



IEEE ISSE 2025

11th IEEE International Symposium on Systems Engineering
ENSTA, Paris, France | **October 28-30, 2025**

IEEE International Symposium on Systems Engineering SYMPOSIUM PROGRAM

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General Chair's Message



It is our pleasure and our honor to host the IEEE ISSE 2025 for the 20th anniversary of the IEEE Systems Council in ENSTA, Paris.

From the very beginning this event has been architected to facilitate the exchanges, experiences and knowledge sharing of those involved in system engineering worldwide who however are not part of the same communities. Therefore the main international bodies in system engineering, INCOSE, IEEE with the IEEE System council and NATO have been invited to contribute whether through Keynote speakers, special session for the French INCOSE Chapter AFIS and for the authors who did not usually participate in this event. We are glad that all responded positively to this vision.

The system engineering community in France is rich, diverse and dynamic both in industry and academia. It has strong international relations and cooperations worldwide and is very much involved in the advancement of theoretical foundations, international standards, products and services for system engineering. ISSE is therefore an opportunity to share this ecosystem with guests worldwide.

The choice of ENSTA as the venue of the event has been rooted in the same objective of sharing the rich ecosystem of Plateau de Saclay where world class top companies and higher education institutions are located. ENSTA Paris, officially École nationale supérieure de techniques avancées is a French graduate school of engineering (école d'ingénieurs) under the authority of the French ministry of defense and DGA. Founded in 1741, it is the oldest grande école in France. It is located on the Paris-Saclay campus, and is a constituent faculty of the Polytechnic Institute of Paris.

I would like to thank Andy Chen as president of the IEEE Systems council, Paolo Carbone as VP conferences and the technical program chairs Amir Aghdam, Alejandro Salado and Rob Vingerhoeds for their cooperation and their support as well as the local organizing committee and ENSTA for its support.

We look forward to an enriching and memorable symposium, and we thank you for joining us in this exciting chapter of systems engineering's ongoing evolution.

Omar HAMMAMI
General Chair, IEEE ISSE 2025
Professor, ENSTA



On behalf of the IEEE Systems Council, it is my distinct honor to welcome you to the 2025 IEEE International Symposium on Systems Engineering (IEEE ISSE 2025), held in the magnificent city of Paris, France. Renowned for its timeless elegance, rich history, and vibrant culture, Paris offers an inspiring backdrop for this prestigious gathering.

Now in its 14th edition, IEEE ISSE continues to serve as the flagship European conference of the Systems Council. While the idea of hosting the symposium in Paris has been considered for over a decade, formal planning commenced in June 2024. Thanks to the dedication and resilience of our organizing committee supported by Program Chairs: Amir Aghdam, Alejandro Salado and Rob Vingerhoeds, this year's symposium promises to be a dynamic and high-impact forum for researchers, engineers, practitioners, and educators to share cutting-edge research, explore industrial practices, and shape the future of systems science and engineering.

Following the success of IEEE ISSE 2024 in Perugia, Italy, the local organizing team at ENSTA (Institut Polytechnique de Paris), led by Mr. Omar Hammami, has worked tirelessly to ensure every detail of the conference is executed with precision and care. Mr. Hammami has also played a pivotal role in securing sponsorships and fostering collaboration with The International Council on Systems Engineering (INCOSE), further enriching the scope and reach of this event.

This year also marks a significant milestone—the 20th anniversary of the IEEE Systems Council. Since its founding in 2005, the Council has been a driving force in advancing systems engineering and promoting interdisciplinary collaboration across the globe.

We look forward to an enriching and memorable symposium, and we thank you for joining us in this exciting chapter of systems engineering's ongoing evolution.

Andy Chen
General Chair, IEEE ISSE 2025
President, IEEE Systems Council

Technical Program Chair's Message

It is our great pleasure to welcome you to the 2025 IEEE International Symposium on Systems Engineering in Paris. Thanks to the strong support of our General Chair, Omar Hammami, the dedicated efforts of Sara Diffenbach from Conference Catalysts, and the continued support of the IEEE Systems Council—led by President Andy Chen and Vice President for Conferences Paolo Carbone—we are pleased to present an engaging, high-quality program. It has been both a privilege and a joy to collaborate with them in organizing this event.

The technical program features 119 peer-reviewed papers, each evaluated by at least two experts, covering a wide range of topics in systems engineering. These contributions address both fundamental research questions and practical challenges of interest to the systems engineering community, including academics and practitioners alike. We are deeply grateful to our anonymous reviewers, whose careful assessments ensured the quality of the program. In addition, we are excited to host 7 keynote lectures, on emerging topics with promising applications.

We look forward to welcoming you in person to Paris. We hope this symposium will be a productive and inspiring experience, offering new ideas for research and fostering meaningful collaborations, as well as new friendships within our community.

Amir Aghdam, Alejandro Salado and Rob Vingerhoeds
2025 IEEE International Symposium on Systems Engineering (ISSE) Technical Program Chairs



Keynote Speakers

Luc Dini
Tuesday, October 28
8:40 – 9:30



Luc Dini is Graduated Engineer in Aeronautics, skilled in radars, hyperfrequency, missiles and space (ISAE-ENSICA 1984).

Former auditor of the IHEDN-SNAED (44th Defense Economy National Session French of Institute for Defence and Security) and of IHEDN Economic Intelligence Session (2017) – Reserve Officer (armament-citizen reserve) in the French DGA- Emerite member of Association Aéronautique de France (3AF)- co chair of the 3AF International Conference on IAMD since 2008. Member of the Multinational BMD Conference IPC (NDIA) since 2006.

Luc Dini is a former military engineer (MoD, DGA). He had been manager of development R&T program for countermeasures systems and ballistic missiles phenomenology and testing. He participated to cooperation projects, including scientific cooperation with the US SDIO and the Air Force Geophysics Laboratory on high atmosphere radiation physics. He served one year as firing officer on SHORAD system in the French Air Force.

He joined Thales in 1991 he has been project manager of SHORADs project. He is Director of IAMD and Theater Defense Solutions Product Line including SAMP/T NG Long range weapon system since 2016. Luc Dini has been chairing a NATO NIAG study on standards of IAMD multisensors fire control clusters of systems networking since 2017.

Luc Dini has delivered numerous articles and conferences on IAMD.

Sven-Olaf Schulze
Tuesday, October 28
13:30 – 14:10



Sven-Olaf Schulze is currently serving as EMEA Sector Director in the Board of the International Council on Systems Engineering (INCOSE) since 2021. Sven-Olaf is an active member in the German Chapter of INCOSE (GfSE) since 2003 and served as president GfSE from 2009 until 2019.

Sven-Olaf holds a diploma in Aerospace and Space from the Technical University of Braunschweig (TuBS) with a focus on aircraft structure and light weight design and he is a Certified Systems Engineer Professional (CSEP) and SE-ZERT® Level A. From 2007 to 2012 he was a lecturer at the University of Applied Sciences in Hamburg for the subject of Systems Engineering. For 5 years he was appointed to the committee of the UEEIV (Union of European Railway Engineer Associations) in the field of certification "Railway Systems Engineers". He is the author of systems engineering articles, papers and co-author of books on product development and systems engineering.

He has been working in the Airbus space/aerospace industry since 1996 with project responsibilities in Ariane 4, Ariane 5, ISS, MIR, Airbus A380 and A400M and introduced Systems Engineering as Vice President SE at Suzlon Energy GmbH before he joined UNITY Consulting AG as Principal for Digitization, Innovation, SE and Product Development.

Today he is the Managing Director of LEIxCOn, an engineering consulting company with a focus on Systems Engineering and Integrated Product Support (IPS/ILS/RAMS) to improve the development processes and approaches with customers across industries.

