INCOSE

Members NEWSLETTER

Q3 / SEPTEMBER 2024

The International Council on Systems Engineering

Introduction

International Symposium 2024

Chapter Updates

Working Groups & Initiatives Updates

Community Updates and Interests

Services, Products & Publications

A MESSAGE FROM THE INCOSE PRESIDENT

Dear INCOSE Members Worldwide,

The last quarter was marked by the energy and excitement surrounding the outstanding International Symposium (IS) in Dublin. Following last year's success in Honolulu, this event further solidified our IS as the premier annual Systems Engineering event, confirming its key role within the global SE community. In this newsletter, you'll find several inspiring symposium testimonials that we hope will motivate you to join us for another successful event in Ottawa next year.

One of the major highlights for me was the opportunity to unveil our brand-new strategic plan, approved by the board just before the IS. In this newsletter, you'll find an in-depth article outlining this plan, which has already been shared with the global INCOSE leadership. We look forward to continuing the conversation and exploring new opportunities at our upcoming local and regional events. I can confidently say that the scope and focus of our strategy are already having a positive impact on decision-making and will guide the preparation of our 2025 annual operating plan, fully aligned with our strategic goals.

Additionally, I'm pleased to report on our sustained global growth, which is highlighted across several articles. To mention just a few examples, I was honored to participate in August at the inaugural Thailand SE Conference, organized by the exceptional interim leadership team there. We look forward to welcoming Thailand as a new member of our Asia Oceania Sector soon. This year also marks the 30th anniversaries of SESA (our Australian chapter) and our UK chapter, which has now been officially recognized as the Institute of SE (IfSE) in the UK.

Our continuous commitment to enhancing our products and services is exemplified by the growth of the Systems Engineering Laboratory, which now includes a range of tools used by over 300 members. This benefit facilitates collaboration within our working groups and initiatives through a cutting-edge computing environment.

Lastly, I encourage you to mark your calendars and make plans to attend our Annual International Workshop in Seville, Spain, from February 1 to 4, 2025. This will be an excellent opportunity to embrace our "One INCOSE" mindset and collaborate with global and national working groups toward our shared objectives.

Ralf Hartmann

"The scope and focus of our strategy are already having a positive impact on decision-making and will guide the preparation of our 2025 annual operating plan, fully aligned with our strategic goals."

A MESSAGE FROM THE EXECUTIVE DIRECTOR

To all INCOSE members,

2024 has been a year of transition and planning for INCOSE. We have introduced a new vision and mission, a new strategic plan, and have been building a sustainable infrastructure to support the organization for generations to come. Through this process, we spent a lot of time reviewing and considering the core values of INCOSE and the principles by which we operate. Core to these values are things that should never change, like systems thinking, lifelong learning and professional development, impact, and volunteerism. And while we did not change our core values, there are principles by which we operate, or should operate, as an organization.

One of these items is sustainability. As we build a sustainable infrastructure, we are also taking a hard look at all of our operations with a sustainability lens. When we really looked, we found 2 initial areas where INCOSE could be more sustainability-conscious and align our operations with principles that drive SE.

The first and largest area we are taking action on is travel. We all understand the impact of global travel, especially air travel, on CO2 emissions and climate. INCOSE has plenty of sponsored travel, and as a global organization, air travel is a necessity for conducting much of our business. To address INCOSE's travel and our impact, we are doing two things:

1. We have partnered with Native, a Public Benefit Corporation and certified B Corp. For almost 25 years, Native has worked to fund new projects that help reduce greenhouse gas pollution while addressing other environmental issues like clean water access, improving agriculture practices, providing efficient cookstoves, and supporting renewable energy. Through Native, INCOSE is offsetting 1,000,000 miles of air travel emissions.

2. We are being more deliberate and conscious of the travel we approve. We will continue to travel, but we are being more critical about when, who, how many, and from where travel occurs. For example, in the past, INCOSE may have funded 3 or 4 volunteers to attend the same meeting to represent INCOSE. We are now considerate of the fact that one person may likely be able to effectively represent INCOSE at this meeting in the future. We are also considering geography. If we have two people able to represent INCOSE at a meeting in Europe, we will prioritize the person in Europe to attend versus someone from North

Back To Table of Content

America.

The second area we are taking action on is our event production. Many of you attend and find great value in the International Symposium, International Workshop, or our regional meetings. Moving forward, we are going to be diligent in applying sustainable practices to our event production. There are small things that can make a large impact, like eliminating the printing of event guides (especially as we have moved to digital apps for our events) and working with our venues to eliminate single-serve paper coffee cups in favor of mugs. Some of these changes in our event production may be noticeable, but many will not be. Considering our events greatly impact sustainability, we must take steps.

We know you join INCOSE for many different reasons. We take providing value to you and your companies seriously, and we aim to continue to challenge ourselves to be better in all ways so you and future generations of SEs take pride in INCOSE.

Steve Records

Back To Table of Content

INCOSE STRATEGIC PLAN

Our vision is to unite and advance the global systems community

INCOSE fosters systems engineering research, education, application, and knowledge exchange. We are dedicated to being the world's trusted authority and forum for the science, art, and practice of systems engineering.

Advance systems engineering as the world's trusted authority.

Expand the systems engineering community while growing INCOSE.

Foster professional development and systems engineering competencies.

Achieve operational excellence.






EDITOR-IN-CHIEF'S LETTER: EMBRACING CHANGE, DRIVING FORWARD

Dear INCOSE Members,

It is with great excitement that I welcome you to the newly redesigned INCOSE Members Newsletter. This refreshed look aligns with INCOSE's renewed vision and mission, as outlined in our Strategic Plan, and reflects our dedication to advancing the field of systems engineering through innovation, excellence, and collaboration. Our goal with this redesign is to create a publication that not only informs but also inspires, as we move forward together on this journey toward a brighter future for our profession.

In this edition, you will find updates from the Board, including a detailed article on our new Strategic Plan from David Long, which outlines the plan, guided by our four strategic pillars—empowerment, engagement, operational excellence, and impact—aims to strengthen our community and expand our influence globally. Additionally, we are approaching an important moment for INCOSE with the 2024 Board of Directors elections for Secretary and Americas Sector Director. Your participation in these elections is vital as we shape the future leadership of our society.

We are also excited to share highlights from the 2024 International Symposium, which showcased the vibrant achievements and aspirations of our community. Inside, you'll find an overview and a photo collage capturing the event's highlights, along with an introspective piece by Victoria Patterson, reflecting on the insights and connections made at the symposium.

Our chapters continue to be a driving force within INCOSE, fostering local engagement and global impact. This issue features stories from around the world, including the celebration of SESA's 30-year anniversary, JCOSE's new Automotive Working Group, and the collaboration between UFMG and INCOSE Brasil on developing a Systems Engineering Certificate Program. You'll also read about the North Texas Chapter's SEP Certification Prep Course, a unique stadium tour from a systems perspective hosted by the Washington Metro Area Chapter, and a Model-Based Systems Engineering Workshop in collaboration with MathWorks, organized by the New England Chapter. Whether it's a community picnic by the Colorado Front Range Chapter or the fresh initiatives from GfSE and INCOSE UK, our chapters are at the heart of our mission to connect, engage, and advance systems engineering.

Our working groups and initiatives continue to push boundaries and address some of today's most pressing challenges. In this edition, you'll learn about the Systems Security Engineering Working Group's call for articles for the August 2025 INSIGHT issue, and the ongoing efforts of the SmartCities Initiative to tackle homelessness in San Diego. These efforts reflect the incredible breadth and depth of work being driven by our dedicated members.

As we embrace this new chapter, this redesigned newsletter is more than just a change in appearance—it is a reflection of our ongoing commitment to excellence, growth, and positive change. I am deeply grateful for your dedication and engagement, and I look forward to continuing this journey together as we advance the art and practice of systems engineering. Thank you for being a vital part of INCOSE. Let's move forward with optimism and determination, building a stronger future for osur profession and the world.

With best regards,

Honor Lind

Director of Marketing and Communications

Special Thank You


It's my pleasure to recognize and extend heartfelt thanks to Kelly Henseler and Anthony Abi Badra for their outstanding contributions to the new INCOSE Members Newsletter!

Anthony, your creative flair and modern design approach have truly brought our vision of a magazine-style newsletter to life, perfectly reflecting the fresh, contemporary direction of INCOSE. Kelly, your exceptional editing skills and dedication have been invaluable in unifying our global network and ensuring the highest standards of quality and integrity shine through.

Working with both of you to support our global community has been a rewarding experience, and I deeply appreciate the professionalism and passion you each bring to this project!

Back To Table of Content

FROM DEVELOPMENT TO ADOPTION TO EXECUTION: INCOSE'S STRATEGIC PLAN

By David Long, Director for Strategy, david.long@incose.net

The journey to develop a strategic plan focuses on where we want to go (our vision, mission, and objectives) and how we choose to get there (our supporting strategies). Even more important is ensuring that the strategic plan embodies our principles, values, and approaches – in the plan itself, the development of the plan, and its execution.

As INCOSE developed our new strategic plan over the last fifteen months, we emphasized engagement throughout – from a global leadership SWOT analysis to a member engagement survey to open sessions and reviews. We built upon the fundamental systems engineering principle that the power of multiple perspectives and our collective intelligence see further than any one individual. Perhaps most importantly, while the four strategic objectives may be timeless for a professional body, how we frame them and how we pursue them reflects who we are as a community. As INCOSE strives to unite and advance the global systems community in pursuit of a better world through a systems approach, we do so in a holistic, collaborative manner advancing the discipline, expanding the community, serving our members, and doing so with excellence.

With the formal adoption of the vision, mission, objectives, and strategies in June, we now transition to a new phase.

The strategic plan is a framework to help us align and focus our energies rather than a script to direct our efforts. While the strategic plan is set, the conversations continue as we work together to define, evaluate, and refine our tactics in pursuit of our objectives. We are doing this today across INCOSE as we set targets, prioritize initiatives, and define our plans for 2025.

Engagement has been critical as we collectively crafted our strategic plan. However you choose to engage with INCOSE – in working groups, with your local chapter, or at the international level – I hope you will continue that engagement as we translate the plan into action. Aligning our efforts together, we will create the future of INCOSE, our greater community, the discipline of systems engineering, and a better tomorrow!

"Aligning our efforts together, we will create the future of INCOSE, our greater community, the discipline of systems engineering, and a better tomorrow!"

PLATINUM SPONSOR SPOTLIGHT: **DASSAULT SYSTÈMES**

INCOSE is proud to recognize Dassault Systèmes as our valued Platinum Sponsor. Their unwavering support plays a crucial role in advancing the global systems engineering community and empowering our key initiatives.

From career development opportunities through the Career Hub and Virtual Job Fair, to the knowledge-sharing Webinar Series, Dassault Systèmes' partnership helps shape the future of systems engineering.

We extend our deepest appreciation to Dassault Systèmes for their continued commitment to our mission. Together, we are building a stronger, more connected systems community.

To learn more about Dassault Systèmes and their innovative contributions, visit www.3ds.com.

Back To Table of Content

INCOSE INTERNATIONAL SYMPOSIUM 2024 (IS2024)

A Dublin Delight

The 2024 INCOSE International Symposium was a resounding success, bringing together over 1,000 systems engineering professionals from around the globe to the vibrant city of Dublin, Ireland. The event showcased the latest advancements in the field through a robust technical program featuring 100 papers spread across six different technical tracks.

In addition to the technical presentations, attendees had the opportunity to participate in seven engaging panel discussions covering a wide range of topics like participatory methods in systems engineering, teaching systems engineering, and smart cities. These sessions fostered lively debates and provided valuable insights into emerging trends and challenges in systems engineering.

Back To Table of Content

The keynote speakers attracted an attentive audience each morning, featuring presentations by notable industry leaders, including Professor Brian Collins, Mark Kelly, and Dave Snowden.

We extend our sincere thanks to the organizers, speakers, panelists, presenters, and attendees for making this year's symposium an unforgettable experience.

Award Recipients

Congratulations to the outstanding individuals and teams recognized with awards at the symposium! Your exceptional contributions to the field of systems engineering are an inspiration to us all.
These awards highlight the incredible talent and dedication within our community. Your achievements drive innovation and advance the practice of systems engineering worldwide. We are proud to be part of such a dynamic and forward-thinking community.

The following is a list of the 2024 IS Award Recipients:

Best Papers

- “Systems Engineering roles to handle emergent properties and behaviors in complex technical systems” By Jan Pfeifer, Iris

Graessler, Florian Hintz, and Nicolas Meyrl
- "Human Frailties: Springboard to Increased Systems Engineering Influence" By Dorothy McKinney and Eileen Arnold
- "Towards a Systems Engineering Ontology Stack" By Joe Gregory and Alejandro Salado
- "Systems-Theoretic Concept Design: An Intent Model for Early Concept Generation" By Alexander Hillman, Nancy Leveson and William Young
- "AI Systems Modeling Enhancer (AI-SME): Initial Investigations into a ChaptGPT-enabled MBSE Modeling Assistant" By Brian Johns, Kristina Carroll, Casey Medina, Rae Lewark and James Walliser

Brian Mar Best Student Paper

- "Integrating SPA Extended for Coordination into SysML Using RAAML Methodology" By Elizabeth Pennington

INCOSE Fellows

- G. Maarten Bonnema
- Anja Maier
- Ramakrishna "Ramki" Raman

INCOSE Founders

- Terry Bahil
- Kerry Lunney

International Science and Engineering Fair (ISEF) Awards

- First Place Best Use of Systems Engineering: Robin Chris Dao
- Second Place Best Use of Systems Engineering: Jeslyn Gabrielle Tan
- Bill Ewald Socio-Technical Systems Engineering Award: Diana Martynova

Chapter Circle Awards

- Platinum: Italy Chapter, Los Angeles Chapter, San Diego Chapter
- Gold: North Texas Chapter, Washington Metro Chapter
- Silver: Canada Chapter, Chesapeake Chapter, Chicagoland Chapter, Cleveland Northern Ohio Chapter, Finger Lake Chapter, Michigan Chapter, Seattle Metro Chapter, Southern Maryland Chapter, Spain Chapter
- Bronze: Midwest Gateway Chapter, North Star Chapter
- Outstanding Chapter Circle Award: San Diego Chapter
- Most Improved Chapter Circle Award: North Texas Chapter
- Good Neighbor Chapter Circle Award: India Chapter

SE Journal Awards

- Outstanding Paper: "Conceptual modelling to supports the system level decision making: An industrial case study from the Norwegian energy domain" by Siv Engen, Gerrit Muller, and Kristin Falk
- Reviewer of the Year: Ryan A. Noguchi

On to Ottawa

The INCOSE Events and Technical Program Committees are already hard at work preparing for IS2025 in Ottawa, Canada! The event will take place July 26 – 31, 2025, at The Shaw Center.

We hope to see you there!

Back To Table of Content

AN INTROSPECTIVE OF THE 2024 INTERNATIONAL SYMPOSIUM: AN UNFORGETTABLE LEARNING OPPORTUNITY OF THE IMPACT OF ADVOCACY

By Victoria Patterson, Systems Engineer, Northrop Grumman, Space Systems, INCOSE-LA 2024 Secretary and EWLSE Co-Chair Americas Sector

Sometimes I scare people with my enthusiasm for engaging with strangers and for my resiliency. When I received all three approvals that I needed to attend the 2024 INCOSE's International Symposium, my palms were sweaty, and my heart was racing. I was ecstatic to have this opportunity to attend an event that happens once a year where over a thousand brilliant and intelligent individuals from all around the world come together to learn, to share, to connect, to reconnect, and most importantly, to hold intriguing dialogs and in-depth discussions on future engineering and societal challenges we aim to overcome.

