within the project and within the organization.

**Biography:** Mrs. Mahasa Zahirnia is Product Owner at Northrop Grumman Corporation, a premier engineering firm for Department of Defense. Mrs. Zahirnia has over 27 years of experience in the areas of Program Management, Electrical Engineering, Control Systems, Cyber Security, System Engineering and Architecture. She is a Chairwoman of the Society of Women Engineers, a member of the Institute of Electrical and Electronics Engineers, and has coached several Robotics Programs for local middle schools. Mrs. Zahirnia has received several awards from the Department of Defense for her outstanding performance in the area of engineering and has mentored several at risk young students. She received a Bachelor's of Science degree in electrical engineering from San Diego State University and a Master's degree in Management from University of San Diego. Mrs. Zahirnia has held positions at Northrop Grumman, Booz Allen Hamilton, Cubic Cooperation, Captiva Software, Sony Corp and Solar Turbines.

**Speaker:** Mr. Deric Merino, Jama Software

**Topic:** [ALM Interoperability: Past, Present, Future](#)

**Abstract:** Connecting enterprise and ALM tool platforms can be difficult, often very difficult. To understand how it became such a challenge, we must understand how we got here. Then we need to understand how vendor companies are trying to solve the problem today, and what do they see as the future. In this presentation we will look at how Systems Engineering tool sets have evolved and how new vendor players are connecting data on both legacy and future systems.

**Biography:** Deric Merino has spent the past 20 years of his career in high technology as a software & systems engineer & product marketing specialist. In his current role with Jama Software he is responsible for commercial business development and sales in North America. He holds professional certifications / degrees in Electrical Engineering, Enterprise Architecture & Finance and is a certified Scrum Master.

**Panel Discussions - Speakers:** Mr. Richard Bryson, Mr. Howen Fernando, Ms. Mahasa Zahirnia, Mr. Deric Merino

**Moderator:** Abbas Rostami

**Abstract:** This is an open forum to exchange information and discuss interoperability related questions form the moderator and audience.