Lionel Khimeche
Wednesday, October 29
8:30 – 9:30



Lionel KHIMECHE is leading M&S for acquisition strategy in charge to develop the DGA (Direction Générale de l'Armement) M&S Master Plan and M&S Standard Profile. His role deals mainly to provide for technical DGA test, evaluation and expertise centers the required guidelines, resources repository and common frameworks to develop simulations for acquisition to support program of records. His previous appointment as an R&T Manager was to provide Armed Forces with M&S systems to improve Forces readiness and Support to Operations. He is currently the French NATO M&S Group (NMSG) National member and the NATO M&S Standards Subgroup (MS3) chair, which aims to guide the production, maintenance and management of NATO M&S standardization documents and terminology. In addition, Lionel Khimeche is a member of the Simulation Interoperability Standards Organization (SISO). Many of his scientific papers were granted with SIWzie Awards.

Keynote Speakers

General Dominique Luzeaux
Wednesday, October 29
13:30 – 14:10



Dominique Luzeaux (Dr. Hab., Ph.D., B.E., B.Sc.) graduated from École Polytechnique (1987) and École Nationale Supérieure des Techniques Avancées (1989) as an armament engineer. His first position was a research engineer in artificial intelligence and robotics. He defended his PhD thesis at University of Paris XI (1991) and was a visiting postdoctoral research scientist at University of California Berkeley (1991-1992). Within the French Ministry of Defense, he occupied various positions successively as expert, project manager and director, in the domains of Complex System Engineering, Information Systems, C4ISR systems, and Land Systems. From 2021 to 2023, he was Director of the newly created Digital Defense Agency within the French Ministry of Defense, in charge of defense complex digital projects. He joined NATO's Allied Command Transformation in Norfolk Virginia in December 2023, as Digital Transformation Champion and Special Advisor to the Supreme Allied Commander for Transformation. He holds rank of Major General. Besides, he defended in 2001 his habilitation thesis, directed a dozen PhD students, published around hundred articles in conferences and international journals, has written 10 books in French and English on nanotechnology, on simulation, on complex systems and systems of systems engineering, and on digital public debates. He received the "Ingénieur Général Chanson" Award in 2006 for his work on military autonomous unmanned ground vehicles.

Cedric Brun
Wednesday, October 29
18:00 – 21:00



Cédric Brun is the CEO of Obeo, a company he first joined as an intern and has since helped grow into a recognized international player in model-driven engineering. Throughout his career, he has focused on advancing modeling technologies to support the design and understanding of complex systems. Active in the Eclipse community since 2006, he has served as committer, project lead, and mentor. He spearheaded the creation of Eclipse Sirius, a widely adopted open-source framework that enables the development of tailored modeling tools used by engineers and researchers worldwide. His work has been applied across aerospace, defense, transportation, and other mission-critical domains, bridging academic innovation with industrial impact.

As CEO, Cédric champions a collaborative leadership style and promotes the development of open-source technologies as enablers of sovereignty, transparency, and long-term sustainability in engineering. His vision is to empower architects and engineers to tackle the challenges of large-scale, safety-critical systems with confidence and agility.

Asma Smaoui
Wednesday, October 29
18:00 – 21:00



CEA Expert in System Design. PhD, more than 15 years experiences in MBSE: Model Based System Engineering domain. worked in several research organisms at France: CEA, INRIA, Thales... Involved in several industrial projects to promote MBSE with known industrial partners such as Renault, Ericsson, RTE, ... Her research domains are mainly system design, model compilation, execution and code generation. Recent researches of Asma are focused on DSML for different domain: Smart Grids, Manufacturing, Safety of complex system as well as modeling standards like SysMLv2, AAS for Digital Twin, RAAML for Risk Analysis and ASAM standards for Automotive domain.

Keynote Speakers

Maarten Bonnema
Thursday, October 30
8:30 – 9:30



G. Maarten Bonnema is a Full Professor of Systems Engineering and Multidisciplinary Design (SEMD) at the Faculty of Engineering Technology at the University of Twente in The Netherlands. He holds a Master of Science in Electrical Engineering, an Engineering Doctorate in Technical Systems Design, and a PhD in Systems Architecting. He has (co-)authored over 100 peer reviewed articles in the field of Systems Engineering and Systems Design. The publications deal with subjects like communication in multidisciplinary collaboration; systems design methods; systems design tools; and systems thinking. His research, and that of the SEMD chair, has a strong design focus. The results are not only academically relevant, but are applied in industry, through the Industry as Laboratory research model. The energy transition, electrical mobility and the high-tech industry are focal points for applying his systems engineering research. He has a broad teaching expertise spanning design in general, industrial design engineering, and systems engineering at the bachelor, master, post-master and professional levels. In teaching, his industry experience as a Systems Engineer at ASML, and his involvement in other high-tech companies, play an important role in engaging the students. He was recognized as Fellow of the International Council on Systems Engineering (INCOSE) in 2024, “for enriching systems engineering with tools and lines of reasoning for designing system architectures and for educating systems engineers.”

Alan Harding
Thursday, October 30
13:30 – 14:10



Alan Harding is an experienced systems engineering leader, with 40 years of experience in defence and security domains. His specialist interest areas include systems-of-systems, architecture, sustainability, and competency development. Alan was the President of the International Council on Systems Engineering (INCOSE) in 2016 and 2017, and previously he led INCOSE UK (now known as IfSE) in 2013 & 2014. Alan was appointed a BAE Systems Global Engineering Fellow in November 2010, recognizing his professional expertise and activities promoting systems within the company and in the wider UK and international community. Alan has a BSc (Hons) in Physics from Hatfield College, Durham University, and is a Fellow of the Institute of Engineering and Technology (IET). Alan is also a Freeman of the Worshipful Company of Engineers. Alan has been co-chair of the INCOSE Systems of Systems Engineering Working Group since its inaugural meeting in January 2012, and this year also became co-chair of the newly established INCOSE Sustainability Working Group.

Special Session

Systems Engineering Research – Insights from the INCOSE French Chapter AFIS

Organizers:

Romain Piquié, Olivia Penas, and Vincent Chapurlat

Abstract:

This special session, organised under the auspices of the INCOSE French Chapter AFIS, highlights original research contributions from the French systems engineering community. As part of INCOSE's ongoing mission to advance the theory and practice of systems engineering, this session aspires to convene cutting-edge academic and applied research through collaboration among academia, industry, and government stakeholders. The session provides a unique platform for researchers affiliated with the INCOSE French Chapter to present new theories, methodologies, frameworks, tools, and case studies that address the complex challenges encountered in modern systems engineering. This special session represents an opportunity for researchers in systems engineering to showcase their work, engage with peers worldwide, and contribute to advancing the discipline. Researchers affiliated with the INCOSE French Chapter, or those who engage closely with its academic and industrial ecosystem, are particularly encouraged to participate in this session and leave a lasting impact on the global systems engineering landscape.

