



IEEE ISSE 2026

12th IEEE International Symposium on Systems Engineering
Dubrovnik, Croatia | September 22-24, 2026



IEEE International Symposium on Systems Engineering SYMPOSIUM PROGRAM

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Distinguished guests, esteemed colleagues, dear friends, ladies and gentlemen,

On behalf of the Organising Committee and in my capacity as Co-Chair of the IEEE-ISSE Systems Thinking Conference, it is my great honour and privilege to extend a warm welcome to you at the University of Dubrovnik in the city of Dubrovnik and in Croatia.

Today we are here not only for a conference but for a meeting of minds, disciplines, cultures, and different points of view. We come from over 40 countries, each bringing with us different academic backgrounds, professional experiences, intellectual approaches, and ways of seeing the world. Nevertheless, in this exceptional location, we share an aim: to grasp the concept of complexity, to question long-held assumptions, and to enhance our collective ability to design better systems for the future. There could hardly be a more appropriate setting for such a discussion than Dubrovnik, the historic Ragusa, because Dubrovnik is not just a beautiful city; it is a living example of systems thinking. Long before the idea of "systems thinking" was part of our academic language, the Republic of Ragusa demonstrated a remarkable awareness of interdependence. Its wealth was based on maritime

trade, diplomacy, law, engineering, medicine, science, culture, and, most importantly, on the relationships between these areas. The city realised that resilience cannot be achieved by a single institution; it arises out of the interaction among the various parts of a system. Look at the remarkable examples around us. In 1317, the Franciscan pharmacy in Dubrovnik began what has become a continuous tradition of pharmaceutical practice, and it is one of the oldest pharmacies in Europe still in operation today. This was no ordinary pharmacy; it was part of a wider system involving health, knowledge, education, religious institutions, civic duty, and community care.

There was one of the most remarkable instances of systems thinking in the history of public health. In 1377, the Republic of Ragusa introduced a legal requirement to isolate both people and goods from areas affected by the plague. This practice evolved into what is now known as quarantine, the length of time eventually becoming linked to forty days; this is where the term quarantine comes from. Consider what this means. They were not simply treating disease; they were bringing together health, trade, mobility, governance, risk, economics, and the public interest into a single coordinated system.

They realised that if society was to be protected it was necessary to manage the relationships involving people, goods, information and movement. That is what is known as systems thinking. And Dubrovnik kept on showing this outstanding ability to link together apparently different areas. The Republic built a highly developed water infrastructure. In the fifteenth century a large water supply system was introduced into the city, this being made possible by impressive engineering feats and public fountains. It made investments in medicine and in social care. It set up institutions for the care of vulnerable members of society. It created systems of governance and diplomacy which allowed a small republic to move among much larger powers. Their strength was not just in their walls; it was in the system behind the walls. And this intellectual tradition carried on into the Renaissance and the early modern period. We should recall Marin Getaldić, one of Dubrovnik's outstanding mathematicians and physicists. His work brought together geometry, algebra, measurement, optics and experimentation. He is an early example of interdisciplinary scientific inquiry in which mathematics and physical observation influenced each other. And then came another remarkable intellectual figure from Dubrovnik: Ruđer Bošković. As a mathematician, astronomer, physicist and philosopher, Bošković is exactly the kind of interdisciplinary thinking that our conference honours. The field of his work spanned the boundaries that we today would call physics, mathematics, astronomy, philosophy and engineering. His eighteenth-century theory of forces was a highly ambitious attempt to understand nature as a system of interconnected relationships and forces. In other words, Dubrovnik did not generate knowledge by keeping the different disciplines separate; it produced knowledge by linking them together. And perhaps this is the most important reason why Dubrovnik is such a suitable host for a conference on systems thinking. When we examine the history of Ragusa, we notice a recurring pattern: the problems were interrelated and so the solutions had to be as well. A pandemic was not just a medical issue; it was also a problem relating to trade, governance, human behaviour, logistics, economics and trust. Water was not simply an engineering matter; it was a question of public health, urban planning, infrastructure and social welfare. International trade was not just an economic activity.

Diplomacy, law, information networks, risk management, and an understanding of culture were all required. Scientific discovery was not limited to a single discipline since it arose out of the interactions between mathematics, physics, astronomy, philosophy, experimentation, and observation. This is very similar to the intellectual basis of systems thinking, which consists in seeing the whole without losing sight of the parts and in understanding the parts through their relationships with the whole.

Dear colleagues, if you are coming to Croatia for the first time I hope that your stay will be more than just a conference. I hope that you will get to know Croatia through its history, its scientific heritage, its culture, its people, the beauty of its Adriatic landscape and its remarkable tradition of bringing together different worlds. Since you are coming from over 40 countries, this diversity constitutes a system. Each of you has a different point of view. Each discipline uses a different language and each culture has its own way of experiencing complexity, uncertainty, resilience and innovation. When these different perspectives come into contact, something new may emerge. And that is the outcome that I hope will take place here. I hope that your ideas will collide; precisely in the best academic sense. I hope that existing assumptions will be challenged. I hope that the various disciplines will go beyond their traditional boundaries. I hope that the conversations will carry on beyond the official sessions and that new collaborations will arise which were not previously expected. I am particularly pleased to welcome our distinguished plenary speakers, Professor Tugrul Daim and Professor Vikas Kumar.