I not only needed to be a self-advocate for myself, but also realized the importance of doing so for others. As it was getting closer to the conference, my excitement suddenly turned into a nauseous feeling in the root of my stomach. I was about to step outside of my comfort zone in many ways all at once. I have spoken in front of large crowds before; however, this trip was going to be different; it was going to be my first time flying outside of my country and speaking in front of INCOSE's diverse audience of well-respected and experienced system engineers. The irony was that the subject centered on the importance of understanding the intricate and complex nature of the relationships that organizational culture has in the development and success of systems engineer leaders, which is a subject that I am *still* learning so much about with each interaction.

This panel taught me the importance of restoring our energy individually, so that we can accomplish our goals collectively. This year was especially challenging to obtain the resources required for travel, let alone international travel. My involvement and association with my local INCOSE chapter, the larger community of INCOSE, and home organization was the catalyst in my pursuit of accomplishing my goal of speaking internationally at a Systems Engineering Conference. Throughout the session, I was hyper-engaged and present, so much so that I almost forgot about how hot the stage lights were beaming down at us. We had several in-person questions and discussions with the audience members that made a lasting impression on me, which would not have happened otherwise. It was truly an unforgettable experience, especially because this hybrid event was held in the lively and majestic yet quaint cobblestone streets of Dublin, Ireland, in Europe.

I found myself far away from home and my comfort zone, yet feeling like I belonged and I was right where I was supposed to be, thanks to the leaders in INCOSE's Empowering Women Leaders in Systems Engineering Initiative (EWLSE) Group, Dr. Alice Squires, Javier Calvo-Amodio, Anabel Fraga, and Stueti Gupta, as well as, my supportive local INCOSE chapter. I would also like to thank my home organization for advocating for me.

Back To Table of Content

SYSTEMS ENGINEERING SOCIETY OF AUSTRALIA CELEBRATES 30 YEARS

By Beth E. Concepción

Dec. 2 this year will mark the 30th anniverscnt meeting in the history of the Australia chapter of INCOSE. Hervé Rochecouste, who had an interest in formalizing Systems Engineering as a discipline in its own right, invited technical directors, engineering managers, senior officers and professors from various technology organizations to meet at the Rex Hotel in Canberra.

“In those days, we used an old communications method called ‘fax,’” Rochecouste said. “They all responded and turned up. The challenge was set in motion with a massive push.”

The challenge was to create a professional society dedicated to systems engineering – an idea Rochecouste first conceptualized on the back of a Qantas boarding pass while flying back to Australia from Los Angeles after presenting at the NCOSE Symposium in San José in July 1994. The Australian contingent present met for dinner in a Mexican restaurant and agreed that it would be a good thing if more was done on systems engineering in Australia.

This meeting led to the formation of the Systems Engineering Society of Australia – a new technical society within Engineers Australia. It was the first international chapter of the newly expanded INCOSE, having just made the shift from NCOSE. (Fun fact: Rochecouste was the one who pushed to get the NCOSE name changed to include international representation.)

By the end of its first official year, SESA had 206 members.

Rochecouste was the inaugural president of SESA and Dr. Ross Sydney was the inaugural industry advisor.

Rochecouste and Sydney worked together for Rockwell Australia on the F-111 Avionics Upgrade Project. Both had worked on large-scale defense projects – Rochecouste at Thomson CSF (now Thales) and Sydney through the Army and with (then) Defence Materiel Organisation (DMO). They saw that large-scale projects were becoming increasingly complex, requiring the integration of components from multiple companies.

“We had excellent interest from several large engineering organizations in Australia, such as Telstra, Boeing, Department of Defence, University of Technology Sydney, British Aerospace, Department of Civil Aviation, Thales, Royal Melbourne Institute of Technology,” Rochecouste said. “It was evident that there was a lot of early momentum to carry SESA a long way, and for many years to come. We created the highest possible visibility in industry, government and academia.”

Rochecouste gives plenty of credit to two key SESA founding members: Kerry Lunney, who served as the NSW SESA chapter president in 1995, SESA president 2008-09, and INCOSE president from 2020-22; and Roger McCowan, who served as newsletter editor for many years and as SESA president 2001-03 and 2009-10.

Back To Table of Content

(Left to right) Dr. Ross Sydney, Hervé Rochecouste and Thomas Manley met up recently in Canberra to talk about SESA’s founding.

“The SESA achievements over the years would not have been at all possible without Roger and Kerry supporting me from Day One in 1994 and for many years thereafter,” Rochecouste said. “I thank everyone who contributed in the past, those working today, and those who will keep SESA going for the many years to come.”

“It would be interesting, if it were possible, to quantify the effect that the adoption of systems engineering (and hence SESA) has had to the Australian economy,” said Thomas Manley, co-chair of the INCOSE Information Communications Technology working group. “Whatever the impact, it is the result of the efforts of organizations such as SESA, INCOSE and Engineers Australia, and the individuals within who so often go unheard of (and un-thanked).”

Rochecouste reflected that he would like to be known for this push for cooperation and visibility.

“I would like my legacy to be one of the first few who identified that there was a need for all concerned organizations to work together toward the development of a new discipline to support and normalize what we had started to do,” he said. “A mutually beneficial set of cross technological rules, terminology and processes. That task required people to get together, talk, decide, try, improve and define.”

That is a goal that INCOSE is continuing to work on today.

JCOSE UPDATE

By Midori Daida

Latest Updates from IS2024 & SEP Certification Overview

On August 3, 2024, JCOSE hosted an online seminar titled "Latest Updates from INCOSE International Symposium 2024 & SEP Certification Overview." This seminar provided the latest insights from the INCOSE International Symposium 2024 (IS2024) held in Dublin, with participants who attended IS2024 highlighting notable sessions on FuSE (Future of Systems Engineering), MBSE, STPA, and UAF. Professor Hidekazu Nishimura also shared his reflections on attending the symposium, offering valuable perspectives on the latest trends in systems engineering, including MBSE and UAF.

In addition to the symposium updates, the seminar provided detailed information on the INCOSE Systems Engineering Professional (SEP) certification. The session covered various aspects of the SEP certification, including the different types of certifications available and the application process. SEP holders also shared their personal experiences and offered valuable advice to those considering pursuing the certification.

Book Launch Event for Japanese Translation of SE Books

On June 15, 2024, JCOSE held an online joint book launch event to introduce the Japanese translations of two systems engineering books: "Systems Engineering Demystified" by Jon Holt and "Don't Panic! – The Absolute Beginners Guide to SysMLv2" by Tim Weilkiens and Christian Muggeo. The event featured presentations by the authors, who joined the event online to discuss their work. This event was organized by Yutaro Ito, a JCOSE committee member and one of the translators of the books. His efforts ensured that Japanese systems engineers had a valuable opportunity to deepen their understanding of these critical texts and interact with the authors.

JCOSE Automotive WG

JCOSE has established the JCOSE Automotive Working Group and held a kick-off meeting on July 30, 2024. The mission of the JCOSE Automotive WG is to promote systems engineering within the automotive industry and to enhance the industry's development capabilities. The vision is to respect the philosophies and processes of the automotive sector while addressing challenges based on systems engineering principles.
Moving forward, the JCOSE Automotive WG will explore issues related to systems engineering in the automotive field and form sub-working groups to address these challenges.

Back To Table of Content

HSI2024: THE 3RD INCOSE INTERNATIONAL CONFERENCE ON HUMAN SYSTEMS INTEGRATION JOINTLY ORGANIZED WITH IEA 2024: THE 22ND TRIENNIAL CONGRESS OF THE INTERNATIONAL ERGONOMICS ASSOCIATION (IEA)

By Prof. Guy André Boy, Ph.D., Chair of INCOSE HSI Working Group and Ambassador for the IEA-INCOSE MOU

HSI2024, the 3rd INCOSE International Conference on Human Systems Integration, was held in Jeju, Korea, jointly with IEA2024, the 22nd Triennial Congress of the International Ergonomics Association (IEA), on August 27-29, 2024. It was a big success.

This event is a response to the objectives of the Memorandum of Understanding between INCOSE and the IEA. HSI2024 was organized as a common effort between IEA and the INCOSE Human Systems Integration (HSI) Working Group (WG) and advertised as such (https://www.iea2024.com & https://www.flextechchair.org/HSI2024/event-schedule-1.html).

This first jointly organized event gathered more than 1600 participants from 80 countries. That is to say that HSI now has a very large exposure worldwide. INCOSE and IEA have highlighted our growing discipline within a welcoming ecosystem. Around 200 participants attended the HSI2024 reception in a magnificent setting overlooking the ocean. Besides the remarkable presentations, this joint event facilitated exchanges between systems engineers and human factors specialists toward a common understanding of HSI.

Three keynotes were given: Dr. Guy A. Boy talked about the evolution of HSI as a growing discipline that has become necessary in engineering and our workplace ecosystem. He provided a vision for HSI through socio-ergonomics and human-AI integration. Dr. Cynthia Null (NASA Ames Research Center, USA) presented NASA's view of HSI. Dr. Ayse P. Gurses (Johns Hopkins University, USA) addressed the topic of human systems integration across the Health Care Continuum and gave examples, opportunities, and the future.

HSI papers presented a variety of fundamental assets that cannot be avoided anymore, such as complexity analysis and the issue of emergence, organization design and management, the account of context, human-AI teaming, and people's experience. Let's take a few significant examples:

Human-AI teaming was addressed many times. Generative AI (GenAI) can provide clues and assist in accident investigations, for example, but cannot replace human judgment. As said, what GenAI will provide depends on inputs.

For example, complex inputs such as Aviation Safety Reporting System data may not always be complete and accurate. So, How can we trust GenAI outputs that result from partially complete and inaccurate data? Therefore, if humans must interpret such partially incomplete and inaccurate data (inputs and outputs), don't we already solve problems without AI? This is precisely an HSI problem that needs to be addressed. In any case, a systemic approach to GenAI must be adopted. Maturity should be measured. More generally, it came out from all AI-based presentations that AI is a tool that assists people and does not replace people.

The concept of context has been covered. Any sociotechnical system cannot be understood, designed, and assessed without considering contextual conditions. Several situations can be considered, such as how the system is designed (design context) or operated (operational context). The notion of "situation" is multiple. HSI is therefore interested in context acquisition, system contextualization, human-in-the-loop simulation, and situated system design. More has to be investigated in the context field, specifically context modeling.

Automation is also a major issue for HSI, whether AI is used or not. It is a matter of delegating tasks previously executed by people to the machine. Trust and collaboration are key issues that must be analyzed regarding human and machine cognitive functions depending on the complexity involved. Most HSI methods require human-in-the-loop simulations during the whole life cycle of the sociotechnical system being considered. Scenario-based design methods are promoted. This is related to context modeling articulated with system architecture design approaches. HSI automation research and development deals with risk and resilience analysis, especially in unexpected events and emergencies. Manual reversion remains a key issue.

HSI ontology development has been discussed to increase appropriate common language among IEA and INCOSE HSI scientists and practitioners. The maturity of the HSI field will be measured based on this common HSI ontology. Several means

A photo of the participants to an HSI2024 session

can be developed to support this maturity assessment, including webinars, workshops, projects, and other appropriate forums. In addition, HSI ontology will support HSI standardization. We will expand participation in this work to other organizations, such as ACM and ISO.

A large emphasis has been placed on sociotechnical systems and, more specifically, on organizational aspects of them. Concepts of operations (ConOps) were mentioned as key requirements for modeling organizations, seen as systems. Can we plan and measure organizational change to ensure we are maturing at a pace similar to technology? Human readiness levels (HRL) should map Technology and human readiness levels (TRL). Organizational readiness levels (ORL) are starting to be used in several industrial sectors. Organizational change depends on the socio-economical framework type, whether based on short-term predictions or longer-term anticipation.
Designing and developing a new life-critical sociotechnical system involves soft skills to make efficient decisions in large teams. The human and machine roles of an operations team must be correctly defined. This raises areas of future interest, such as different operations maturity, different contexts of operations, human-machine teaming systems, and advanced teaming tools. This was illustrated by an ethnographic study of the Mars 2020 design and development process. What effectively emerged is the need for human-in-the-loop simulations during design. One of the outcomes was the need for intersubjectivity (i.e., interoperable language) among co-workers, namely between engineers and scientists.

This conference was co-organized by the HSI WG and people from IEA. Thanks to Grace Kennedy, So Young Kim, Dimitri Masson, and Michelle Robertson. Thanks also to the program committee members (https://www.flextechchair.org/HSI2024/program-committee.html) and the participants who presented excellent contributions. Other executive people, such as Kerry Lunney, Katheleen Mosier, and José Orlando Gomes, should be recognized for their active support in developing HSI.

The success of the HSI2024 conference consolidated the IEA-INCOSE MOU. Several actions have been proposed: organizing workshops, webinars, tutorials, and online meetings, as well as creating an IEA HSI Technical Committee. A first online IEA-INCOSE HSI meeting will be held within the next few months to support the coordination of a joint program. IEA members are invited to participate in the HSI Primer development meetings. We will also work together to set up the next HSI2027 conference, to be held in London, UK, in cooperation with the IEA 2027 World Congress.

Finally, I want to use this metaphor of building a house, that is, HSI, where IEA and INCOSE contributors could live together, with two windows, one open on the IEA landscape and the other on the INCOSE landscape. Of course, more contributors, windows, and landscapes could be added, such as ACM-SIGCHI to reinforce the digital component.

Back To Table of Content

UFMG AND INCOSE BRASIL COLLABORATION FOR SYSTEMS ENGINEERING CERTIFICATE PROGRAM DEVELOPMENT

By Bruno Soares, Director of Communications of INCOSE Brasil

On July 16th, Federal University of Minas Gerais (UFMG) System Engineering professors (André Costa Batista, Ana Liddy and Ricardo Luiz da Silva Adriano), representatives of the INCOSE Foundation (Dorothy Benveniste, Larry Strawser, Regina Grieco) and INCOSE Brasil members (Marcia Platilha, Raquel Hoffman) met virtually for the first follow-up meeting to evaluate the progress of the UFMG action plan to develop a systems engineering certificate course that should qualify students for INCOSE certification under Systems Engineering Professional (SEP) academic equivalency.

In the first quarter, UFMG professors evaluated the undergrad syllabus in comparison to the Systems Engineering Handbook V5 knowledge and learning objectives. Professors and students were also able to register as Corporate Advisory Board (CAB) associates and access available CAB resources.

Also, communication actions were taken to spread the word about UFMG CAB membership, including a podcast episode with Professor Ana Liddy hosted by INCOSE Brasil.

In the following quarter, UFMG professors will develop the first version of the syllabus and schedule for the certificate SE course (ASEP AcEq) and its business model structure.

INCOSE NORTH TEXAS CHAPTER PARTNERS FOR SEP CERTIFICATION PREP COURSE

By Teresa Whitaker, Long Dong, Dawn Handley

The North Texas INCOSE Chapter, Southern Methodist University (SMU), and Lockheed Martin Aeronautics have partnered over the past two years to offer an INCOSE Certification Exam Prep Course open to all INCOSE members or CAB associates. This course is designed to support engineering professionals interested in obtaining an INCOSE Associate Systems Engineering Professional (ASEP) or Certified Systems Engineering Professional (CSEP) Certification. Course instructors have a wide breadth of Systems Engineering technical knowledge across the system lifecycle and work at a variety of companies that include Lockheed Martin, Raytheon, SNC, Collins Aerospace, and more than one adjunct professor from the University of Texas at El Paso (UTEP), just to name a few. The INCOSE Certification Exam Prep Course is offered twice a week, usually from June to August of each year.