Program at a Glance

8:00 – 17:30 Registration Open (all days)	October 28 th				October 29 th				October 30 th			
	Amphitheatre R111	2234	2329	1.3.24	Amphitheatre R111	2234	2329	1.3.24	Amphitheatre R111	2234	2329	1.3.24
8:30 – 9:30	IEEE ISSE 2025 Opening 8:30 – 8:40 Amphitheatre R111				Keynote: Lionel Khimeche, DGA/FR MOD Amphitheatre R111				Keynote: Maarten Bonnema, University of Twente, NL Amphitheatre R111			
	Keynote: Luc Dini, THALES Air Systems, FR 8:40 – 9:30 Amphitheatre R111											
9:30 – 10:30	Session A1	Session B1	Session C1		Session A5	Session B5	Session 5C	Session 5D	Session A9	Session C9	Session B9	Session D9
10:30 – 11:00	Coffee Break Break Area				Coffee Break Break Area				Coffee Break Break Area			
11:00 – 12:30	Session A2	Session B2	Session C2	Session D2	Session A6	Session B6	Session C6		Session A10	Session C10	Session B10	Session D10
12:30 – 13:30	Lunch Break Area				Lunch Break Area				Lunch Break Area			
13:10 – 14:10	Keynote: Sven-Olaf Schulze, LEI/CON/INCOSE, D Amphitheatre R111				Keynote: General D. Luzeaux, NATO HQ, Norfolk, VA, USA Amphitheatre R111				Keynote: Alan Harding, INCOSE Amphitheatre R111			
14:10 – 15:50	Session A3	Session B3	Session C3	Session D3	Session B7		Session A7		Session A11	Session C11	Session B11	
15:40 – 16:00	Coffee Break Break Area				Coffee Break Break Area				Coffee Break Break Area			
16:00 – 17:30	Session A4	Session B4	Session C4	Session D4	Session B8	Session A8	Session C8	Session D8	Session A12	Session C12	Session B12	Session D12
18:00 – 21:00	Sponsor Cocktail 1 Break Area				Gala Dinner Keynote: Cedric Brun, Obeo and Asma Smaoui, CEA Best Paper Award Break Area				Sponsor Cocktail 2 Break Area			

Technical Program: Tuesday, October 28

8:30 - 8:40

IEEE ISSE 2025 Opening

Room: Amphitheatre R111

8:40 - 9:30

Keynote: Disruptive effects on IAMD: from threat complex to collaborative systems modes

Keynote Speaker: Luc Dini, Thales Air Systems, FR

Room: Amphitheatre R111

9:30 - 10:30

SA1: MBSE, SysML v.2.0

Room: Amphitheatre R111

9:30

Integrating Circular Strategies into Product Concept Design: a Proxy-Based LCA Approach Within the MBSE Framework

Eugenio Brusa and Chiara Gastaldi (Politecnico di Torino, Italy); Monica Hierro Magnet (Universitat Politècnica de Catalunya, Spain)

10:00

Enabling Product Lifecycle Impact Evaluation for MBSE by Coupling SysML 2.0 and BPMN 2.0

Carl-Philipp Grunenwald and Anton Dybov (Technische Universität Berlin, Germany); Rainer Stark (TU Berlin, Germany)

9:30 - 10:30

SB1: Healthcare

Room: 2234

9:30

Optimizing Healthcare Clinical Decision Support Systems: a Systems Thinking and Process Modeling Approach

Mohamed Mogahed and Anas Elahi (Stevens Institute of Technology, USA); Mo Mansouri (Stevens Institute of Technology & University of South-Eastern Norway, USA)

10:00

System-of-Systems Approach for Enhancing Deceased-Donor Kidney Recipient Selection Through Meta-Architecture Optimization

Oluseyi L Fadaiya (Missouri University of Science and Technology, USA & University of Missouri System, USA); Cihan H Dagli (Missouri University of Science and Technology, USA)

9:30 - 10:30

SC1: MBSE, SysML v.2.0

Room: 2329

9:30

SysML for the Rest of Us: Making Residential HVAC Systems Accessible to Non-Experts

Saber Ahmadnezhad Ghazimahalleh and Omid Razbani (University of South-Eastern Norway, Norway)

10:00

Bridging Requirements and Design in MBSE: Leveraging SysML v2 for Automatic Verification

Eugenio Brusa, Filippo Mazzoni and Cristiana Delprete (Politecnico di Torino, Italy); Camilo Andres Manrique-Escobar, Alberto Dagna and Grazia Accardo (Leonardo SpA, Italy)

10:30 – 11:00

Coffee Break

Room: Break Area

Technical Program: Tuesday, October 28

11:00 - 12:30

SA2: Model Based System Engineering 2

Room: Amphitheatre R111

11:00

Enhancing Model-Based Systems Engineering Through Integrated Reference Architectures: a Structured Approach for Industrial Systems

Christoph Binder and Katharina Polanec (Salzburg University of Applied Sciences, Austria); Jan Vollmar (Siemens AG, Germany); Sarah Riedmann (Salzburg University of Applied Sciences, Austria); Mergim Millaku (Salzburg University of Applied Sciences, Austria & Josef Ressel Centre for Dependable System-of-Systems Engineering, Austria); Christian Neureiter (Salzburg University of Applied Sciences, Austria)

11:30

Industrial Implementation of the MBSE Applied to Design of an Aircraft Landing Gear: Current Issues, Solutions and Tools

Eugenio Brusa, Cristiana Delprete and Alberto Dagna (Politecnico di Torino, Italy)

12:00

Early Model-Based Functional Integration Testing for Aircraft Systems Architectures Demonstrated on a Hydrogen-Powered Propulsion Unit

Nils Kuelper, Dennis Hillig, Jasmin Broehan, Lukas Stigge and Frank Thielecke (Hamburg University of Technology, Germany)

11:00 - 12:30

SB2: Generative AI and System Engineering

Room: 2234

11:00

Generative AI in Systems Engineering: Automated Creation of System Architectures and Early-Stage Calculation in the B2B Sector

Lynn Humpert (Fraunhofer IEM, Germany); Jannis Graunke (Fraunhofer Institut Entwurfstechnik Mechatronik IEM, Germany); Gerrit Cichon and Anuradha Ammanagi (Fraunhofer Institute for Mechatronic System Design, Germany); Anja Schierbaum (Fraunhofer Institut Entwurfstechnik Mechatronik IEM, Germany); Roman Dumitrescu (Fraunhofer-Einrichtung für Entwurfstechnik Mechatronik IEM, Germany)

11:30

Automating Automotive Software Development: a Synergy of Generative AI and Model-Based Methods

Fengjunjie Pan, YingLei Song, Long Wen, Nenad Petrovic, Krzysztof Lebioda and Alois Knoll (Technical University of Munich, Germany)

12:00

Leveraging AI to Enhance Systems Engineering Practices in Large-Scale Infrastructure Projects

Per Persson Schön (Chalmers University of Technology, Sweden & Swedish Transportation Administration, Sweden); Rim El-Haj, Dag Bergsjö and Blessing Osamwanze (Chalmers University of Technology, Sweden)

11:00 - 12:30

SC2: Model Based System Engineering 2

Room: 2329

11:00

Proposal for a Development Method for Rockets Based on Multi-Risk Assessment and Gradual System Architecture Definition

Takenori Maeda (Mitsubishi Heavy Industries, Ltd., Japan); Kohei Tanaka, Yoshiko Ohno and Seiko Shirasaka (Keio University, Japan)

11:30

A Model-Based Approach to Automotive Security Analysis: Cross-Domain Application of the Cybersecurity Toolbox

Simon Eschlberger, Katharina Polanec, Bernhard Braschel, Thomas Ploner and Christian Neureiter (Salzburg University of Applied Sciences, Austria)

12:00

Reframing Software Bill of Materials (SBOM) Security Evaluation Using a Model-Based Systems Engineering Approach

Teddy Nyambe and Jeremy Daily (Colorado State University, USA); Ben Manavi (IBM, USA); Sarah C Rudder (Colorado State University & Enola Technologies, USA)

Technical Program: Tuesday, October 28

11:00 - 12:30
SD2: Modeling
Room: 1.3.24

11:00
Intelligent Edge AI Framework for Foreign Object Detection and Power Optimization in WPT
Nakkeeran R (Center for Electric Mobility, India); C Bharatiraja (SRM, India); Sanjeevikumar P (University of South-Eastern Norway, Norway); Pawel Szczesniak (University of Zielona Gora, Poland); Freede Blaabjerg (Aalborg University, Denmark)

11:30
Digital Twins as Reflective Models in the Verification of Safety-Critical Complex Systems
Odd Ivar Haugen (DNV AS, Norway)

12:00
Operationalizing Healthcare Through HHS Mission-Driven Analysis and Functional Categorization for a Governable System of Systems
Mohamed Mogahed and Anas Elahi (Stevens Institute of Technology, USA); Mo Mansouri (Stevens Institute of Technology & University of South-Eastern Norway, USA)