The North Texas INCOSE Chapter, Southern Methodist University, and Lockheed Martin Aeronautics have also partnered to schedule two INCOSE paper exams this fall on September 14th and October 18th from 8:00 A.M. to 12:00 P.M. Central at Junkins Hall, SMU, in Dallas, Texas. The exam is limited to thirty people, costs thirty dollars, and individuals can register through INCOSE.org.

Southern Methodist University recently became a CAB Member and is a huge supporter of INCOSE. It was the first University in Texas to offer academic equivalency in lieu of the Systems Engineering Professional exam for students who meet the requirements.

Since offering the INCOSE Certification Exam Prep Course, the INCOSE North Texas Chapter has seen a 37% increase in certified Systems Engineering Professionals in the past year.

The INCOSE North Texas Chapter expanded its training in 2023 to include an MBSE six-hour tutorial offered by StudioSE and plans to offer a similar Systems Engineering tutorial in 2024 to help members expand their systems engineering knowledge and obtain their OMG Certification.

Photo: INCOSE North Texas Chapter members at the 2024 MBSE Cyber Symposium in Dallas, TX

INCOSE IN THE BALLPARK: STADIUM TOUR FROM A SYSTEMS VIEW

By Kathleen Flynn, INCOSE WMA Event Coordinator

On Sunday, June 23rd, INCOSE Washington Metro Area (WMA) participated in an engaging chapter membership event at Nationals Ballpark in Washington, DC. Chapter members were given the opportunity to take an exclusive behind-the-scenes tour of the stadium. This in-depth guided tour provided an insightful look into the infrastructure that supports our local Major League Baseball team.

Members were given a comprehensive overview of the ballpark's history and significance in the Washington, DC area. In 2005, major league baseball returned to Washington, DC, after a 33-year absence from the city. Located in Southeast Washington, the park is a 41,546-seat venue. The ballpark was the first major league stadium in the United States to be accredited as a Leadership in Energy and Environmental Design (LEED) structure. The ballpark's design and construction have now exceeded the target of a certified "Green" building and have received the United States Green Building Council's "Silver" status.

Tour participants had a chance to learn about the history of baseball teams in the Washington metro area, including the Washington Senators and the Homestead Grays. There were many opportunities to view fascinating historical team memorabilia, such as the 2019 World Series trophy and team artifacts from the championship series. Two wonderful park tour guides, Philip and Dennis, provided a comprehensive overview of stadium history and design.

The tour allowed INCOSE members to explore various areas of the stadium, including the Nationals team dugout and bullpen, the visiting team clubhouse, the media press box, the press conference room, luxury suites, and the club level. Members enjoyed learning about the advanced systems that support the venue's functionality, such as a brand-new high-definition scoreboard, as well as the beverage distribution system for beer sold at the stadium (very important!). It was also interesting to learn about the locally-sourced materials used to construct much of the stadium, such as the bluestone backstop behind home plate. From experiencing the highest-elevation media press box in Major League Baseball to exploring the stadium's underground tunnels, the chapter truly had an immersive experience at the park. Chapter members even had a chance to step foot on the field and try their hand at pitching baseballs in the bullpen!

INCOSE members sit inside the Shirley Povich Media Center, viewing the ballpark from the tallest press box in major league baseball.

This chapter event was a great opportunity to connect with fellow systems engineers while enjoying a fascinating tour of a local baseball stadium. In-person membership events provide opportunities for connection and continuous learning within INCOSE, and taking a tour of the complex system-of-systems that is Nationals Ballpark allowed chapter members to appreciate the sport of baseball from a systems view.

Back To Table of Content

MODEL-BASED SYSTEMS ENGINEERING WORKSHOP AND NETWORKING WITH MATHWORKS ENGINEERING TEAM

By Becky Petteys, Brian Sheehan, and Michael Tymm

On May 15, INCOSE New England members had an opportunity to try out System Composer during a hands-on MBSE workshop hosted in collaboration with MathWorks at its development headquarters in Natick, Mass. Participants engaged in a series of interactive, practical exercises to familiarize themselves with the tool and had an opportunity to share feedback with the team responsible for evolving the product.

The workshop was led by Becky Petteys, who joined MathWorks in 2005 to work with customers doing systems engineering and model verification and validation. Prior to that, Becky worked for a government contractor doing stability and controllability analysis of launch vehicles for government satellite launches. The session was designed to cater to both newcomers and seasoned users of MBSE tools.

One of the highlights of the workshop was the advanced demonstrations that showcased the power of activity and sequence diagrams. These live demos illustrated the capabilities of System Composer in a real-world context, leaving participants impressed by its potential to streamline and enhance their engineering processes.

Another key feature of the workshop was the deep dive into SysML v2 constructs. Attendees discovered how these constructs are integrated into System Composer and learned about the enhanced model interchange capabilities supported by the SysML v2 API. This session offered critical insights into the future of MBSE and the evolving landscape of systems engineering.

The event concluded with a social hour, providing a valuable networking opportunity for participants. Over light refreshments, attendees had the chance to share their insights, discuss their experiences, and connect with the System Composer development team.

Overall, the Model-Based Systems Engineering workshop with MathWorks was a solid success. Other INCOSE chapter leaders should consider hosting similar workshops and reach out Becky Petteys (bpetteys@mathworks.com) to coordinate. Members may also wish to explore MathWorks System Composer Onramp for a self-serve hands-on look at this product, available at no charge.

Back To Table of Content

INCOSE LOS ANGELES CHAPTER UPDATE

By Fred Lawler and Karel Marshall

SEP Certification Cohort

In June, INCOSE Los Angeles & San Diego concluded another joint 10-week SEP Certification Cohort. Before taking the test (including at the IS in Dublin), 29 members covered the following topics:

- System Life Cycle Concepts, Models, Processes
- Life cycle terms concepts through Supply Process
- Organizational Project Enabling Processes
- Technical Processes and Management
- Life cycle analysis methods
- Quality characteristics and approaches
- SE analyses and methods
- Product Line Engineering
- Tailoring and Application Considerations
- Systems Engineering in Practice

11th Annual MARS Expo

The INCOSE-LA Chapter is co-sponsoring the 11th Annual Mars Updates & Professional Society Expo, being held on the Loyola Marymount University (LMU) Campus (Westchester, CA, just North of LAX) on Saturday, Sept 21, 2024 from 1-5pm Pacific Daylight Time.

This annual Premier Science Technology Engineering and Mathematics (STEM) & Young Professional (YP) Outreach Event will feature numerous STEM & YP exhibitors from the Los Angeles and Orange County areas. Many local societies will showcase their STEM-related hands-on activities and upcoming events. Several local college chapters will also be in attendance.

Several STEM-related talks are planned, plus some exciting live rocket launches and laboratory demonstrations! The Expo will conclude with a raffle of space-related donations.

Further information and registration can be found here.

If you are interested in volunteering at the event, contact fredlawler@hotmail.com.

INCOSE CANADA CHAPTER UPDATE

Message from the Chapter's President

Our Vision, as set out in our Strategic Plan, is to become the key enabler for the Systems Engineering community within Canada to network, collaborate, share ideas and experiences, and for dissemination of Systems Engineering (SE) knowledge and best practices. This quarter we moved closer to that vision. Not only have we been recognised with the Silver Chapter Award for best chapter practices for the second year in a row, but we rolled out the first ever SE Student Competition within Canada and continue to host additional in-person events not only in Vancouver and Toronto for the second round but also for the first time in Montreal. In line with our vision for knowledge dissemination, our Technical Program consistently delivers, attracting both established experts and emerging talents in the SE domain. These contributors bring valuable expertise and fresh perspectives to our members. Additionally, the chapter successfully facilitated a highly effective, member led INCOSE SE Handbook study group. To top up a very successful quarter, our very own Tony Wu, currently the Vice-President and President-Elect, was accepted into the INCOSE's Technical Leadership Institute! In the fall, our annual elections are due, when our members vote for the next board, so we invite all Canada Chapter members to watch their emails and Canada Chapter's website for more information.

Congratulations to Our Newest Systems Engineering Professionals!

Associate Systems Engineering Professional (ASEP):
Xavier Agustin Carballo, Ming Lei, Alexei Ofitserov

Certified Systems Engineering Professional (CSEP):
Matthew Bowman

*Many of the new Systems Engineering Professionals took part in the INCOSE Canada chapter's study group in **2023**. Another study group was initiated in **Q1 2024** in which systems engineers studied the INCOSE Systems Engineering Handbook in 12 weeks and got ready for INCOSE Certification Exam. If we have enough interest, we will be looking to start additional study groups in **Q4 2024** for those interested in pursuing either ASEP or CSEP certification. Please look for the invite from Canada chapter's website, LinkedIn and email for the next round of study group.*

Canada Chapter Q1 events

Jan 22nd - Strategic Insights: INCOSE Canada's 2023 Retrospective and Vision for 2024 (Event Recording Link)
Feb 11th - Leveraging AI in Systems Engineering (Event Recording Link)

Canada Chapter Q2 events

April 29th - Needs, Requirements, Verification, and Validation Management (NRVVM) (Event Recording Link)
May 9th – In-person meet-up in Vancouver, BC
May 17th – In-person event in Toronto, ON

Back To Table of Content

Canada Chapter Board Members in Dublin, Ireland (July 2-6, 2024), The 34th Annual INCOSE International Symposium.
(From left to right: Ivan Taylor, Stéphane Lacrampe, Ivan Rodrigues, and Ray Barton)

June 10th - Increasing the Success Rate of AI and ML Systems Deployment at the Enterprise Level (Event Recording Link)

Canada Chapter Q3 events

July 29th - Happy Hour Event: Sharing Experiences from INCOSE IS2024 (Registration Link)

The INCOSE Canada Chapter hosted a happy hour event on July 29, 2024, featuring Ivan Rodrigues, Ivan Taylor, Ray Barton, and Stéphane Lacrampe as panel members. Attendees grabbed their favourite refreshment and snack, connected with our panel members, and shared knowledge and experiences from the **34th Annual INCOSE International Symposium in Dublin, Ireland (July 2 – 6, 2024).**
We are so excited about next year's event, the 35th Annual INCOSE International Symposium in Ottawa, Ontario, Canada (July 26-31, 2025) and hope to see more Canada Chapter members in there. For more information about this event, visit IS2025 website (incose.org/symp2025).

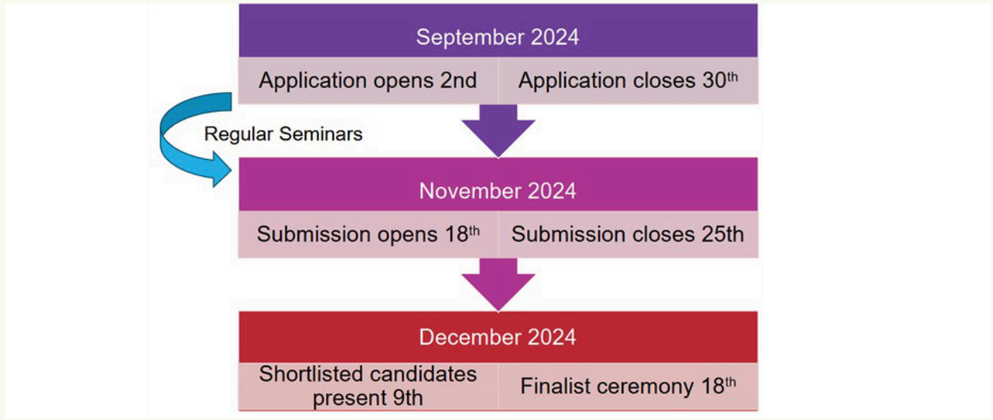
Canada Chapter Upcoming Events

Fall 2024 – Second In-person meet-up in Vancouver, BC
Fall 2024 – Second In-person event in Toronto, ON
Fall 2024 – First In-person event in Montreal, QC

If you are interested in presenting in one of the Canada Chapter's events, please reach out at canada@incose.net. Different Systems Engineering topics are welcomed including Requirements Management, Model-Based Systems Engineering (MBSE), Verification and Validation, Machine Learning/AI, Cyber Security, and Systems Safety/FMEA. ***Presenters get a certification from INCOSE Canada Chapter for their contribution to the chapter.***

Canada Chapter's SE Student Competition

The INCOSE Canada Chapter Systems Engineering Student Challenge is a premier national competition in systems engineering. Held annually, this event unites the enthusiastic and expanding community of student across Canada. The challenge connects these students with industry and the INCOSE Canada Chapter providing a focal point for the dissemination of systems engineering best practice thereby raising the awareness and understanding for systems engineering applied not only to their final year projects but also to their future careers.



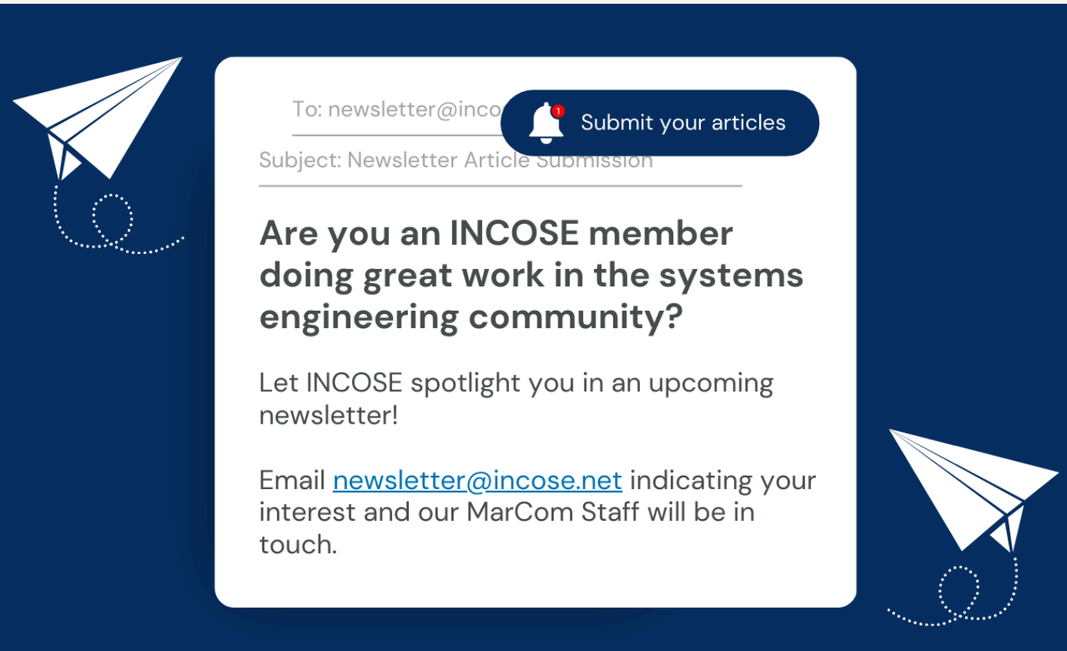
Here are the prizes awaiting our participants:

First Place: Award of CAD >= 2,000 to the project team; Certificate of Award, and free 1-year INCOSE registration for each project member (Total value of ~ 2,420 CAD).

Second Place: Award of CAD>=1,000 to the project team; Certificate of Award and free 1-year INCOSE registration for each project member (Total value of ~ 1,420 CAD).

For 3 best runner ups projects: Certificate of Honourable Mention, and free 1-year INCOSE registration for each member of recipient of award (Total value of ~ 420 CAD for each runner project).

Please visit Canada Chapter's website for further information about eligibility criteria and registration (SE Student Competition Information).



INCOSE COLORADO FRONT RANGE JUL 2024 CHAPTER EVENTS

The Colorado Front Range (CFR) Chapter of INCOSE arranged a picnic in the Denver Metro area on 27 July 2024 for its members to gather for a fun day at the park. Chapter members, student members, and Corporate Advisory Board (CAB) Associates from across the Colorado Front Range were invited to meet each other, have lunch provided by the CFR, and play games.

About 20 CFR members participated. It was a fun day to spend some time together with our local chapter members and discuss INCOSE, work, and family. For some, it was the first time they had met members in person and introduced themselves to each other. It was also an opportunity to converse with students about their degree programs and look to future jobs and careers related to Systems Engineering.

As part of the CFR Chapter's outreach, eight CFR members were selected to receive a financial offset so that they can attend the Western States Regional Conference (WSRC) in Albuquerque NM, 19-21 Sep 2024.

Stay Tuned! The CFR Board of Directors (BoD) is looking to schedule another event within the 4th Quarter of 2024, with additional events being planned for 2025. For more information, please check out our Colorado Front Range (CFR) Chapter website.

GFSE UPDATES

New web and e-mail addresses

Since its foundation in 1997, the aim of the GfSE has been to promote the best possible application and further development of systems engineering in German-speaking countries in close coordination with the International Council on Systems Engineering (INCOSE). This means that the association is now active in Germany, Austria and Liechtenstein, while a separate chapter was founded in Switzerland a few years ago. The GfSE also has some German-speaking members from other European countries.

To emphasize that the GfSE is not limited to Germany but is active throughout the German-speaking world, we have changed our web and e-mail addresses from the country-specific domain ending .de to a more general domain ending .org. From now on you can reach us at the new addresses ending with .org. Please update your saved links and addresses. A redirect from the .de addresses to the .org addresses has been set up for a transitional period.

TdSE 2024 - Boldly Shaping New Paths for the Future

The "Tag des Systems Engineering" (TdSE) is the most important Systems Engineering conference in Germany. Last year we had a record attendance of 430 participants. This year's TdSE will be held November 13-15 in Leipzig, Germany. It serves as an important gathering for individuals and professionals interested in Systems Engineering, including decision-makers, industry experts, and practitioners among attendees. Attendees typically include project managers, innovation managers, systems engineers, and systems architects from German-speaking countries. The conference is a prominent platform where industry, research, and service sectors converge, fostering collaboration and knowledge sharing. Please note that the conference language is German.

The conference features a diverse agenda of tutorials, presentations, and discussions that will allow attendees to delve deeper into topics, gain new insights, and broaden their perspectives. Among other things, you can look forward to a fascinating keynote presentation by Dr. Elena Cortona, CTO of Belimo, as well as an exciting panel discussion on "AI in the Future of Systems Engineering: SE for AI-Intensive Systems vs. AI-Assisted SE".

TdSE is known for fostering extensive interaction and networking among

You can find more information about the program here: www.tdse.org

The ticket shop will be activated in August.

Back To Table of Content

INCOSE UK UPDATES

INCOSE UK Secretariat, publications@incoseuk.org

ASEC 2024 Booking Now Open

INCOSE UK is pleased to announce that booking for the Annual Systems Engineering Conference (ASEC) 2024 is open!

Now in its 14th year, ASEC is the UK's flagship Systems Engineering conference, attracting a wide range of industry, academic and government professionals. This year's ASEC will take place in Edinburgh, Scotland. Register for ASEC 2024 at the event website.

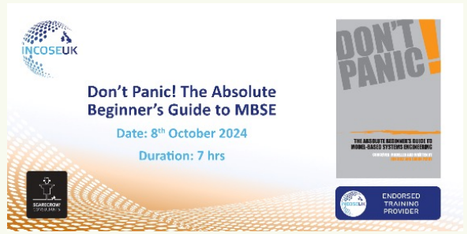
We look forward to welcoming you to Edinburgh for ASEC 2024 on 5th & 6th November 2024.

Online Course: Don't Panic! The Absolute Beginner's Guide to MBSE

Join us on Tuesday 8th October as Scarecrow Consultants lead their successful course based on the 'Don't Panic! The Absolute Beginner's Guide to MBSE' publication.

This is the perfect course for anyone who wants to learn more about Model-Based Systems Engineering and the Art of Modelling. **The course is online and can be attended from anywhere in the world.**

Book your place here.



Japanese Translation - Don't Panic! The Absolute Beginner's Guide to SysML v2

INCOSE UK and JCOSE are pleased to announce the release of the Japanese translation of the eBook 'Don't Panic! The Absolute Beginner's Guide to SysML v2' by Tim Weilkiens and Christian Muggeo.

Get your eBook copy now at the INCOSE UK Online Store.

Back To Table of Content

CALL FOR ARTICLES FOR THE INCOSE INSIGHT AUGUST 2025 ISSUE

By the Systems Security Engineering Working Group

INCOSE INSIGHT, August 2025, Theme:

Stayin' Alive is Essential – Security is a System Engineer's Problem

Context: The industrial-age foundations of systems engineering are wrestling with the digital-age security equation. The hostile predatory nature of today's operational environments needs a system's engineering doctrine emphasizing functional perseverance – where security is recognized as a prerequisite of system functionality. Security engineering is the job of security engineers, secure design is the job of all engineers, and security prioritization is the job of systems engineers. Security prioritization at its worst is simply a declaration – but at its best it is a mindset that infuses and radiates from all systems engineering activity. Functional perseverance is a systems engineering problem, not a security engineering problem; and we are just starting on this journey.

Mission: Inspire and instigate systems engineers to move in a professionally compatible and immediately rewarding direction that will enable and foster continual maturation.

Suggested Topics:

- System engineer's role
- Leveraging systems engineering skills
- Getting systems engineers engaged
- Security as a functional requirement
- Enabling dynamic security evolution
- Establishing a security mindset
- Security as a first priority
- Examples of digital-age system engineering security approaches
- … or something else compatible with the mission

Schedule

2024 Aug 15: Call for articles issued.

2024 Oct 15: (nlt preferred) Working title, and one paragraph working abstract.

2024 Dec 15 : First (complete) draft submission.

2024 Dec 30: Feedback returned on first draft.

2025 Jan 26: Second draft submission, if appropriate, for review at IW25.

2025 Feb 2: Live review: 15 minute presentation with 10 minute feedback at IW25 (in attendance or virtual).

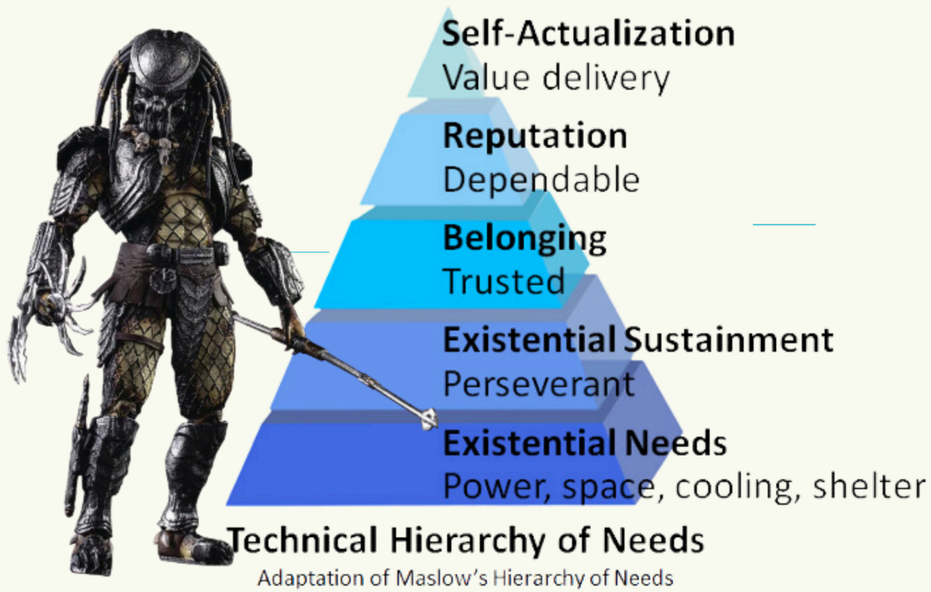
2025 Feb 15: Detailed comments returned to authors for improvement, as appropriate.

2025 May 1: Final draft submission, formatted for required style, with author-company release.

2025 Jun xx: INSIGHT editors may contact authors directly with copy-editing suggestions.

2025 Aug xx: INSIGHT publication.

Back To Table of Content



General guidance

- Articles must speak meaningfully to systems engineers.
- Do not use the MS Word reference tool. Citations and references should comply with the Swinburne Harvard reference style: http://www.swinburne.edu.au/library/referencing/harvard-style-guide. Alternatively find examples in recent-past INSIGHT issues.
- Style guide: MS Word, 12 point Times New Roman, single line spacing, indented paragraphs, with minimal or no (preferred) use of styles. Graphics are highly encouraged and do not take away from word count.

Evaluation Criteria

- Fit to the theme, and meaningful to SEs and SE issues.
- Advances the mission.
- Publishability: 2,000-4,000 words preferred, writing quality, logical, and comprehensible.

Submissions: NO PDF. Send submissions to dove@parshift.com attached as an MS Word document. Be sure to include a title, and author names and email addresses in the by-line underneath the title. Also include an abstract and short bio paragraph for each author.

Updates to this call-for-articles will be maintained at www.parshift.com/t/2025CfA.pdf

INCOSE SMART CITIES INITIATIVE PILOTS PROGRAM WITH CITY OF SAN DIEGO

By Beth E. Concepción

One way in which INCOSE is making a difference in the world is through the Smart Cities Initiative. A smart city is one that functions well in support of meeting a common goal.

The INCOSE Smart Cities Initiative team, which formed in 2019 and has five leaders and about 30 active members, devised a set of metrics to examine how a city is organized around achieving those needs and how well the city works.

They are working on a pilot program with the City of San Diego, California, to apply systems thinking to improve support systems – and communication among support entities -- for the city's unhoused population.

More than 10,000 people were homeless in San Diego just last year alone.

San Diego Chief Operating Officer Eric Dargan, who happens to be a mechanical engineer, said he was excited to work with INCOSE on the pilot program.

"As much as I would say it is a social crisis, as an engineer, I believe you can apply science to it," Dargan said. "When I met with INCOSE, it appeared to me that they are trying to make logic out of a chaotic system. When you can add logical thinking to processes for improvement, you can't help but get excited. It's been great working with them."

One of the first steps in conceptualizing the problem was to create a diagram to help visualize how a person would move from being housed to being unhoused and the factors that contributed to it.

The next step was to see how the non-governmental organizations worked with the governmental organizations.

Initiative co-chair Jennifer Russell said the next step is to identify "where are the choke points, where are the hold ups, and how can we document this?"

"They are working on a process flow," Dargan said. "That means that you should be able to approach anyone who is experiencing homelessness, understand their story, then map out a plan of the resources available to assist them to get out of the situation that they are in. I know it sounds simple. In my mind, it is simple. What we are lacking today is that people are not aware of all the resources that are available."

"The real outcome is to bring visibility to the process and support the city in their leadership of bringing together the government and non-governmental resources to really improve and systematically create processes that will support homeless people and decrease the number of homeless people in the city's population," Russell said.

Though people typically think of technology when it comes to smart cities, the INCOSE team has a different approach.

"Technology should help the human being and not the other way around," said co-chair Marcel van de Ven "That's exactly why we chose this – homelessness – because it puts the human being in the center of this. And that's the basis of our smart cities approach – to put them in the center."

The human-centric model the team created is the INCOSE-TUS Smart Cities Reference Model, which is a set of metrics to examine how a city is organized around achieving fundamental human needs and how well the city works.

The team is now socializing the metrics and piloting the approach with cities such as San Diego.

"To me, anyone who truly, genuinely wants to make an improvement, INCOSE is one resource -- I think could be a major resource – to help you look at it from a higher view and truly get your thoughts together on the process flow that needs to take place to see the improvement that you are seeking," Dargan said.

Back To Table of Content

COMPLEX ADAPTIVE SYSTEMS CONFERENCE 2025 CALL FOR PAPERS

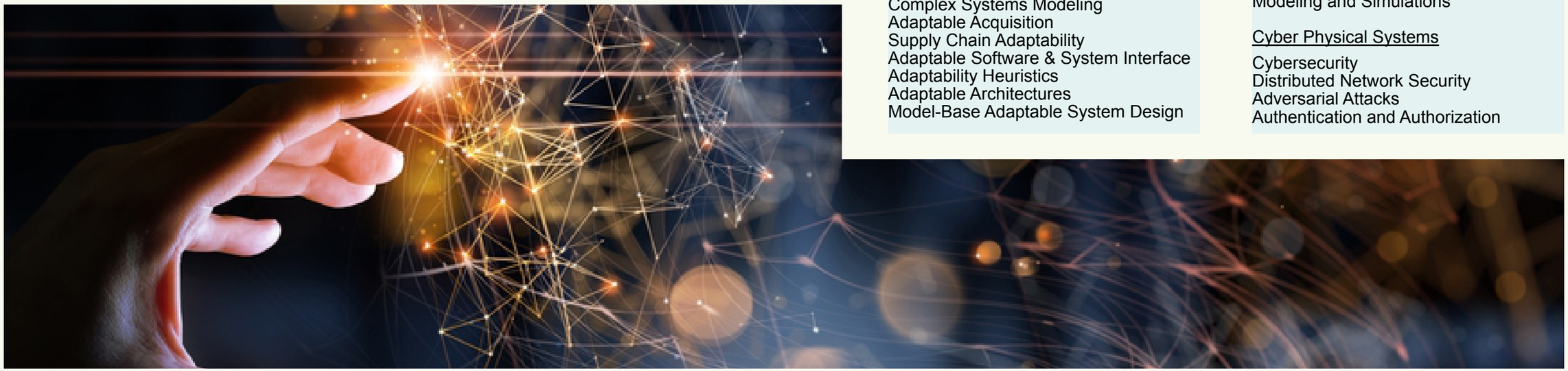
Today's product and services systems are multi-faceted, with distinct levels of implementation that entail complex logic with levels of reasoning in intricate arrangement, organized by webs of connections. These systems increasingly demonstrate self-driven adaptability, autonomy, and emergent behavior. The demand for -- and possibility of -- systems adaptability impacts design, manufacturing, and operations across defense, healthcare, energy, transportation, emergency response, agriculture, and society overall.

The Complex Adaptive Systems (CAS) Conference was founded and organized by Missouri University of Science and Technology in 2011, pushing research boundaries over the last thirteen years. Starting this year, the conference will be expanded to include a larger community of practitioners and researchers worldwide.

CAS will be named *INCOSE Complex Adaptive Systems Conference*, with leadership from the INCOSE Adaptability working group and support from Complex Systems, System of Systems, Artificial Intelligence, Risk Management and Resilience working groups. In 2025 the conference will be held on the MIT Campus. MIT System, Design and Management (SDM) will host the event with support of the MIT Department of Aeronautics and Astronautics and the INCOSE New England Chapter.

This year's theme is **adaptability of complex systems through transdisciplinary systems and solutions.** Engineering requires an increasingly *transdisciplinary* engagement, from systems concept development to solution implementation by multiple technical disciplines along with non-engineering experts and stakeholders. *How we engineer as* well as *the systems we generate* are adapting sociotechnical systems. To leverage research in CAS and to reveal CAS will enable us to better respond to the complexities we face.