12:30 – 13:30
Lunch
Room: Break Area

13:30 – 14:10
Keynote: Vision, Mission and the Hidden Drivers
Speaker: Sven-Olaf Schulze, LEI/CON/INCOSE, D
Room: Amphitheatre R111

14:10 - 15:40
SA3: AI and System Engineering
Room: Amphitheatre R111

14:10
Model-Based AI-Driven Systems Engineering (MBSE-AI): Towards Fast and Effective Decisions
Zakka Ugih Rizqi (Aalborg University, Denmark & Novo Nordisk, unknown); Ole Madsen, Casper Schou, Bjørn Christian Dueholm, Tristan Schwörer and Martin Bieber Jensen (Aalborg University, Denmark); William Henrik Flach de Neergaard and Kasper Barslund Hansen (Technical University of Denmark, Denmark); Oline Vinter Olesen (Novo Nordisk, Denmark)

14:40
AI-powered integrated platform for multi-stakeholder systems engineering and project management
Ozge Türkoğlu (Company, Turkey & Aselsan, Turkey); Oguz Gorkem Aslankoc (Aselsan, Turkey)

15:10
Towards an AI-Enabled Signal Optimization Methodology in Vehicle Architecture Models
Mahmoud Bazzal (Heinz Nixdorf Institute, Paderborn University, Germany & AUDI AG, Germany); Adriana Lungu (AUDI AG, Germany); Benjamin Kruse (Audi AG, Germany); Christian Koldewey (Heinz Nixdorf Institute / Paderborn University, Germany); Roman Dumitrescu (Heinz Nixdorf Institute, University of Paderborn, Germany)

14:10 - 15:40
SB3: Safety
Room: 2234

14:10
Towards the Application of Knowledge Graphs in Model-Based Safety Assessments
Zvonimir Lipšinić (University of Zagreb, Croatia); Faizan Faheem and Stephan Husung (Technische Universität Ilmenau, Germany); Neven Pavković (University of Zagreb, Croatia)

14:40
Constellation-Level Variability Modeling for Safety Constraint Refinement in System of Systems
Julieth Patricia Castellanos Ardila and Sasikumar Punnekkat (Mälardalen University, Sweden); Nazakat Ali (Mälardalens University, Sweden)

15:10
Process Mining-Informed Petri Net Simulation for Cost-Effectiveness Analysis in Health Systems
Shiva Faeghinezhad and Hendrik Koffijberg (University of Twente, The Netherlands)

Technical Program: Tuesday, October 28

14:10 - 15:40

SC3: AI and System Engineering

Room: 2329

14:10

LLM-Assisted Semantic Alignment and Integration in Collaborative Model-Based Systems Engineering Using SysML v2

Zirui Li (Technische Universität Ilmenau, Germany); Stephan Husung (Technische Universität Ilmenau, Germany); Haoze Wang (Technische Universität Ilmenau, Germany)

14:40

Generating SysML v2 Models from Natural Language Requirements Using Large Language Models

Simon Dehn, Simon Schnürer and Georg Jacobs (RWTH Aachen University, Germany); Gregor Hoepfner (MSE, RWTH Aachen, Germany)

15:10

Integrating SysML v2 into a GRAG LLM Pipeline: Design, Implementation and Evaluation

Elias Bader (Salzburg University of Applied Sciences, Austria & JRZ DeSoS, Austria); Jounes-Alexander Gross DI (University of Applied Science Salzburg, Austria); Katharina Polanec, Markus Michael Peter and Christian Neureiter (Salzburg University of Applied Sciences, Austria)

14:10 - 15:40

SD3: Modeling 2

Room: 1.3.24

14:10

Enabler-Based Systems Architecture for Circular Airline and Airport Waste Management: a Dual Systematic and Grey Literature Review

Steny Ann Sabu (Khalifa University, United Arab Emirates); Vikas Swarnakar (Khalifa University of Science and Technology, Abu Dhabi, UAE, United Arab Emirates); A. Acquaye, Abdelrahman E. E. Eltoukhy and Malik Khalfan (Khalifa University, United Arab Emirates)

14:40

Lifecycle Modeling for Incremental Safety Assurance

Vitus A Lüntzel, Muhammad A Minhas, Maximilian Beck and Eric Sax (Karlsruhe Institute of Technology, Germany)

15:10

Adaptability and Resilience Metrics for Complex Adaptive Systems

Kenneth Cureton (University of Southern California, USA); Haifeng Zhu (BAE Systems, USA); John Brtis (INCOSE, USA); Eileen Patrice Arnold (United Technologies Corporation Retired, USA); Scott Jackson (Burnham Systems, USA)

15:40 – 16:00

Coffee Break

Room: Break Area

16:00 - 17:30

SA4: Applications

Room: Amphitheatre R111

16:00

Journey Under the Water: Uncovering and Improving Systems Engineering and Software Engineering Interplay

Alexandr Vasenev and Richard M P Doornbos (TNO, The Netherlands); Pieter Goosen and Joana Teixeira (TNO-ESI, The Netherlands); Laura Van Veen (TNO, The Netherlands); Johan J. Lukkien (Eindhoven University of Technology, The Netherlands)

16:30

A Digital Hybrid Pipeline for Energy-Aware CNC Machining: Surrogate Models Leveraging CAM and G-Code Data

Nourhene Kharrat Abdeljabbar (ISAE-SUPMECA, France); Moncef Hammadi (ISAE-SUPMECA & Quartz Laboratory EA7393, France)

17:00

From Regulation to Realisation: Architecting a Digital Battery Passport System

Ruben Camiel Baljon, Natansh Vyas and Omid Razbani (University of South-Eastern Norway, Norway)

Technical Program: Tuesday, October 28

16:00 - 17:30
SB4: Applications 2
Room: 2234

16:00

Systems Architecting in Railway Signaling: Bridging Legacy Yard Signaling Systems with European Rail Traffic Management System

Johan Stekelenburg (University of Twente, The Netherlands & ProRail BV, The Netherlands); Roberto Reyes Garcia and G. Maarten Bonnema (University of Twente, The Netherlands)

16:30

Exploration of Evolving Quantum Key Distribution Network Architecture Using Model-Based Systems Engineering

Hayato Ishida (Loughborough University, United Kingdom (Great Britain) & Loughborough Quantum Systems Engineering, United Kingdom (Great Britain)); Amal Elsokary and Maria Aslam (Loughborough University, United Kingdom (Great Britain)); Catherine White (British Telecom plc, United Kingdom (Great Britain)); Michael Henshaw and Siyuan Ji (Loughborough University, United Kingdom (Great Britain))

17:00

Towards a Modular IoT System Architecture for Rural Aqueducts Using Model Based Systems Engineering

Juan José Montero-Jiménez (Tecnológico de Costa Rica, Costa Rica); Juan J. Rojas (Instituto Tecnológico de Costa Rica, Costa Rica); Anthony José Arguedas-Rodriguez and María José Angulo-Campos (Tecnológico de Costa Rica, Costa Rica)

16:00 - 17:30
SC4: Applications 3
Room: 2329

16:00

Addressing Challenges and User Concerns to Enhance Electric Vehicle Confidence in Saudi Arabia

Saleh Alotaibi (Saudi Standards, Metrology, and Quality Organization (SASO)); Siddig Omer (University of Nottingham, United Kingdom (Great Britain)); Sulaiman Aljarallah (Technical and Vocational, Training Corporation (TVTC), Saudi Arabia); Wael Altheyab and Ali Alzaidan (Saudi Standards, Metrology, and Quality Organization (SASO), Saudi Arabia); Saleh Alsamdani (Communications, Space and Technology Commission, Saudi Arabia)