CAS 2025 will balance attention to advanced research on methods with domain applications. Domain application studies are invited across a broad range of sociotechnical systems, including mobility, aerospace, agriculture, urban, medical, health care, mechanical, software, telecommunications, energy, services, acquisition, logistics, and maritime systems. The conference aims to foster innovative approaches for adaptability, autonomy, resilience, AI, complex systems, and system of systems.



Topics of Interest

Adaptability in Complex Systems

System Adaptability
Adaptive Systems
Uncertain Requirement Engineering
Switching Cost Estimation
Resilient Systems
System Safety and Reliability
Complex Systems Modeling
Adaptable Acquisition
Supply Chain Adaptability
Adaptable Software & System Interface
Adaptability Heuristics
Adaptable Architectures
Model-Base Adaptable System Design

Adaptability in INCOSE SE Vision 2035

Systems Adaptability Domain Studies

Mobility
Aerospace
Agriculture
Urban Planning and Architecture
Maritime
Medical Devices
Health Care
Mechanical
Software and Computation
Telecommunications
Energy
Services
Acquisition
Logistics

Complex Systems / System of Systems

Meta-X-Complex Systems Architectures
Rules of engagement and emergent behavior
Dynamic complex Systems Architectures
Socio-technical systems
Systems of Systems Engineering
Adaptive Control
Dynamical System Analysis
Agent Systems
Modeling and Simulations

Cyber Physical Systems

Cybersecurity
Distributed Network Security
Adversarial Attacks
Authentication and Authorization

Back To Table of Content

Identity Management and Blockchain
Smart cities and micro grids
IoT applications for integration
Security, Safety and Privacy
Mobile and Cloud Computing
Mechanical System Adaptability
Adaptive Vehicle Make

AI and Data Science

AI for Systems Engineering and Systems Engineering for AI
Computational Intelligence
Machine Learning, Deep Learning and Neural Networks
Quantum technologies
Explainable AI
Trusted AI: Robustness, Security, and Testability
Adaptive Big Data Analytics
Natural Language Processing
Clustering and Classification
Social network and social media analysis
Bioinformatics and Bio-inspired
Augmented intelligence
Ethical aspects of AI
LLMs and Generative AI
Human Factors and Adaptability

Organizers

Founding Chair

Cihan Dagli, Missouri University of Science & Technology

General Chairs

Haifeng Zhu, The Boeing Company

Bryan R. Moser, MIT

Organizational Committee

Brian Sheehan (Hosting Chair – INCOSE New England Chapter)

Ray Barton (Hosting Chair – INCOSE Canada Chapter)

Jack Stein (Hosting Chair – Assistant Director, INCOSE America Sector)

VJ Valkand (Financial Chair)

Nil Ergin (Publication Chair)

Joseph Hemenway (Publicity Chair)

Important Dates

Proposal, Tutorial and Paper Submission: **October 5, 2024**

Acceptance Notification: **November 15, 2024**

Final Manuscript and Copyright Form: **January 3, 2025**

Conference Dates: **March 5-7, 2025**

Conference Website

https://sdm.mit.edu/cas2025

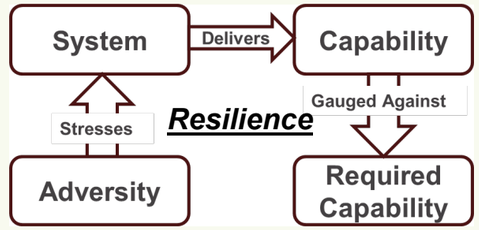
Back To Table of Content

INCOSE RESILIENT SYSTEMS WORKING GROUP (RSWG) WEBINAR

The RSWG is holding a Webinar on Wednesday, Oct 9th, at 1 PM Eastern Time (6 PM GMT). The webinar will be four hours in length for presentations with Q&A. The webinar will be virtual at no charge and will be recorded for later playback.

Candidate panel presenters and topics include:

- Dr. Timothy Ferris: Delivery of Services by a System when encountering Adversity
- Bill Scheible: Quality & Resilience (including value of Inspection relative to Quality Management)
- Dr. Scott Jackson: Five Case Studies regarding Resilience Engineering (including Proactive Resilience)
- Tony LiCausi: Survivability and Resilience
- John Brtis: In Search of Adversities, From a Resilience Perspective
- Dr. Ivan Taylor: Linking SysML and System Dynamics for Resilience Modeling
- Ken Cureton: Role of Complexity in Resilience (e.g., Emergent Behavior, Network Resilience)



SELAW WG (SYSTEMS ENGINEERING AND LAWMAKING WORKING GROUP) ASIA TRIP

By David Schrunk, co-chair of SELAW

In May 2024, my wife and I and daughter Brigitte (pictured) visited Mongolia and Japan. The purpose of our visits was to meet and exchange information with INCOSE members regarding SELAW's mission to develop science-directed lawmaking processes for democratic governments.

In Ulaanbaatar, Mongolia, we were the guests of Jargal Byambasaikhan and Bayaraa Byartsengel, of the TUSS Engineering Corporation (https://www.tuss.io/). They were excellent hosts for our visit, and they introduced me to several government officials to discuss SELAW concepts for laws and lawmaking (Mongolia is a constitutional democracy). Of interest, Jargal and Bayaraa (also members of the INCOSE Smart Cities Working Group) are involved with the Mongolian Legislature's review of standards for the creation and management of laws, including requirements for problem definition, purpose statement, cost-risk analyses, references, and validation of outcomes.

In Japan, we met with Assistant Professor Yoshiko Ohno, Keio University, who participated in the creation of the Ministry of Economics, Trade, and Industry (METI) publication of "Governance Innovation, Ver 2.1., 2021." This forward-looking document ("Agile Governance") proposes a flexible (as opposed to a "rigid top-down") approach to lawmaking, with emphasis on the collection and use of feedback data to review, adjust, and improve law

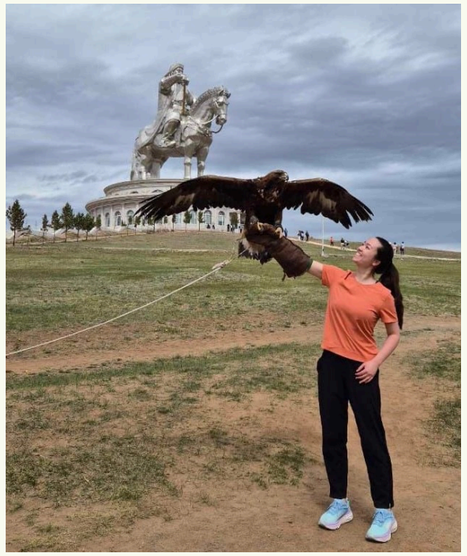


Photo: Brigitte Schrunk on Mongolian field trip with young hunting Eagle and 40-meter-tall Genghis Khan Statue in background.

performance – and with the objective of meeting the goals of democracy, of human rights, liberty and the pursuit of happiness.

It was a very successful trip: we (SELAW, TUSS / Mongolia, and METI-Japan) are all involved with the advancement of knowledge-based lawmaking processes to improve the performance of democratic governments, and we plan to exchange ideas and explore opportunities for collaboration in the future.

Back To Table of Content

INCOSE AMPLIFIES DEI IN ENGINEERING EDUCATION

By Federica Robinson-Bryant

It takes a village, or in this case, a panel of experts, to drive meaningful change. This year's American Society for Engineering Education (ASEE) Annual Conference echoed this sentiment as a distinguished panel of experts convened from the Corporate Member Council (CMC) to address the critical issue of Diversity, Equity, and Inclusion (DEI) within the engineering field. Moderated by PJ Boardman (Mathworks), the panel featured Dr. Christine Cunningham (Museum of Science), Dr. Beverly Watford (Virginia Tech), Dr. Sarah Rajala (ABET), and Dr. Federica Robinson-Bryant (INCOSE). Together, these leaders brought a wealth of experience and expertise to the discussion, representing various sectors of the engineering ecosystem. Their collective

voices amplified the urgency of addressing DEI challenges and offered

Table 1 summarizes the main points captured from the panel:

Topics	Key Takeaways
Frameworks for DEI	ABET's Inclusion, Diversity, Equity and Accessibility (IDEA) Dynamic Framework; Equity-Oriented Engineering; Royal Academy of Engineering Diversity & Inclusion Progression Framework
Legal Challenges and Opportunities	Data-driven Outcomes; Transparency; Inclusion; Legal Counsel; Collaboration; Leverage Legal Victories; Shifting Demographics; Positive Press; Advocate for Standards
DEI for P-12	Promote STEM Education; Hands-on Activities; Industry Involvement; INCOSE's SySTEAM Initiative; Children's Literature
Industry's Partnership in DEI	Partner with Educational Institutions; Investments in Higher Education; Skill Building Programs; Mentorship; Inclusive Workplaces; Infinity Groups; Networking Opportunities (intra-organizational/extra-organizational); Serve on Advisory Boards

actionable tools and strategies for creating a more inclusive and equitable future.

The panel session, titled "Strategies for Advancing Diversity, Equity, and Inclusion: Breaking Barriers and Creating Pathways," emphasized the importance of a comprehensive approach to DEI, encompassing P-12 education, higher education, industry, and professional organizations.

The panel delved into four key areas, sparking rich discussions among panelists and attendees. The exchange of ideas generated a wealth of actionable insights that participants could directly apply to their organizations. For those already engaged in DEI initiatives, the discussion also provided renewed momentum and a shared sense of purpose.

Frameworks for DEI

The panel explored various frameworks to guide DEI initiatives. ABET, as represented by Dr. Sarah Rajala, has developed a dynamic framework to advance DEI. This framework includes specific objectives, recommended actions, and performance indicators to measure progress. Importantly, it also assigns responsibility for implementing DEI strategies and reaching established goals. Dr. Christine Cunningham highlighted the critical role of equity-oriented engineering in addressing societal challenges and promoting social justice, while Dr. Beverly Watford emphasized the role of individual faculty members in driving change within higher education. Meanwhile, Dr. Federica Robinson-Bryant introduced INCOSE's implementation of the Royal Academy of Engineering's Diversity & Inclusion Progression Framework, a robust tool that can help professional organizations measure progress, identify gaps, and implement targeted strategies to foster a more inclusive workplace.

Navigating Legal DEI Complexities

Panelists addressed the complex and evolving legal landscape surrounding DEI initiatives, particularly in states like Virginia, North Carolina, and Florida. Some states have introduced legislation that poses significant challenges for leaders seeking to advance DEI efforts. Navigating this complex terrain requires strategic planning, legal expertise, and a deep commitment to equity. Leaders must carefully consider the potential legal implications of their DEI initiatives while maintaining a focus on creating inclusive and equitable environments. Each panelist emphasized the importance of data-driven approaches, transparency, and collaboration in navigating these complexities. The panel concurred on the need for a focus on inclusion rather than simply compliance.

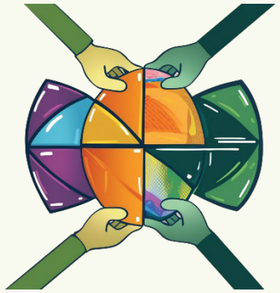
Back To Table of Content

Cultivating Future Talent

To cultivate a more diverse and robust pipeline of engineers, the panel highlighted the critical importance of early exposure to STEAM education. Dr. Christine Cunningham emphasized the transformative power of hands-on activities and community engagement in inspiring young minds, citing successful projects at the Museum of Science as prime examples. Dr. Robinson-Bryant discussed the potential of efforts like INCOSE's SySTEAM initiative to foster systems thinking skills in P-12 students, a foundational element of engineering. The panel stressed the value of investing in comprehensive P-12 STEAM programs to equip future generations with the skills, knowledge, and inspiration needed to tackle complex challenges and drive innovation.

Industry as a DEI Partner

The panel recognized the crucial role of industry in advancing DEI. Dr. Sarah Rajala discussed the importance of industry advisory boards in shaping university programs. Dr. Beverly Watford



emphasized the need for industry to address the lived experiences of students and invest more strategically in higher education. Dr. Christine Cunningham highlighted industry's role in advocating for a more skilled workforce, while Dr. Robinson-Bryant called for industry to partner with academia throughout the entire talent lifecycle and highlighted the impact of storytelling in supporting DEI initiatives.

Call to Action

Three of the four INCOSE strategic objectives address advancing systems engineering, expanding the system engineering community, and fostering professional development and systems engineering competencies. To forge a more inclusive engineering future, we must harness the power of storytelling, collaboration, and empathy. By sharing experiences, advocating for equity, and working together across academia, industry, and professional societies, we can create a field where every member of the community feels valued, respected, and empowered. Continual development and sharing of DEI tools, strategies, and lessons learned are essential. By cultivating inclusive communities and building an engineering profession that mirrors the diversity of our world, we will unlock the full potential of every engineer.

REQUIREMENTS WORKING GROUP

By Lou Wheatcraft

This year has been very busy for the Requirements WG. Getting the Needs and Requirements Manual (NRM) ready for publication, major updates to both the public-facing RWG website as well as the internal iNet website, updates to the SEBoK, collaboration with other WGs, conducting our monthly meetings, responding to various chapter requests for presentations, hosting a RWG session at IS2024, and the formation of several projects. These projects include the development of a Guide to Model-based Needs and Requirements and the development of a series of NRM fundamentals flip cards.

The Requirements WG had a dedicated session at IS2024. As for IW2024, It was good to see the number of attendees where this was their first IS they had attended and their interest in needs, requirements, verification, and validation across the system lifecycle. An overview of the RWG was presented, discussing what the RWG was about, our web page presence, presentations on the INCOSE RWG YouTube Channel, our Viva Engage community, our products, our outreach activities, and how to become a member of not only the RWG but also other WGs of interest. We then addressed activities the leadership worked on during the first half of 2024 and our plans for the rest of the year. The rest of the session was devoted to open discussions concerning questions concerning challenges attendees are having concerning needs, requirements, verification, and validation across the lifecycle.

Lou Wheatcraft, Mike Ryan, and Tami Katz reviewed and commented on the final proof of the NRM. Mike also developed the index. Once our comments are addressed, Wiley will be publishing the NRM later this year in both hardcopy and digital form. Like the INCOSE SE HB, a digital copy will be made available to INCOSE members via the INCOSE Store.

Katarzyna Kot has done a major revamp of both the public-facing RWG website as well as the internal iNet website with the goal of providing more value to our members. The iNET site now has more detailed information on each of our projects. From a training perspective, videos that were on the INCOSE RWG YouTube channel are now available on the iNET site, organized by product in a way to facilitate the use of the videos for training. The YouTube videos are in the process of replacement by original video files stored at INCOSE servers so that people don't have to watch YouTube advertisements. A summary of each of the projects is provided as well as a link to individual pages that contain supplemental information (files, presentations, links, videos) developed by the project teams.

Tami Katz led the effort to update sections of the SeBOK dealing with needs and requirements aided by inputs and review comments from Lou Wheatcraft and Mike Ryan. Collaboration efforts included working with the Configuration Management WG to co-author a paper, Traceability – A Vision for Now and Tomorrow. Adriana D. Souza, co-chair of the CM WG, led the effort to develop the paper and presented it at IS204. We also supported the efforts of the Systems Security Engineering WG led by Beth Wilson to develop a Guide to Security Needs and Requirements (GTSNR). This guide was just approved and is now available in the INCOSE Store. We are also working with other WGs to develop similar domain-specific guides based on the tailoring of the concepts and activities defined in the NRM to fit the terminology specific to their domain. If any WG is interested in developing such a guide, let us know. The form of the GTSNR provides an easily tailored template for other guides.

At our session at IS204, Jeff Williams provided a brief status update concerning his team's work to develop the Guide to Model-based Needs and Requirements (GTMBNR) that addresses the implementation of the concepts and activities defined in the NRM from the perspective of developing language-based models. Jeff also hosted a session in August to obtain peer review comments concerning the Guide. All the materials concerning this project are, or will soon be, available on the RWG iNet site.

At IS2024, a new project was proposed by Rob Black to develop a series of flip cards addressing fundamental concepts discussed in the NRM. His presentation and video will be made available on the RWG iNet site in the near future.

Chapter presentations by Lou Wheatcraft included a presentation, "Needs and Requirements Manual Section 14 Needs, Requirements, Verification, & Validation Management," presented to the INCOSE Canada Chapter and "Verification and Validation Across the Lifecycle," presented to the INCOSE LA Chapter.

Kevin Orr led our efforts to provide monthly meetings for our members. The meetings are now scheduled at two different times to better meet the schedule constraints of our members. A listing of past meetings and future meetings is available on our public-facing web page, along with a copy of the slides and presentations as they become available. Sessions are announced both via email to our membership as well as on our Viva Engage community site.

If any of the readers have a specific topic of interest they would like to learn more about, help with, become more involved in, or to suggest a discussion topic at one of our monthly meetings, let the RWG leadership know at requirements-leaders@incose.net.

Back To Table of Content

INFORMATION COMMUNICATIONS TECHNOLOGY (ICT) WORKING GROUP

The INCOSE ICT working group strives to educate and inform INCOSE members, other INCOSE working groups, and industry on the necessity and importance of Network Technologies in modern Systems Engineering efforts.

The ICT has developed a 10-item awareness list that Systems Engineers may wish to consider in their various projects. Systems Engineers are not expected to be network architects, design engineers, or operators. However, the ICT working group suggests that reviewing and considering these 10 items may lead to a more successful project with higher customer satisfaction.

1) ***Network Infrastructure*:** Understand the underlying network infrastructure that will be used for network communications in your project or company.
   a) Consider aspects such as bandwidth, latency, reliability, and scalability.
   b) Evaluate the available network options and choose the most suitable ones for your project's requirements.
   c) Remember to review how mobile devices, voice services, and IoT devices will be obtained and managed.
2) ***Security:*** Prioritize the security of the communication system.
   a) Implement appropriate security measures such as encryption, authentication, and access controls to protect sensitive data and ensure confidentiality, integrity, and availability (CIA).
   b) Stay updated on the latest security best practices and adhere to industry standards.
3) ***Protocols and Standards***: Select appropriate communication protocols and adhere to relevant industry standards.
   a) For example, if the system will be transmitting data, consider using network services that offer protocols like HTTP, TCP/IP, or MQTT. Compliance with such standards ensures compatibility and interoperability with other systems.
4) ***Data Validation and Error Handling***: Implement mechanisms to validate incoming and outgoing data to ensure its integrity and prevent vulnerabilities.
   a) Consider implementing error detection and correction techniques, such as checksums or error-correcting codes, to handle transmission errors effectively.
5) ***Bandwidth and Performance***: Evaluate the bandwidth requirements of your project and ensure that the communication system can handle the expected data volume.
   a) Consider the inter-data center traffic, major site (i.e., Cloud), internet demand, and remote user needs.
   b) Employ design and engineering techniques to optimize data transmission. For example, where applicable, employ compression or minimize data payloads.
6) ***Scalability and Redundancy***: Anticipate future growth and ensure the communication system is scalable to accommodate increasing demands. Consider implementing redundancy measures, such as load balancing or failover mechanisms, to ensure high availability and minimize single points of failure.
7) ***Quality of Service (QoS)***: If your project requirements include specific performance guarantees such as a guaranteed availability or uptime percentage, define and prioritize the desired QoS parameters to support the requirement(s). This may include aspects such as latency, packet loss, throughput, or prioritization of certain types of traffic.
   a) Ensure that mechanisms and tools to monitor and enforce QoS requirements are defined.
8) ***Compatibility and Interoperability***: Consider the compatibility of your communication system with other systems or platforms and obtain concurrence that all systems will work together as required.
9) ***Monitoring and Logging***: Implement monitoring and logging capabilities to track the performance, availability, and security of the communication system. Ensure policies and processes are defined to monitor network traffic, system health, and error logs to identify and troubleshoot issues promptly. This data can also provide valuable insights for system optimization and future enhancements.
10) ***Compliance and Regulatory Requirements***: Consider any industry-specific regulations or compliance requirements that may apply to your project. For example, if your system involves financial transactions, unique government and industry security policies may need to be implemented. Ensure the communication system design meets these requirements and incorporates necessary privacy or data protection measures.

Find out about the ICT Working Group.

Back To Table of Content

THE INCOSE SEQM WORKING GROUP AND THE QUALITY MANAGEMENT INSTITUTE PRESENT QUALITY MANAGER CERTIFICATION TRAINING

The SEQM working group is proud to announce the continuation of its Quality Management training and certification program! Quality Management is a discipline that impacts and influences most all areas of Systems Engineering and Businesses/Governments worldwide.

If you are unaware of this unique opportunity, the SEQM working group has teamed with the Quality Management Institute (QMI) to offer full scholarships for INCOSE members to attend QMI's online training and certification program for Quality Managers. Some informative details on the QMI program can be found at (https://qualitymanagementinstitute.com/incose/). This training features online courses combined with bi-weekly cohort discussion meetings with a focus on Systems Engineering.

Join the over 40+ graduates of this training and certification program for the next cohort starting on September 17, 2024, at 2:30 PM Eastern. The course outline and syllabus can be found on the INCOSE SEQM Systems Engineering Quality Management in the INCOSE Viva Engage group.

Pre-registration is required and can be accomplished by sending an email of interest to bill.scheible@incose.net. Please include your INCOSE membership number in the email, and use your INCOSE profile option to join the SEQM working group.

We look forward to your joining the Quality Management revolution!

INCOSE FELLOWS AND OUTSTANDING SERVICE AWARDS NOMINATIONS

Nominations are now open for two prestigious INCOSE awards: the **INCOSE Fellows Award** and the **Outstanding Service Award**. Nominations are open until **1 December**.

INCOSE Fellows Award

Fellows are INCOSE members who have been recognized as having made significant sustained verifiable contributions to the field of systems engineering. This recognition is awarded for life. Nominees must have at least two years of active membership in INCOSE and impact through thought leadership which advanced the field of systems engineering. Read more about this award's requirements.

Outstanding Service Award

This award recognizes individuals who have provided exceptional service to INCOSE through their volunteer contributions and leadership. Nominees must have a minimum of five years of active membership in INCOSE and have demonstrated a commitment to advancing the goals and objectives of the organization. Read more about this award's requirements.

Visit the INCOSE Honors & Awards webpage for information about all awards and how to submit your nomination.

We encourage you to nominate deserving individuals who have made a significant impact on the systems engineering community.

Your nominations will help us recognize and celebrate the achievements of our members!

UPDATES FROM INCOSE'S TECHNICAL LEADERSHIP INSTITUTE

By Suja Joseph-Malherbe, TLI Coach, suja.joseph-malherbe@incose.net

As Cohort 8 looks toward how they will continue their learning journeys as full members of the Institute, members of Cohort 9 are focusing on topics that are specifically relevant to them. Based on the burning questions they identified, Cohort 9 will be pursuing three major projects over the coming months:

- Towards shared understanding in a multidisciplinary space
- Understanding the role of vision in the context of project teams
- Developing self-awareness and our ability to lead

Hosting social and topical engagements at the International Symposium in Dublin are ways the Institute seeks to support each member's ongoing learning journey. We had the pleasure of holding additional conversations with Mark Kelly and Dave Snowden beyond their informative and engaging keynotes.

Mark Kelly spoke to the kind of mindset required to lead in the world of AI. He talked to the fact that great leaders are not necessarily the smartest person in the room. They are willing to bring people on the journey with them. They are open to change and getting their hands dirty. They are not afraid of being wrong and are also open about being wrong. With rapidly changing environments such as the impact of AI, a leader's responsibility is to aid teams and organizations to navigate the journey, starting with little wins that will lead to inspiring people to get on board.

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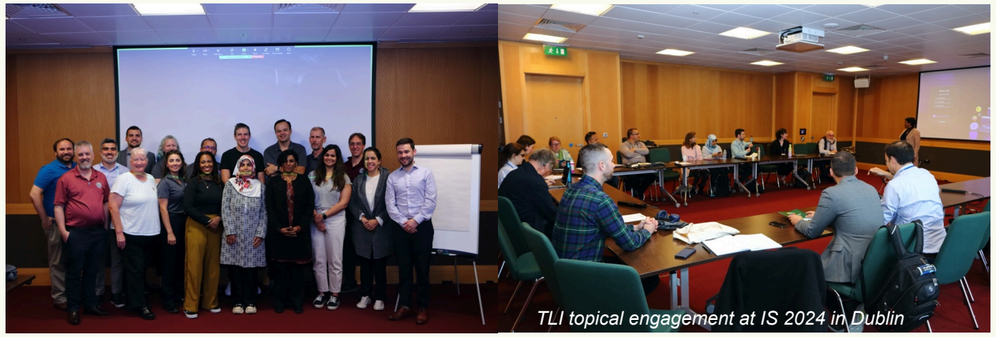


TLI topical engagement at IS 2024 in Dublin

Cohort 8

Top Row (left to right): *Molawa Ngoetjana, Hensoldt GEW (South Africa); Aurelijus Morkevicius, Dassault Systèmes (Lithuania); Jordan Howie, Aerospace Corporation (USA); Hannah Zeigler, BAE Systems (USA); Luis Andés Olmedo, Airbus (Germany); Robert Schwenke, Sandia National Labs (USA); Alexander Chang, Aerospace Corporation (USA); Carlo Leardi, TetraPak (Italy); Mikaela Stewart, Cubic Transportation Systems (Australia); Eric Specking, Infinity Labs (USA)*

Bottom Row (left to right): *Andrew Murrell, Northrop Grumman (USA); Leandro Aveiro, Alstom (USA); Adam Williams, Sandia National Labs (USA); Rachel McGrath, Pratt & Whitney (USA); Karman Joshi, BAE Systems (USA); Christian Parra-John, Shoal Group (UK); Dimitri Masson, ESTIA (USA); Adrian Unger, VENG (Argentina); Guillaume Terpant, Dassault Systèmes (France); Donna Long, Blue Holon (USA)*

talked to the fact that great leaders are not necessarily the smartest person in the room. They are willing to bring people on the journey with them. They are open to change and getting their hands dirty. They are not afraid of being wrong and are also open about being wrong. With rapidly changing environments such as the impact of AI, a leader's responsibility is to aid teams and organizations to navigate the journey, starting with little wins that will lead to inspiring people to get on board.

A few things for further consideration from our dialogue with Dave Snowden include: (1) Doing small actions and then allowing things to emerge, that is, small actions change perceptions in an evolutionary way. (2) At the executive level, one hardly ever makes decisions unless there is a real crisis. Mostly, you should not try and solve the problem but rather create the environment for other people who have the real data to make the decisions (in the process, we avoid introducing mediating layers between

Back To Table of Content

the decision maker and the raw data). (3) If one is required to make a decision, share the problem with a wide audience (using informal networks and doing mass consultation) and respond accordingly based on the patterns of response. (4) The fields of cognitive neuroscience, evolutionary biology, and complexity theory have changed radically over the last decade and the business and engineering worlds need to seriously consider these factors. For example, one does not talk about taxonomies in biology because they create false structures. (5) Don't talk about mental models or mindsets; rather, talk about attitudes. When we talk about mental models or mindsets, we are framing the problem in the way we want to get the solution.

TLI members gather socially at IS 2024 in Dublin

LEARNING & GROWING IN INCOSE: REFLECTIONS ON WORKING WITH SYSTEMS ENGINEERS

By Kirk Michealson

You may know me or my name as INCOSE's Policy Management Committee Chair, Outreach Director, and / or Professional Development Portal Project Manager before my retirement in June. But did you know that I am *not* a Systems Engineer? I'm an Operations Research Analyst or OA. Do you remember the word problems you did in high school algebra (if so, probably not fondly)? OAs solve real world word problems using probability, statistics, models, and simulations.

So, who am I? I have a BS and MS in Operations Research Analysis. I am a retired US Navy Surface Warfare Officer and retired Lockheed Martin Fellow for Operations Research Analysis. For my other professional society, i.e., the Military Operations Research Society (MORS), I am a past President, current Fellow, and a recipient of the OA Practitioner of the Year award. When I was not at sea while in the US Navy, I had OA tours in the Pentagon. When I worked for the Chief of Naval Operations, I did the analysis to determine the expected service lives of surface combatants. Then, when I worked for the Secretary of Defense, I did the force structure analysis for the first Quadrennial Defense Review (QDR) to determine how many total ships were needed in the US Navy in both peacetime and wartime.

Image: 1991: I was USS Cowpens (CG 63)'s Chief Engineer receiving the Navy Achievement Medal (NAM) from Captain (now Vice Admiral) Ed Moore for leading my engineering department and Bath Shipyard to a record setting Light Off Examination (shipboard inspection) with the least amount of discrepancies in the least amount of time for all Aegis Cruisers built.

After I retired from the Navy, I worked for Capital One Credit Cards and Lockheed Martin. At Capital One, we were having a problem with credit card owners not paying their bills, and our liquidation rate (amount paid over amount owed) was low. I led the analysis and project management to double the liquidation rate and receive millions of dollars more than before. At Lockheed Martin, I developed the corporate experimentation and demonstration process used at their Center for Innovation (or Lighthouse), as a Lean Six Sigma Black Belt I facilitated LM Aeronautics in developing the product flow building aircraft, and working with all OA Teams I led an OA Workforce Development project determining what skills, experiences, and training needed to be a successful OA at Lockheed Martin.

Back To Table of Content

After I took early retirement from Lockheed Martin, I realized I missed working. As I started looking for work, INCOSE Past President Garry Roedler hired me as a part-time contractor at Lockhead Martin. While working with Garry, we determined that at Lockheed Marin, SEs and OAs use about 75-80% of the same tools to conduct analysis, but we analyzed different things: SEs analyze systems and system of systems while OAs look at missions and operations. Because of the amount of overlap and work quality, Garry has tried to convert me to be an SE since 2015.

Image: 2024: Me on our Disney Wish cruise we took for my retirement, having a drink in their Star Wars Lounge.

It was then that I first learned of INCOSE. At the time, the Office of the Secretary of Defense Acquisition, Logistics, and Logistics (OSD-ATL) was interested in Affordability and Affordability Analysis. As the MORS Affordability Analysis Community of Practice Chair, I led two workshops to determine what affordability analysis was, and to develop a process for doing it. In addition to OAs from MORS, Garry brought in INCOSE's affordability working group (the WG is now retired) with Systems Engineers, and the International Cost and Estimating and Analysis Association (ICEAA) provided cost analysts plus military, government, and civilian analysts and leaders to participate in both workshops and publish an Affordability Analysis process document for OSD(ATL).