16:30

Low-Cost Solar Powered Real Time AI-Driven Vehicle for Security Applications

Mohammed Yaseen Al-Nuaimi and Omar Saadallah Abdulwahid (University of Mosul, Iraq); Maher Al-Greer (Teesside University, United Kingdom (Great Britain))

17:00

Ontology Enhanced Gaia-X Compliant Marketplace of Digital Twins for the Energy Sector

Thomas Achim Schmeyer (German Research Center for Artificial Intelligence, Germany); Boris Brandherm (Deutsche Forschungszentrum für Künstliche Intelligenz GmbH, Germany); Kai Krämer (Saarland University, Germany); Anna-Lena Peh and Daniel Rohrbach (Fraunhofer IOSB, Germany); Stefan Kilb (Schneider Electric, Germany); Alexander Schalk (VSE Aktiengesellschaft, Germany)

16:00 - 17:30
SD4: Applications
Room: 1.3.24

16:00

Automating the Bridge Between Ontology-Driven Language Engineering and MOF-Based Metamodeling

Katharina Polanec, Simon Eschlberger, Markus Michael Peter and Christian Neureiter (Salzburg University of Applied Sciences, Austria)

16:30

DMiNority Report: On Monitoring Cyber-crime Innovation in Dark Net Markets

Vitor Jesus (Aston University, United Kingdom (Great Britain)); Endrit Kromidha, Yichen Xi and Akash Dhorajiwala (University of Birmingham, United Kingdom (Great Britain)); Kartik Padalkar (Aston University, United Kingdom (Great Britain))

17:00

A Machine Learning Approach to Improve the Optimization of Travelling Salesman Problem

Katherine Ni (Deerfield Academy, USA)

18:00 – 21:00
Sponsor Cocktail
Room: Break Area

Technical Program: Wednesday, October 29

8:30 – 9:30

Keynote: Modeling and Simulation landscape, technology and trend

Speaker: Lionel Khimeche

Room: Amphitheatre R111

9:30 - 10:30

SA5: Defense and Security

Room: Amphitheatre R111

9:30

Lightweight AI-based Segmentation of Range-Doppler Maps for Real-Time Selection of Adaptive Processing Algorithms in Airborne Radar Systems

Tom Portafaix (IMT Atlantique & Thales LAS, France); Jean-Marc Le Caillec (IMT Atlantique, France); Michel Narozny (Thales LAS, France); Jean-François Degurse (Thales DMS, France)

10:00 A Systems Dynamic Approach in Aerospace and Defense Systems

Rai S Bindra (Stevens Institute of Technology, USA & Systems Engineering, USA); Mo Mansouri (Stevens Institute of Technology & University of South-Eastern Norway, USA); Ralph Tillinghast (US Army & CCDC Armaments Center, Picatinny Arsenal, NJ, USA)

9:30 - 10:30

SB5: Modelling and Prototyping

Room: 2234

9:30

Supporting the Synthesis of Validation Environments for Cross-System Generation Validation by Using MBSE Methodologies

Patrick Grycz (Karlsruhe Institute of Technology (KIT), Germany & Institute of Product Engineering (IPEK), Germany); Katharina Bause (Karlsruhe Institute of Technology (KIT), Germany); Tobias Düser (Karlsruhe Institute of Technology (KIT) & IPEK - Institute of Product Engineering at KIT, Germany)

10:00

Process Model for the Development of Physical Prototypes in Context of Hardware Start-Ups Using Maker Systems Engineering

Dominik Hermelingmeier and Jannis Graunke (Fraunhofer Institut Entwurfstechnik Mechatronik IEM, Germany); Leon Menne (Fraunhofer Institute for Mechatronic Systems Design, Germany); Anja Schierbaum (Fraunhofer Institut Entwurfstechnik Mechatronik IEM, Germany); Roman Dumitrescu (Heinz Nixdorf Institute, University of Paderborn, Germany)

9:30 - 10:30

SC5: Modelling

Room: 2329

9:30

Overcoming ReqIF Exchange Challenges through Deep File Analysis and Dedicated Tooling

Thomas Peugeot (MOSS SAS, France); Vincent Gillet (Direction Générale de l'Armement, France); Nicolas Merbouche (MOSS S.A.S, France)

10:00

Exploring Configuration Designs in Systems of Systems: a Multi-Agent Simulation Approach

Zelalem Mihret Belay (Mälardalen University, Sweden); Jakob Axelsson (Mälardalen University, Sweden & RISE Research Institutes of Sweden, Sweden)

9:30 - 10:30

SD5: Modelling

Room: 1.3.24

9:30

Risk Management in Manufacturing NPI Projects: A Comprehensive Survey

Makrand Godbole (Tesla Inc., USA & North Carolina State University, USA); Adwaita Janardhan Jadhav (Apple, USA)

10:00

Navigating Digital Transformation using Systems Engineering in the Semiconductor Ecosystem

John Blyler (Portland State University & JB Systems, USA); Smriti Joshi (Dassault Systemes, France)

10:30 – 11:00

Coffee Break

Room: Break Area

Technical Program: Wednesday, October 29

11:00 - 12:30

SA6: System Modelling

Room: Amphitheatre R111

11:00

Enabling Battery-Powered Commercial Aviation: Developing a System Architecture for a Multi-MW Charging System

Roy van Zijl, Stef A Wassens, Roberto Reyes Garcia and G. Maarten Bonnema (University of Twente, The Netherlands)

11:30

Systematic Cyber-Physical Modeling of Risks Using MBSE and Bond Graph Theory

Anna Nanzig and Christian Wolf (Technische Hochschule Köln, Germany); Anna Lena Menn (Bonn-Rhein-Sieg University of Applied Science, Germany)

12:00

Automating Object-Oriented Functional Modeling for Standardized Design in the New Space Domain

Alessandro Mastropietro (University of the Bundeswehr Munich, Germany); Saulius Rackauskas (RSI Europe, Lithuania); Andreas Knopp (Bundeswehr University Munich, Germany)

11:00 - 12:30

SB6: Simulation

Room: 2234

11:00

Co-Simulation with Legacy Models in Aerospace Through FMI and SSP - an Experience Report

Erik Andersson, Emil Broberg and Johan Cederbladh (Mälardalen University, Sweden); Erik Rosenlund (Saab, Sweden)

11:30

Model Order Reduction Technique for Vehicle Structural Flexibility Simulation

Salvatore Borgia and Francesco Toppoto (Politecnico di Milano, Italy)

12:00

Enabling Simulation of Product-Process-Resource Models Through Activity Diagrams

David Hoffmann (Otto-Von-Guericke University Magdeburg, Germany); Subham Kumar Raju, Prashant Pandey and Ajay Koilparambil (Otto-Von-Guericke-University Magdeburg, Germany); Arndt Lüder (Otto-von-Guericke Universität Magdeburg, Germany)

11:00 - 12:30

SC6: System Modelling

Room: 2329

11:00

Defining Roles, Enabling Systems: a Structured Role Model for Engineering Advanced Systems

Eva-Maria Grote (Karlsruhe Institute of Technology (KIT) & IPEK - Institute of Product Engineering, Germany); Christian Koldewey (Heinz Nixdorf Institute / Paderborn University, Germany); Daria Wilke (Fraunhofer IEM, Germany); Stefan Eric Schwarz (Karlsruhe Institute of Technology (KIT), Germany); Roman Dumitrescu (Fraunhofer-Einrichtung für Entwurfstechnik Mechatronik IEM, Germany); Albert Albers (Karlsruhe Institute of Technology (KIT), Germany)

11:30

From Generic to Specific: Scalable Role Modeling for Engineering Advanced Systems

Eva-Maria Grote (Karlsruhe Institute of Technology (KIT) & IPEK - Institute of Product Engineering, Germany); Christian Koldewey (Heinz Nixdorf Institute / Paderborn University, Germany); Thomas A Voelk (Karlsruhe Institute of Technology (KIT) & IPEK - Institute of Product Engineering, Germany); Stefan Eric Schwarz (Karlsruhe Institute of Technology (KIT), Germany); Roman Dumitrescu (Fraunhofer-Einrichtung für Entwurfstechnik Mechatronik IEM, Germany); Albert Albers (Karlsruhe Institute of Technology (KIT), Germany)

12:00

A Model Based Implementation of an IoT Framework

Jan van Deventer (Luleå University of Technology, Sweden)

12:30 – 13:30

Lunch

Room: Break Area

13:30 – 14:10

Keynote: Managing Complexity in Large-Scale System of Systems

Speaker: General Dominique Luzeaux, NATO HQ, Norfolk, VA, USA

Room: Amphitheatre R111

Technical Program: Wednesday, October 29

14:10 - 15:40

SA7: AI and System Engineering 2

Room: 2329

14:10

Using Large Language Models for System Modeling: Current State and Future Implications

Carina Freseman, Claudius Ellsel and Carl-Philipp Grunenwald (Technische Universität Berlin, Germany); Rainer Stark (TU Berlin, Germany)

14:40

If All Models are Wrong, What is Their Value in Model-Based Systems Engineering?