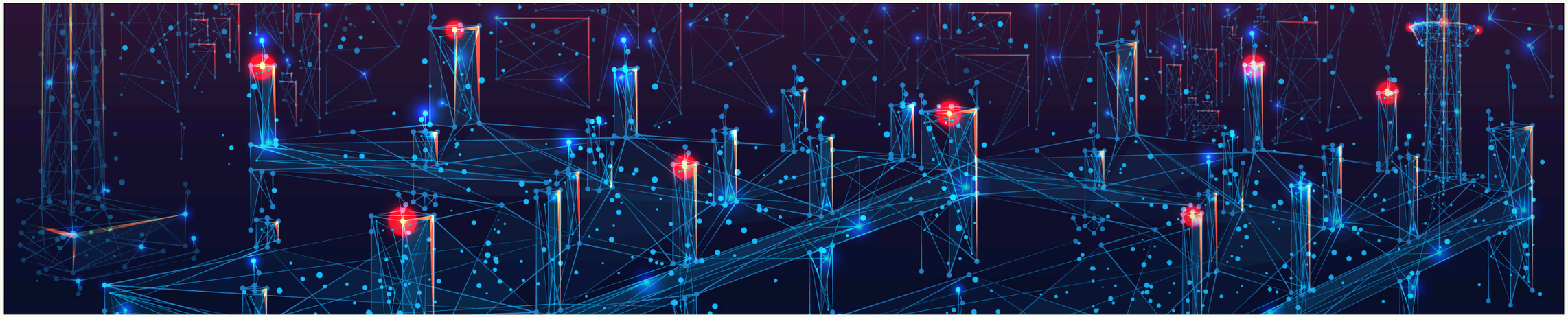
When Garry Roedler became the INCOSE President, he received permission from his leadership to let me work INCOSE projects under my contract. I was excited because of the professionalism I observed from INCOSE Systems Engineers during the affordability analysis project and was looking forward to working with SEs again. I worked with INCOSE for 6 years. I spent all 6 years with the Policy Management Committee (PMC) – two as the project manager and four as the chair. I had the opportunity to work with every board member during that time and learned about all their duties and organizations developing and updating their policies, procedures, templates, and forms. By working with the board members for their policy management and participating in board meetings, I learned a lot about INCOSE overall. Even though I wasn't a Systems Engineer, through my PMC duties I was provided a good foundation to grow in INCOSE.

Image: 2024: Receiving an award In Recognition of Dedicated Service as the Policy Management Committee (PMC) Chair (2021-2023) and Director of Outreach (2023)

Part of my contract working for INCOSE President Kerry Lunney (which continued under President Marilee Wheaton), I was asked to work with Don Gelosh to develop the Professional Development Portal (PDP) which was a 2013-14 CAB Priority. From what I learned from the PMC and the Board, while building the PDP I knew who to contact within INCOSE to create the PDP on the web (IT). Additionally, I found learning resources through training providers and then connected the PDP to other INCOSE organizations (e.g., competency working group, certification, tech ops for IS domains, academic council, SE Handbook POC for SE processes, Fellows for heuristics, and mentoring). While working on the PDP and not being an SE, I learned that an OA knew most of the competency areas in the INCOSE System Engineering Competency Framework (ISECF) with systems thinking from the core group and with all the competency areas from the technical group being the exceptions. With that stated, I learned about all of them and realized I have been using those competencies, too (e.g., systems thinking).

The longer I worked with INCOSE, the more I learned about it and Systems Engineering. All the projects I was involved with while in INCOSE received good reviews, and that is because of the quality and professionalism of the Systems Engineers in INCOSE. All in all, Garry Roedler might have been right trying to convert me to being a Systems Engineer, or at least completing the Systems Engineering Professional certification. The bottom line, I enjoyed myself working with INCOSE the last 6 years! Thank you all very much!

Back To Table of Content



BEYOND THE MACHINES: THE PEOPLE POWERING THE FUTURE OF ROBOTICS

Agile Robots SE

At Agile Robots, a team of passionate individuals led by visionary founders and fueled by a commitment to collaboration is shaping the future of robotics. This isn't just a tale of machines and algorithms; it's a testament to the transformative power of human ingenuity accompanied by the principles of systems engineering.

In 2018, Dr. Zhaopeng Chen, a leading expert in robotics with a PhD in Mechatronics Engineering, and Peter Meusel, a distinguished engineer with over 30 years of experience at the German Aerospace Center, joined forces. Together with a team of co-founders, they envisioned a new kind of robotics company that aims to bridge the gap between AI and robotics by developing systems that offer state-of-the art fully-body force sensitivity and world-leading vision intelligence. Today, Agile Robots boasts over 1,900 employees across its international production sites and its corporate headquarters in Munich.

The Power of Systems Engineering and the INCOSE Connection

Agile Robots caught INCOSE's attention through two Certified Systems Engineering Professionals (CSEPS), Andreas Spenninger and Mohamadreza Sabaghian. Their story began over ten years ago when they were both part of a small, elite team that created the first tactile robot: The Franka Emika robot (formerly known as Panda). The robot quickly gained popularity in research and academia and even made the cover of TIME Magazine in 2018.

Today, Spenninger and Sabaghian both play vital roles at Agile Robots: Spenninger is an Industrialization and Safety Manager who manages the development of industrial-grade products, and Sabaghian works in product management within a slightly adapted version of the SAFe framework. Both INCOSE members emphasize the transformative role that systems engineering has played at the company and within their own roles.

"I apply several systems engineering (SE) skills that I've acquired through my participation in INCOSE. These include systems thinking, which allows me to understand the interconnectedness of product components and anticipate potential interactions. Additionally, I utilize requirements management techniques to effectively gather, analyze, and prioritize product requirements to align with customer needs and business objectives. I also employ risk management practices to identify and mitigate potential risks associated with product features and development processes. Furthermore, stakeholder engagement strategies learned from INCOSE help me in effectively communicating with key stakeholders to ensure alignment and support for product initiatives."

- Sabaghian

Spenninger also values the skills he has learned from INCOSE: "In my current role," he says, "I leverage a wide range of systems engineering skills to ensure the safe and efficient development of our robotic systems." These skills include technical planning, where he collaborates with project managers to establish production processes and quality measures. "We use systems engineering skills like lifecycle process definition and information management to ensure our robots are not only cutting-edge but also safe and efficient throughout their entire lifespan." Systems engineering principles provide a structured approach to breaking down complex tasks into manageable steps. This ensures that all aspects of the product development process are considered, from design and manufacturing to safety and regulatory compliance.

Certification and Community

Spenninger and Sabaghian are both proud CSEPs, and they recognize the impact of their certification on their career paths. Spenninger sees it as a way to gain knowledge and build a

Back To Table of Content

network, stating, "The CSEP journey was about much more than just getting a badge. It was about deepening my understanding of systems engineering principles and connecting with a global community of experts." Sabaghian highlights the increased credibility and access to authoritative resources it provides. "The CSEP designation demonstrates a commitment to excellence in the field," he says, "It also gives you access to a wealth of resources and best practices that can be invaluable for any systems engineer."

In addition to INCOSE SEP certification, their involvement with the greater INCOSE community has also impacted their journeys. Spenninger values the opportunity to exchange ideas with senior system engineers and INCOSE members, crediting them with helping him to "professionalize my skillset and open new doors." Sabaghian agrees, adding that INCOSE has provided him with a platform for "deepening my understanding of systems engineering principles and methodologies." He highlights INCOSE's collaborative nature: "Collaborating with fellow professionals and experts in the field has not only expanded my knowledge base but has also provided a platform for exchanging innovative ideas and best practices."

Agile Robots Value for INCOSE Members

Spenninger and Sabaghian encourage INCOSE members to check out Agile Robots SE for any company looking to venture into robotics automation. Their "intelligent, easy-to-use, and affordable robotics solutions" target a broad range of industries. They focus on providing practical and user-friendly robotics solutions for those looking to improve efficiency and automate specific tasks. Agile Robots' current product gallery includes intelligent robotic arms, a multi-sensory anthropomorphic robotic hand, and a software platform designed to streamline the development and deployment of robotic automation solutions.

INCOSE members may also want to investigate the company if they are interested in joining as an employee. Spenninger says to anyone considering applying, "As a System Engineer at Agile Robots SE, responsibilities cover a broad and interesting spectrum of tasks and roles. Use your requirements engineering skills to develop and maintain requirements documentation, including functional, safety-related, and technical requirements. Use your knowledge of architecture definition to contribute to technical architecture and its documentation. Use your knowledge management skills for (re)organizing and maintaining technical documentation." The possibilities are endless for applying your systems engineering knowledge and experience at Agile Robots.

Spenninger concludes, "Agile Robots is a testament to the transformative power of systems engineering. It's not just about building robots; it's about building a successful and sustainable business." His parting words align perfectly with CEO Dr. Zhaopeng Chen's vision: combining cutting-edge robotics technology with a focus on intelligent, easy-to-use, and affordable solutions fueled by a dedicated team committed to systems engineering principles.

Visit Agile Robots SE's webpage to learn more about how their products can enhance your business or join their team.

You can also connect with Andreas Spenninger and Mohamadreza Sabaghian on LinkedIn to follow their incredible career paths.

Back To Table of Content

“SURFING THE DIGITAL WAVE”

By Deepaa Ganesh

Can Innovation ride the waves of digital transformation with cutting edge ideas?

Innovation is challenged by digital transformation!

Our customers-centric strategy now needs to explore cutting edge technology involving an innovative approach towards cost awareness, operational efficiency, and the expansion of customer experience thus involving necessary adaptation to current and future markets.

An article by Oquz A. Acar. Murat Tarakci and Daan Van Knippenberg in the 29th October 2018 Harvard Business Review defined innovation:

“The free flow of imagination without any limitation. Yet science suggest that individuals teams and organisations can benefit from a healthy dose of constraints”

As we all know, innovation comprises the excitement of invention and the constraints of commercial markets. In addition, we must consider the constraints of time, resources and cost.

Take time for example: Short term deadlines encourage efficient and expedient exploration of priorities. Tight time constraints also drives effective deployment of available resources.

For Example: *During World War II, the British Royal Air Force (RAF) faced a shortage of effective radar systems to detect incoming enemy aircraft. Physicist Robert Watson, tasked with finding a solution, improvised by using existing radio technology. Instead of focusing on detecting aircraft directly, he developed the chain home system. This utilised radio waves to detect the presence of enemy aircraft by bouncing signals off them.*

This innovation played a crucial role in the Battle of Britain and significantly contributed to the success of the RAF. (Example copied from Medium)

Resourcefulness may be inhibited by cost effectiveness. The companies are actively encouraging more open lines of communication between individuals and teams to promote the free and collaborative exchange of ideas.

Now we need the freedom to think innovatively in a digital world. We also need the freedom and courage to take calculated risks recognising that these are integral to the innovative process but also present an opportunity to redefine our approach to change.

Creating inventions and innovations has not always been easy: it takes time and consultations.

Could informal collaboration among teams be the springboard to promote innovative ideas?

How can company leaders effectively drive innovation within their company to enhance overall success?

It is crucial to unite the entire team around a shared vision of innovation, combining invention with recognised constraints while invention can be a solo effort or the achievement of a team.

Successful product creation, demands collaboration and coordination among different departments such as engineering, marketing and sales. Collaboration ensures a comprehensive outcome and the delivery of a viable commercial product.

Informal collaboration can also prove to be more effective in an accelerating iterations and encouraging rapid and honest feedback within a creative working environment. Moreover, Innovation will bought from a systematic approach to integrate digital innovation with technical creation of product development in order to deploy a new product system. Such a comprehensive process would significantly contribute to delivering successful innovative products to the defence markets.

Innovative ideas will attract cash bonuses. Individuals or teams of employees at all levels are encouraged to submit new ideas for consideration.

Here is some useful advice:

- Why not consider coming out of your comfort zone to develop a cross fertilisation of ideas?
- Use honest feedback to channels change
- Find your unique idea. Having found it, why not openly explore it with colleagues?

Back To Table of Content

INCOSE MEMBER BENEFIT: 15% DISCOUNT ON NAFEMS TRAINING

As a valued INCOSE member, you are eligible for a 15% discount on NAFEMS training opportunities.

NAFEMS is the International Association for the Engineering Modelling, Analysis, and Simulation Community. They are a non-profit established in 1983 that promotes best practices and collaboration in engineering simulation techniques. Their training courses cover a wide range of topics, including:

- Finite Element Analysis (FEA)
- Computational Fluid Dynamics (CFD)
- Multiphysics Simulation
- Optimization
- Practical Modelling of Joints & Connections
- Turbulence Modelling
- Stress Analysis
- And more!

These courses can help you improve your engineering skills, learn new simulation techniques, increase your productivity, and gain a competitive edge.

To take advantage of this exclusive INCOSE member discount, simply enter the INCOSE discount code when registering for a NAFEMS training course.

You can find the code on the NAFEMS Discount page on the iNET.

You can find more information about NAFEMS training courses on their training website.

We encourage you to take advantage of this valuable benefit and invest in your professional development!

Back To Table of Content

NOT FOR WOMEN ONLY FALL 2024

By Heidi Hahn

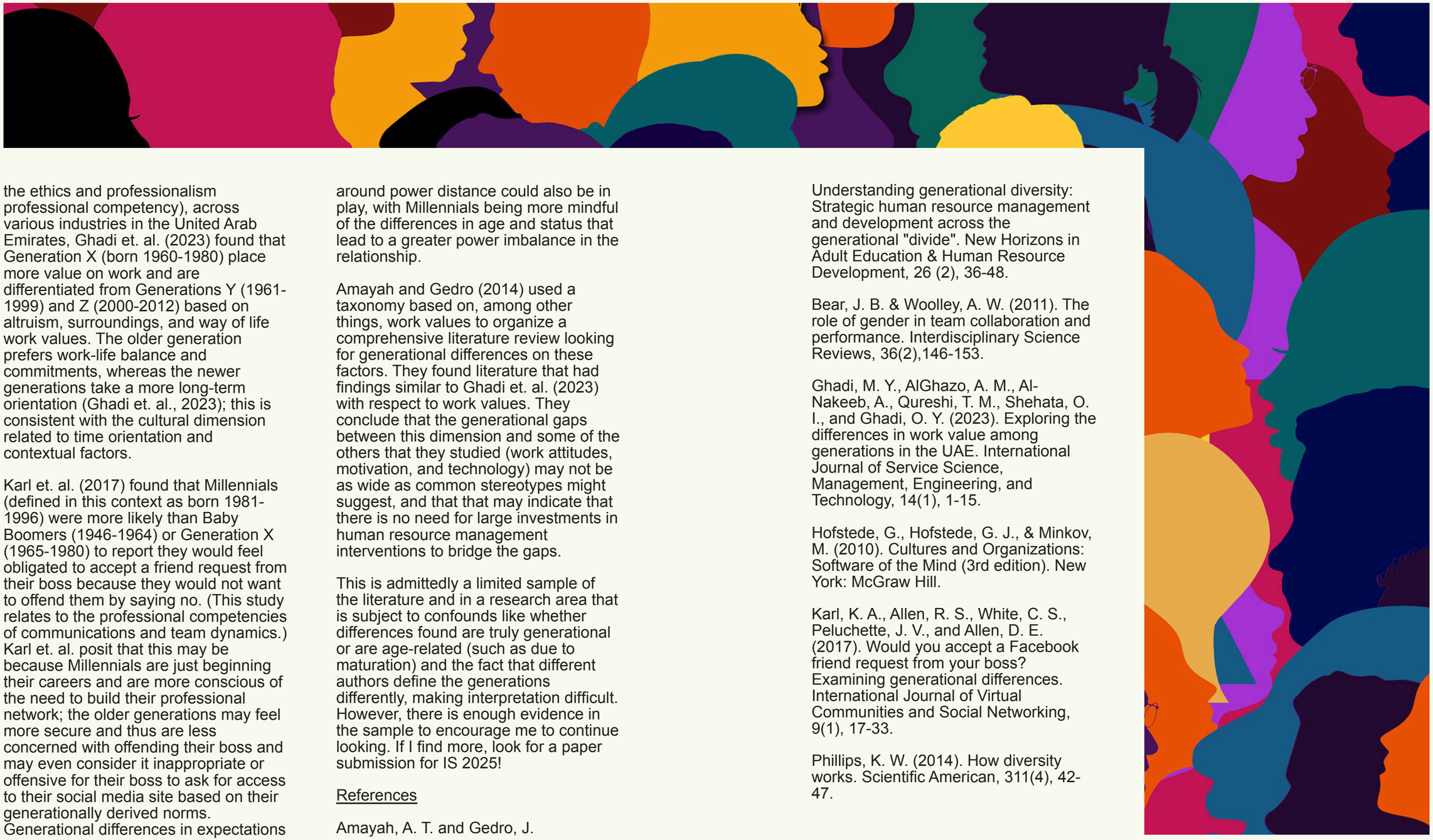
At IS2024, I presented a paper that looked at cultural differences in the eight INCOSE Professional Competencies (Communications, Team Dynamics, Ethics and Professionalism, Technical Leadership, Coaching and Mentoring, Negotiation, Facilitation, and Emotional Intelligence). Specifically, I was interested in whether these differences could be explained by Hofstede, Hofstede, and Minkov's (2010) cultural dimensions (individualism vs collectivism, uncertainty avoidance, indulgence vs restraint, monochromic [high context] vs polychromic time orientation or short vs long-term time orientation, power distance, and masculinity vs femininity). I was also interested in what implications cultural differences would have for selecting systems engineers or for forming and developing systems teams.