Johan Cederbladh (Mälardalen University, Sweden); Joanna Joseph (The University of Arizona, USA)

15:10

Cross-Level Impact Analysis (CLIA) Approach for Battery Technology Evaluation in Automotive Development - Initial Framework

Yunying Zeng, Zifeng Zhong, Katharina Bause and Albert Albers (Karlsruhe Institute of Technology (KIT), Germany)

14:10 - 15:40

SB7: INCOSE AFIS

Room: Amphitheatre R111

14:10

Product Line Systems Engineering for Critical Nuclear Infrastructures: Research Questions and Opportunities

Layina Chaabaoui (IMT Mines Ales, France & Laboratoire des Sciences des Risques (LSR), France); Jean-Samuel Wienin and Vincent Chapurlat (IMT Mines Alès, France & Laboratoire des Sciences des Risques (LSR), France); Victor Richet (Technical Lead, France); Robert Plana and Jérémy Bourdon (Assystem, France)

14:32

A co-constructed formal ontology modelling language to enhance interoperability

Thomas Barre (AIRBUS, France); Michel Sauvage (Company, France & Airbus SAS, France); Vincent Philippe and Matthieu Tonneau (AIRBUS, France)

14:55

Collective Reflection on Conversational Generative AI for (Model-Based) Systems Engineering: Insights from the INCOSE French Chapter

Emilie Perreau and Romain Pinquié (Grenoble Institute of Technology, France); Rémy Drouin (THALES/LAS/OME, France); Jérôme Huchard (Airbus Defence and Space, France); Jean-Denis Piques (Valeo, France)

15:17

How does modeling humans as system elements influence architectural trade-off decisions?

Yaroslav Menshenin and Romain Pinquié (Univ. Grenoble Alpes, CNRS, Grenoble INP, G-SCOP, Grenoble, France)

15:40 – 16:00

Coffee Break

Room: Break Area

16:00 - 17:30

SA8: Applications 3

Room: 2234

16:00

Collaborative Robot Arm Object Recognition and Grasping System Guided by Random Forest Classification Based Natural Language

Kuan-Wei Lu (National Chungshing University, Taiwan); Yu-Huan Cheng and Yi-Cheng Huang (National Chung Hsing University, Taiwan)

16:30

Experimental Analysis of a Novel Smart Solar PV Cleaning Robot Using Dry Air

Hammad Abdullah Alhammad (Prince Mohammad Bin Fahd University, Saudi Arabia)

17:00

Structured Representation of Industrial Robot Data for Augmented Reality Applications: a Unified Approach

Zoltán Szilágyi (Óbuda University, Hungary); Peter Galambos (Obuda University, Antal Bejczy Center for Intelligent Robotics, Hungary); Karoly Szell (Óbudai Egyetem, Hungary); Csaba Hajdu (Óbuda University, Hungary & Széchenyi István University, Hungary)

Technical Program: Wednesday, October 29

16:00 - 17:30
SB8: INCOSE AFIS 2
Room: Amphitheatre R111

16:00

A systems engineering approach for construction domain: the SmartFabrik method

Vincent Chapurlat (IMT Mines Alès, France & Laboratoire des Sciences des Risques (LSR), France); Charbel Kady (IMT Mines Alès, France); François Troussset (LGI2P, France); Julien Flécharde (BlocToBuild, France); Aurore Furlatneto (Dassault Systèmes, France); Herve Aubert (Bouygues Construction, France)

16:30

Overview of a tool-based process for automatic validation of system security requirements

Michel Bourdelles (UBS, France & ESIEE-IT, France); Jamal El Hachem (IRISA, France); Salah Sadou (IRISA, Université de Bretagne Sud, France)

17:00

System analysis of digital service system perimeter and its interdependencies in Life Cycle Assessment

Floris Thiant (IRT SystemX & LGI & LISN, France); Olivia Penas (IRT SystemX, France); Yann Leroy (CentraleSupélec, Université Paris-Saclay, France); Anne-Laure Ligozat (LISN, CNRS, ENSIIE Université Paris-Saclay, France)

16:00 - 17:30
SC8: Applications 3
Room: 2329

16:00

Reinforcement Learning for PID Control of Fractional Rössler Oscillator

Devasmito Das (École Centrale de Nantes, Indian Institute of Technology Madras, France); Ina Taralova (Ecole Centrale de Nantes, France); Tsonyo Slavov (Technical University of Sofia, Bulgaria); Jean Jacques Loiseau (LS2N UMR CNRS 6004, France); Manoj Pandey (Indian Institute of Technology Madras, India)

16:30

A Novel Structure of Pre-Emphasis Passive Amplifier by Employing Broadside Self Coupling

Jaeho Choi (Company & Samsung Electronics Hwa-Sung, South Korea, Korea (South))

17:00

An Agile and Practical System Simulation Approach for the Development of Hand-Held Power Tools

Helena Käppeler (ANDREAS STIHL AG & Co. KG, Germany); Mattea Eckstein (University of Stuttgart, Germany); Stefan C. Schlanderer (ANDREAS STIHL AG & Co. KG, Germany); Edmund Marth (Johannes Kepler University, Austria); Gerd Bramerdorfer (Johannes Kepler University Linz, Austria)

16:00 - 17:30
SD8: Applications 3
Room: 1.3.24

16:00

Third-Party Supplier Risk Re-Classification Using Multi-Model Semantic Voting and External Web Augmentation

Ben Manavi and Joann Ragozzino-Higgins (IBM, USA); Edward Chen (Idaho National Laboratory, USA); Jeremy Daily and Vincent P Paglioni (Colorado State University, USA)

16:30

Enhancing Case Retrieval in Case-Based Reasoning Through Improved Solution Space Diversity and Coverage

Juan José Montero-Jiménez (Tecnológico de Costa Rica, Costa Rica); Rob Vingerhoeds and Wendi Ding (ISAE-SUPAERO, France); Emmanuel Muñoz-Peña (Tecnológico de Costa Rica, Costa Rica)

17:00

Modeling and Identification of Drift in Knuckle Boom Cranes

Klara Franziska Schütze and Christian Schlette (University of Southern Denmark, Denmark)

18:00 – 21:00
Gala Dinner
Room: Break Area

Technical Program: Thursday, October 30

8:30 – 9:30

Keynote: The Systems Architect: the Realistic Visionary or the Visionary Realist?

Speaker: Maarten Bonnema, University of Twente, NL

Room: Amphitheatre R111

9:30 - 10:30

SA9: Modelling

Room: Amphitheatre R111

9:30

Formalized Transfer of Functional Architectures from Model-Based Systems Engineering to Generative Engineering

Bastian Menninger (RWTH Aachen University, Germany); Gregor Hoepfner (MSE, RWTH Aachen, Germany); Joerg Berroth and Georg Jacobs (RWTH Aachen University, Germany)

10:00

CPOT: Toolkit to Optimize Processes and Increase Efficiency

Arash Ostad Ebrahim Vesaghi (Stevens Institute of Technology, USA & Smart Carbon Solution, USA); Mo Mansouri (Stevens Institute of Technology & University of South-Eastern Norway, USA)

9:30 - 10:30

SB9: Healthcare 2

Room: 2329

9:30

Co-Designing Trustworthy Connected Medical Devices: A Vee-Model Framework for Usability and Regulatory Alignment

Athanasios Arvanitidis and Anna Palaiologk (Future Needs Management Consulting Ltd, Greece)

10:00

Towards a Framework for Automated Drug Compounding

Lorenzo Giunta and Vimal Dhokia (University of Bath, United Kingdom (Great Britain)); Mandeep Dhanda (University of Loughborough, United Kingdom (Great Britain))

9:30 - 10:30

SC9: Healthcare

Room: 2234

9:30

Toward a Modular Software Platform for Virtual Simulation and Design of Pharmaceutical Production Processes with Certifiable Quality

Jessica Mariño Salguero, Simon Gimpel, Joshua Frey and Jan Reich (Fraunhofer IESE, Germany); Rolf van Lengen (Fraunhofer Gesellschaft IESE, Germany); Pablo Oliveira Antonino (Fraunhofer IESE, Germany)

10:00

A System-of-Systems (SoS) Meta-Architecture Solution for Optimizing the Deceased-Donor Kidney Allocation System

Akinkunmi Akinola (Missouri University of Science and Technology, USA & Engineering Management and Systems Engineering, USA); Cihan H Dagli (Missouri University of Science and Technology, USA)

9:30 - 10:30

SD9: Cognitive, AI and MBSE

Room: 1.3.24

9:30

Decomposing Complexity: Modeling NLP Systems for Crisis Sensemaking with Systemigrams

David T Farr and Nicholas Clark (University of Washington, USA); Lynnette Hui Xian Ng (Carnegie Mellon University, USA); Jessica H. Zhu (University of Maryland, USA); Anna-Maria Gueorguieva, Jevin West and Kate Starbird (University of Washington, USA)

10:00

Dialogue-Imagination-Based CVCA: A Method for Extracting Emotional Value in Human-Centered Design

Mikiko Nakada, Fumihito Oura, Tsubasa Ito, Tsuyoshi Hirose, Kohei Tanaka, Seiko Shirasaka and Makoto Ioki (Keio University, Japan)

Technical Program: Thursday, October 30

11:00 - 12:30

SA10: Robotics

Room: Amphitheatre R111

11:00

Lie Group Control Architectures for UAVs: a Comparison of SE 2 (3)-Based Approaches in Simulation and Hardware

Dimitria P Silveria (Queen's University of Canada, Canada); Kleber Cabral, Peter Travis Jardine and Sidney Givigi (Queen's University, Canada)

11:30

A Systems Engineering Approach to High-Level Task Execution: A Case Study in Robotic Lawn Mowing Using LIMO and Gazebo

Yazan Youssef (Queen's University, Canada); Paulo Ricardo Marques de Araujo (Queens University, Canada); Aboelmagd Noureldin (Royal Military College of Canada & School of Computing, Queen's University, Canada); Sidney Givigi (Queen's University, Canada)

12:00

Autonomous Driving Test Scenario Generation and Integration Using UAV-Based Visual Data

Taihao Li, Björn Carstens and Xiaobo Liu-Henke (Ostfalia University of Applied Sciences, Germany)

11:00 - 12:30

SB10: MBSE, Circular Economy and Environmental Impacts

Room: 2329

11:00

Development and Evaluation of an Ontology for Model-Based Cross-Generational Modeling of Products and Production Systems in Circular Economy

Kristian Vljajic and Alex Martin (Karlsruhe Institute of Technology (KIT), Germany); Maximilian Fischer (Karlsruhe Institute of Technology (KIT) & IPEK - Institute of Product Engineering at KIT, Germany); Stefan Eric Schwarz (Karlsruhe Institute of Technology (KIT), Germany); Tobias Düser (Karlsruhe Institute of Technology (KIT) & IPEK - Institute of Product Engineering at KIT, Germany); Albert Albers (Karlsruhe Institute of Technology (KIT), Germany)

11:30

Integration of Model-Based Systems Engineering and Life Cycle Assessment to Consider Environmental Impacts During Conceptual Design

Thomas Schumacher (Technische Universität Clausthal, Germany); David Inkermann (Technische Universität Clausthal, Germany)

12:00

Accelerating the Energy Transition with Modular Building (PLE)

Jelena Marincic (TNO, The Netherlands & TNO ESI, The Netherlands); Teun Hendriks (TNO-ESI & Teatownlake, The Netherlands); Jacques Verriet (TNO-ESI, The Netherlands); Rob Ekkel (TNO ESI, The Netherlands); Joris Galle and Simon Rasing (Alliander (Qirion), The Netherlands); Marcel Willems (Enexis, The Netherlands); Frans Speelman (Stedin, The Netherlands); Mark Rienks and Rembrandt Koops (Tennet, The Netherlands)

11:00 - 12:30

SC10: Requirements

Room: 2234

11:00

Towards a Gherkin-Based Requirement Verification Approach in MBSE

David Hoffmann and Someshwar Reddy Ammana (Otto-Von-Guericke University Magdeburg, Germany); Ashley Jason Dsouza and Ranjithkumar Choudhaya Gudder (Otto-Von-Guericke-University Magdeburg, Germany); Arndt Lüder (Otto-von-Guericke Universität Magdeburg, Germany)

11:30

Aided Requirement Specification for Formal Requirement Validation

Beatrice Melani (Politecnico di Milano, Italy); Antonello Diglio and Davide Fabbroni (Leonardo S.p.A., Italy)

12:00

Enhancing the Integrity of Automatic Dependent Surveillance-Broadcast Systems Using Format-Preserving Encryption: an Embedded System Solution

Hasan Ali and Sylvain P. Leblanc (Royal Military College of Canada, Canada)

Technical Program: Thursday, October 30

11:00 - 12:30
SD10: Modelling
Room: 1.3.24

11:00
Cognitive Digital Thread for Intelligent Traceability Establishment in Model-Based Systems Engineering
Jianyu Huang (Beijing Institute of Technology, China); Guoxin Wang and Shouxuan Wu (Beijing Institute of Technology, China); Jinzhi Lu (Beihang University, China); Haoxuan Zhang and Jiaying Qiao (Beijing Institute of Technology, China)

11:30
Harnessing Legacy Air Platforms Data with NLP for AI Training
Oguz Gorkem Aslankoc, Barış Balaban and Mustafa Yenice (Aselsan, Turkey)

12:00
System Architecture and Analytical Inverse Kinematics for Autonomous Docking of Passenger Boarding Bridges
Jingye Yee (Fraunhofer IEM, Germany); Dominik Hermelingmeier (Fraunhofer Institut Entwurfstechnik Mechatronik IEM, Germany); Abishai Asir A Thederajan (Universiti Tun Hussein Onn Malaysia, Malaysia); Cheng Yee Low (Universiti Tun Hussein Onn Malaysia (UTHM), Malaysia); Alexander Gossen (Fraunhofer-Institut für Entwurfstechnik Mechatronik IEM, Germany); Roman Dumitrescu (Heinz Nixdorf Institute, University of Paderborn, Germany)

12:30 – 13:30
Lunch
Room: Break Area

13:30 – 14:10
Keynote: Insights from a career in the development and evolution of Systems (of Systems)
Speaker: Alan Harding, Incose
Room: Amphitheatre R111