The short answer to the question about Hofstede is yes, cultural differences in each of the Professional Competencies can be explained by at least one, and often more than one, of the cultural dimensions. Cultural differences in preferences for individualism vs collectivism and tolerance for large power distance were the main drivers, but all of the dimensions played some role.

And, there are definitely plenty of implications from the literature on cultural differences to suggest strategies for selecting systems engineers and for forming and developing systems teams. Here are just a few: Teams should be diverse with respect to gender, race, and culture because diversity in teams enhances creativity by introducing informational diversity (Phillips, 2014) and leads to better group processes (Bear and Woolley, 2011). The position descriptions used when recruiting and selecting systems engineers should be gender- and culturally-neutral with respect to the value placed on masculine agentic styles versus feminine communal styles, preferences for power distance, and individualism over collectivism (or vice versa). Ditto for interview questions. Further, team members need to be educated about both gender and cultural diversity-related differences in communication and leadership styles; unconscious bias; the need to avoid stereotyping individuals based on gender, cultural, or racial characteristics; and the need to be conscious of the use of time and space when interacting with others.

At the conclusion of my presentation, I was asked whether I knew if the Hofstede, Hofstede, and Minkov (2010) cultural dimensions could be used to explain generational differences in team members' behavior relative to the professional competencies or to provide insights into how to manage cross-generational teams. I have only just started my literature review but I am cautiously optimistic that generational differences in approaches to the professional competencies will be explained, at least in part, by some of the same dimensions that describe the culturally-based differences.

In a study of work values, which are defined as standards, principles, and the importance of work itself and of work-related issues from the employee's point of view (which to me sounds similar to



the ethics and professionalism professional competency), across various industries in the United Arab Emirates, Ghadi et. al. (2023) found that Generation X (born 1960-1980) place more value on work and are differentiated from Generations Y (1961-1999) and Z (2000-2012) based on altruism, surroundings, and way of life work values. The older generation prefers work-life balance and commitments, whereas the newer generations take a more long-term orientation (Ghadi et. al., 2023); this is consistent with the cultural dimension related to time orientation and contextual factors.

Karl et. al. (2017) found that Millennials (defined in this context as born 1981-1996) were more likely than Baby Boomers (1946-1964) or Generation X (1965-1980) to report they would feel obligated to accept a friend request from their boss because they would not want to offend them by saying no. (This study relates to the professional competencies of communications and team dynamics.) Karl et. al. posit that this may be because Millennials are just beginning their careers and are more conscious of the need to build their professional network; the older generations may feel more secure and thus are less concerned with offending their boss and may even consider it inappropriate or offensive for their boss to ask for access to their social media site based on their generationally derived norms. Generational differences in expectations around power distance could also be in play, with Millennials being more mindful of the differences in age and status that lead to a greater power imbalance in the relationship.

Amayah and Gedro (2014) used a taxonomy based on, among other things, work values to organize a comprehensive literature review looking for generational differences on these factors. They found literature that had findings similar to Ghadi et. al. (2023) with respect to work values. They conclude that the generational gaps between this dimension and some of the others that they studied (work attitudes, motivation, and technology) may not be as wide as common stereotypes might suggest, and that that may indicate that there is no need for large investments in human resource management interventions to bridge the gaps.

This is admittedly a limited sample of the literature and in a research area that is subject to confounds like whether differences found are truly generational or are age-related (such as due to maturation) and the fact that different authors define the generations differently, making interpretation difficult. However, there is enough evidence in the sample to encourage me to continue looking. If I find more, look for a paper submission for IS 2025!

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Back To Table of Content

INCOSE'S LATEST TECHNICAL PRODUCT RELEASE: THE GUIDE TO SECURITY NEEDS AND REQUIREMENTS

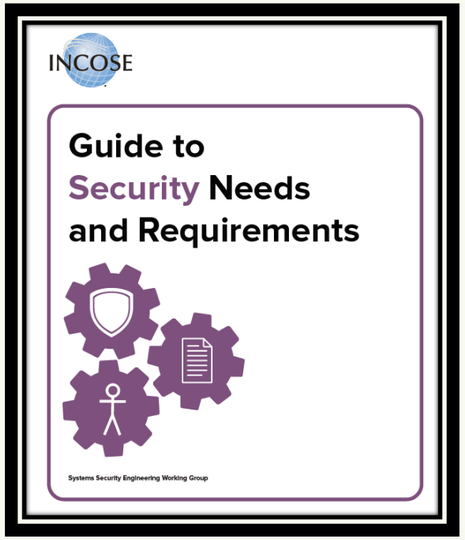
Defining clear and comprehensive security needs and requirements is essential for developing secure systems. However, stakeholders often struggle to articulate these needs in a way that can be translated into actionable requirements.

The Guide to Security Needs and Requirements provides systems engineers with practical approaches for developing security needs and requirements throughout a system's lifecycle. It aligns security concepts with INCOSE's existing needs and requirements frameworks, offering guidance on:

- Conducting loss-driven security analysis
- Defining well-formed security needs and requirements
- Transforming security needs into design requirements
- Verifying and validating security aspects
- Ensuring sustainable security post-deployment

The guide maps security terminology to standard systems engineering processes, enabling better integration of security considerations from concept to operation. It is an essential resource for systems engineers seeking to build security into complex systems from the ground up.

Go to the INCOSE Store to download the guide today!



Back To Table of Content

NEW SE LAB TOOL VENDORS

INCOSE is excited to announce our newest SE Lab Tool Vendors: Ansys, TraceCloud, and DENTSU SOKEN!

Ansys is a leader in engineering simulation, providing high-performance software that empowers engineers to develop innovative products and solutions. The SIX advanced tools they've added to our SE Lab will be a game-changer for our membership, enhancing capabilities in modeling, simulation, workflows, embedded software, twin building, and analysis.

Here's a closer look at the tools now available to INCOSE members:

- **Ansys SAM**: Evaluate the future of system architecture modeling with the new cloud-native SysML v2 tool. Ansys SAM enables users to create, analyze, and refine complex system models in a collaborative and scalable environment.
- **Ansys ModelCenter**: This vendor-neutral software framework facilitates the creation and automation of multi-tool workflows, optimizing product designs and enabling robust MBSE practices. ModelCenter seamlessly integrates various engineering tools, enhancing productivity and innovation.
- **Ansys Scade One**: The latest version of Ansys's model-based software, Scade One, is tailored for developing safety-critical embedded software. Its capabilities ensure that your software development process meets the highest safety standards.
- **Ansys medini analyze**: Implement critical safety, reliability, and cybersecurity analysis methods based on SysML with medini analyze. This tool ensures that systems meet stringent safety and reliability requirements.
- **Ansys Twin Builder**: Create comprehensive virtual prototypes of real-world systems with Twin Builder. This tool supports the entire product lifecycle, from design to deployment, providing valuable insights and management capabilities.
- **Ansys Systems Toolkit (STK)**: A dynamic physics-based, multi-domain modeling, simulation, and analysis environment, STK enables engineers to connect modeling and simulation efforts across all phases of the product lifecycle. Collaborate

effectively and drive innovation with this powerful tool.

All these tools are developed with Ansys's open architecture philosophy, ensuring they are standards-based and open concerning models, data, and APIs. This openness facilitates integration, flexibility, and customization to suit the unique needs of your projects.

TraceCloud
Requirements & Traceability

Collaboration, Change Management, and Change Propagation are critical for the success of any complex project. If you are trying to manage your project's requirements using Excel and Word documents, then you are aware of the challenges of managing a large project. For example, Lack of version control, Ensuring approval for the changes, Identifying dangling and orphan requirements, identifying & resolving changes and ensuring change flows through the traceability chain, and finally being able to produce end-to-end traceability reports.

TraceCloud is a SaaS Requirements Management and Traceability solution that addresses these problems. You can configure your project's structure to map to your Requirements Management Plan. TraceCloud is fully configurable and lets you define your Requirement Types, Attributes, Folders, Roles, Traceability rules, Approval Workflow, and custom reports.

It is designed to encourage collaboration and is a single source of truth for your extended team.

Built-in dashboards make it easy for your team to identify Dangling, Orphan, Suspect, and Incomplete requirements at Folder, Release, and Project levels.

電通総研
DENTSU SOKEN INC.
iQUAVIS

iQUAVIS is an integrated systems engineering support tool developed by DENTSUSOKEN for product system modeling, quality/risk analysis, and project management. iQUAVIS supports complex system modeling by visualizing technology, quality and risk analysis such as FMEA and DRBFM by visualizing tasks for decisions, and project management. All the tasks that need to be considered can be defined from the system model. Tasks impacted by changes can be automatically picked up, making it possible to understand project progress in real time for each management level.

The SE Lab is an exclusive online environment provided by INCOSE that allows members to access and use third-party vendors' systems engineering tools. These full-version products are intended for non-commercial use related to INCOSE activities and provide a platform for members to gain experience with industry-standard systems engineering tools without having to purchase them individually.

Visit the SE Lab today to try these new tools!

Back To Table of Content

SAMPLE ESEP INTERVIEW QUESTIONS NOW AVAILABLE

By Courtney Wright, INCOSE Certification Program Manager

Expert Systems Engineering Professional (ESEP) candidates love that they do not have to take the INCOSE knowledge exam. Multiple-choice questions are hard for experts, because they can think of an exceptional case to justify many answers that the INCOSE handbook would classify as "wrong." They have a proven history of assignments that show they know what systems engineering is, so INCOSE does not assess them using a standardized test.

Instead, ESEP candidates are assessed based on their work experience - confirmed by references – and by their technical leadership and professional development activities. They'll document these leadership and development in their application, and they'll also talk about it in their interviews. The ESEP interview is nothing like the knowledge exam; it is not an oral assessment of knowledge. Rather, it is more like essay questions about the candidate's specific experiences.

Speaking of "essay" questions, the ESEP interview may be performed either in writing or orally. Once ESEP candidates submit their full application and references, they will be sent a copy of the questions for their specific

Photo: ESEPs John Vantuno, Mike Celentano, Fred Robinson, Courtney Wright, Gan Wang, and Dave Walden at the 2024 Healthcare Working Group Conference in Minneapolis, MN, USA

interview. They are given a chance to answer the questions in writing. If the reviewers want more information, they will have an oral interview to address any gaps. The Certification Program tested this approach last year and found it to be equally effective at building reviewers' confidence in candidates' knowledge, while being even more effective in capturing shortfalls and justifying denials.

There are multiple changes taking place this year related to ESEP interviews. First, the interviews may be submitted in writing over a period of days rather than orally over a period of minutes. This is a psychological and functional advantage for candidates who are less confident in their responses to questions asked orally in English. Non-native English speakers who were reluctant to apply previously are now more comfortable that they will not be held back by their English language skills. Candidates may use translation software on the questions and their answers, something they couldn't easily do before.

Second, a sample set of possible interview questions is now published. Some candidates have reported no surprises when seeing the sample questions, but for others these samples are a way of level-setting their expectations. Different cultures ask different types of interview questions, and by listing these we are both removing uncertainty and providing focused direction. A candidate who does not have good answers to this sort of question can select to hold off on applying for ESEP until they have gathered additional experiences and perspectives that will prepare them.

Transmitting questions in writing increased the risk of questions being shared inappropriately. By sharing them openly, INCOSE is mitigating that risk. The ESEP Certification Application Reviewers (CARs) feel confident in their ability to fairly assess global candidates on their systems engineering leadership and professional development based on the combination of their application, references, and written or oral interview questions.

To learn more about what it means to be an ESEP, check out this webinar from David Ward, ESEP, and Courtney Wright, CSEP.

If you could go back to your first engineering job with your current systems engineering knowledge, what would you do differently? What effect would it have on that project?

When a subject matter expert who is not experienced in systems engineering is put in the role of Chief Engineer, what do you expect will be the most challenging for them?

Back To Table of Content

CALLING ALL SYSTEMS: "ACCELERATING MBSE ADOPTION: CAN SYSMLV2 BE THE GAME CHANGER?"

Join INCOSE for the next Calling All Systems episode on 23 October, 2024 at 11:00 (EST)!

Session Topic

This panel discussion will explore the potential of SysMLv2 to drive the widespread adoption of Model-Based Systems Engineering (MBSE). Focusing on SysMLv2's key advancements—enhanced usability, greater precision and expressiveness, and seamless integration—we will explore how these features might simplify MBSE processes and address real-world engineering challenges. We will discuss the transition strategy being developed by both government and industry to enable enterprises and practitioners alike to reduce the learning curve, increase efficiency, and support broader MBSE adoption across industries. Join us as we assess the role SysMLv2 could play in accelerating your organization's transition to more efficient, model-based systems engineering practices.

Meet the Host

Daniel Siegl has been promoting, building, and contributing to the standardization of model-based engineering tools since 1999. ProStep, OpenMBEE, INCOSE (Assistant Director for Standards), and OMG are only some of the international model-based systems engineering community organizations that profit from Daniel's continued involvement. Daniel has been a key player at LieberLieber, the Company behind LemonTree, since 2006. He lives with his family near Vienna, Austria.

For more information, including the panelists' bios and how to register for the session, visit INCOSE's Calling All Systems webpage.

If you are interested in being a session host or panelist for a future Calling All Systems episode, contact forum@incose.net.

INCOSE Members Newsletter

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- Q2 2024 Newsletter: 15 May 2024
- Q3 2024 Newsletter: 15 August 2024
- Q4 2024 Newsletter: 15 November 2024

For further information on submissions and issue themes, visit the INCOSE MarCom website: www.incose.org/marcom

Who are we?
INCOSE is a 25,000+ member organization of systems engineers and others interested in systems engineering. Its mission is to share, promote, and advance the best of systems engineering from across the globe for the benefit of humanity and the planet. INCOSE charters chapters worldwide, includes a corporate advisory board, and is led by elected officers and directors.
All views expressed in this Newsletter are the writers' own and do not reflect the views of INCOSE.

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Back To Table of Content

A Better World Through a Systems Approach

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