14:10 - 15:40
SA11: Cyber-physical Systems
Room: Amphitheatre R111

14:10
Consistently Inconsistent: AI-Analyzed Patterns in Inconsistency-Situations of Cyber-Physical Systems Development
Thomas A Voelk (Karlsruhe Institute of Technology (KIT) & IPEK - Institute of Product Engineering, Germany); Konstantin Nowak and Felix Pfaff (IPEK - Institute of Product Engineering, Germany); Razieh Dehghani (Karlsruhe Institute of Technology (KIT), Germany); Tobias Düser (Karlsruhe Institute of Technology (KIT) & IPEK - Institute of Product Engineering at KIT, Germany); Anne Kozirolek and Albert Albers (Karlsruhe Institute of Technology (KIT), Germany)

14:40
How to "Measure" a Mirage: Assessing Inconsistency in Mechatronic and Cyber-Physical Development Projects
Albert Albers and Anne Kozirolek (Karlsruhe Institute of Technology (KIT), Germany); Thomas A Voelk and Eva-Maria Grote (Karlsruhe Institute of Technology (KIT) & IPEK - Institute of Product Engineering, Germany); Razieh Dehghani (Karlsruhe Institute of Technology (KIT), Germany); Tobias Düser (Karlsruhe Institute of Technology (KIT) & IPEK - Institute of Product Engineering at KIT, Germany)

15:10
Multi-Domain Dependency Graphs for Analyzing Cyber-Physical Systems
Maximilian Beck, Vitus A Lüntzel and Eric Sax (Karlsruhe Institute of Technology, Germany)

14:10 - 15:40
SB11: Education and Training
Room: 2329

14:10
Educating the Next Generation of Engineers in Systems Thinking and Digital Engineering
Atilla Anil Köstekci, Anton Dybov, Carina Fresemann and Lydia Kaiser (Technische Universität Berlin, Germany); Rainer Stark (TU Berlin, Germany)

14:40
Doctoral Studies Observed Through the Lens of Systems, Complexity, and Cybernetics
Johan Cederbladh (Mälardalen University, Sweden)

15:10
Live Lab for System of Systems Education: Designing for the Ideal, Colliding with the Real
Stefan Eric Schwarz, Kristian Vljajic and Maximilian Kuebler (Karlsruhe Institute of Technology (KIT), Germany); Eva-Maria Grote (Karlsruhe Institute of Technology (KIT) & IPEK - Institute of Product Engineering, Germany); Tobias Düser (Karlsruhe Institute of Technology (KIT) & IPEK - Institute of Product Engineering at KIT, Germany); Albert Albers (Karlsruhe Institute of Technology (KIT), Germany)

Technical Program: Thursday, October 30

14:10 - 15:40

SC11: System of Systems

Room: 2234

14:10

System-Level Integration of Modular Language Models for Real-Time Risk Assessment in Third-Party Risk Management Platforms

Ben Manavi and Avery Aude (IBM, USA); Edward Chen (Idaho National Laboratory, USA); Jeremy Daily and Vincent P Paglioni (Colorado State University, USA)

14:40

Design, Implementation, Integration, Verification and Validation, and Qualification of Systems of Systems with Humans and Automation in the Loop: Challenges and Evaluation Criteria

Charlotte Strobbe (ISAE SUPAERO, France); Rob Vingerhoeds (ISAE-SUPAERO, France); Sophia Salas Cordero (ISAE SUPAERO, France); Stéphane Valès (Ingenuity IO, France)

15:10

Integrated Logistics Support Considerations for Mission Engineering

Allie Kulcsar (UNISA, Australia); Mahmoud Efatmaneshnik (University of South Australia, Australia)

15:40 – 16:00

Coffee Break

Room: Break Area

16:00 - 17:30

SA12: Applications and Case Studies

Room: Amphitheatre R111

16:00

Connecting the Development of the Einstein Telescope by Applying Model-Based Systems Engineering

Frederik Moers (MSE, RWTH Aachen, Germany); Georg Jacobs (RWTH Aachen University, Germany); Konrad Frischkorn, Philipp Höck, Gregor Hoepfner and Jan Niklas Schmitz (MSE, RWTH Aachen, Germany)

16:30

More than a Document: an Industrial View on the Product Profile in Product Engineering Processes

Albert Albers (Karlsruhe Institute of Technology (KIT), Germany); Tobias Düser (Karlsruhe Institute of Technology (KIT) & IPEK - Institute of Product Engineering at KIT, Germany); Stefan Eric Schwarz and Florian Schneider (Karlsruhe Institute of Technology (KIT), Germany); Manuel W. Spekker (Karlsruhe Institute of Technology, Germany); Thomas A Voelk (Karlsruhe Institute of Technology (KIT) & IPEK - Institute of Product Engineering, Germany)

17:00

Knowledge Automation and Requirements Analysis in E-Commerce Fraud Detection

Davis C Loose and Megan E. Gunn (University of Virginia, USA); Igor Linkov (USA); Matthew C Gunn and Negin Moghadasi (University of Virginia, USA); Zachary A Collier (Radford University, USA); James H. Lambert (UVa, USA)

16:00 - 17:30

SB12: Applications and Case Studies 2

Room: 2329

16:00

A Strategic Framework for Enhancing Productivity in the Building Construction Industry Through Construction 4.0 Integration

Gifty Elizabeth Syam and Steny Ann Sabu (Khalifa University, United Arab Emirates); Vikas Swarnakar (Khalifa University of Science and Technology, Abu Dhabi, UAE, United Arab Emirates); Ahmad Mayyas and Malik Khalfan (Khalifa University, United Arab Emirates)

16:30

Framework for Developing Performance Indicators for Industrial Optimization in SMEs

Kevin Hansch (Otto-von-Guericke University, Germany); Arndt Lüder (Otto-von-Guericke Universität Magdeburg, Germany); David Hoffmann (Otto-Von-Guericke University Magdeburg, Germany)

17:00

Success Criteria for Service Engineering NPI Products: A Comprehensive Survey

Makrand Godbole (Tesla Inc., USA & North Carolina State University, USA); Adwaita Janardhan Jadhav (Apple, USA)

Technical Program: Thursday, October 30

16:00 - 17:30

SC12: Automotive

Room: 2234

16:00

Structuring Automotive Data for Systems Engineering: a Taxonomy-Based Approach

Carl Philipp Hohl (FZI Research Center for Information Technology, Germany); Philipp Reis and Tobias Schuermann (FZI Forschungszentrum Informatik, Germany); Stefan Otten and Eric Sax (FZI Research Center for Information Technology, Germany)

16:30

Automatic Platform Configuration and Software Integration for Software-Defined Vehicles

Fengjunjie Pan and Jianjie Lin (Technical University of Munich, Germany); Markus Rickert (University of Bamberg, Germany)

17:00

Model-Based Evaluation of Remaining Useful Life and Reusability of Used Systems

Jennifer Dreier (RWTH Aachen, Germany); Georg Jacobs (RWTH Aachen University, Germany); Gregor Hoepfner (MSE, RWTH Aachen, Germany)

16:00 - 17:30

SD12: Education and Training

Room: 1.3.24

16:00

Prototype for the Assessment of Student Performance in an Adaptive Learning System Based on a Bayesian Network

Yeimy Paola Valencia Usme (TH-Aschaffenburg, Germany); Galia Weidl (Daimler AG, Germany); Jörg Abke (University of Applied Sciences Aschaffenburg, Germany)

16:30

Systematic Competency Evaluation of Existing Frameworks for System-of-Systems Engineering

Fumihito Oura, Yoshiko Ohno and Seiko Shirasaka (Keio University, Japan)

17:00

Integrating Signal Decomposition, Stochastic Modeling, and Deep Learning for Interpretable Predictive Maintenance

Alfredo Garro and Alessandro Sorrenti (University of Calabria, Italy)

18:00 – 21:00

Sponsor Cocktail

Room: Break Area