We are very honoured to have you here. The intellectual value that your participation brings to this event is considerable, and we look forward to learning from your views, experiences, and scholarly work.

I should also want to offer my most sincere thanks to all members of the organising and scientific teams. To Liz Davis, Sidney Givigi, Andy Chen, Paolo Carbone, to our host institution the University of Dubrovnik, to the Rector of the Akademus dormitory, Nebojša Stojčić, and to all of you.

Such a symposium is in fact a complex system.

Its success is based on hundreds of interactions involving chairs, committee members, reviewers, authors, speakers, volunteers, institutions, technical teams, and participants. Although many of the contributions stay unseen, they are essential.

To each and every one of you who have given your time, your energy, your expertise and your patience: Thank you.

Lastly, I would like to end by offering you one idea. As you walk along the ancient streets of Dubrovnik on this occasion, go beyond appreciating the beauty of the stone. Search for the system. Examine the walls and the harbour. Look at the water supply infrastructure. Consider the pharmacy. Think about the quarantine measures. Reflect on the merchants, the diplomats, the physicians, the engineers, the mathematicians, the astronomers, the philosophers and the ordinary citizens whose

activities have been linked across generations. And ask yourselves: What can we learn from a city that understood interdependence long before we had the language to describe it? Maybe the answer is that innovation is seldom a standalone event; it is an emergent feature of relationships. Knowledge increases through exchange. Resilience develops through adaptation. And progress takes place when people, disciplines, institutions and ideas are connected. That is the spirit that I hope we will carry into this conference. Let us make connections. Let us share our ideas freely. Let us produce new knowledge. Let us establish collaborations that will last long after we have left Dubrovnik. And let us relish the great privilege of doing all of this together, in a city whose history teaches us that some of the most effective solutions arise when we learn to see the world not as a collection of separate parts but as an interconnected whole. On behalf of the IEEE-ISSE Systems Thinking Conference, I cordially welcome you all to Dubrovnik, to Croatia, and to this international community of scholars, researchers, practitioners and innovators. I hope that you will have an inspiring conference, fruitful discussions, unexpected discoveries, lasting collaborations, and a wonderful atmosphere of curiosity and friendship. Welcome to Dubrovnik. Welcome to Croatia. Welcome to the IEEE-ISSE Systems Thinking Symposium.

Thank you.

Professor Marina Dabić
General Co-Chair, IEEE ISSE 2026
IEEE Senior Member



On behalf of the IEEE Systems Council, the Organizing Committee, and our academic host, the University of Dubrovnik, it is my privilege to welcome you to the 12th IEEE International Symposium on Systems Engineering (IEEE ISSE 2026). As we celebrate twelve years of advancing systems engineering research and practice, we are honored to gather our global community in the historic city of Dubrovnik, Croatia; a place renowned for its tradition of dialogue, resilience, and open exchange.

The IEEE Systems Council unifies and advances work across diverse technical domains, promoting the practice, theory, and application of systems engineering worldwide. By connecting fields such as autonomous systems, aerospace, cybersecurity, and intelligent infrastructure, the Council offers a cohesive platform for addressing the increasing complexity of modern engineering challenges. Our symposium convenes researchers, industry leaders, systems architects, and educators to share insights, showcase breakthroughs, and collaboratively shape the evolving landscape of system-of-systems engineering.

We are deeply honored to join in partnership with the University of Dubrovnik. As a distinguished academic institution in the Adriatic region, the University, guided by the excellence of its Department of Electrical Engineering and Computing, stands at the forefront of research in modern computing, intelligent systems, and networked engineering. With state-of-the-art facilities enriched by a longstanding tradition of higher learning, our host offers a truly inspiring setting for scholarly engagement, technical discourse, and the collective advancement of systems engineering.

This year's technical program reflects both the global reach and academic rigor of our community. We received 184 research paper submissions from authors across 34 countries. Following a rigorous peer-review process, the Technical Program Committee carefully selected and accepted 101 high-quality papers for presentation. Throughout IEEE ISSE 2026, these works will address critical modern challenges, including the integration of artificial intelligence and digital twins in complex control systems, the security and resilience of cyber-physical supply chains, microgrid design for sustainable energy transitions, and advanced Model-Based Systems Engineering (MBSE). We encourage all attendees to engage actively in technical sessions, debate emerging paradigms, and share practical insights drawn from industrial applications.

Beyond our technical agenda, Dubrovnik, the "Pearl of the Adriatic", offers a rich backdrop for reflection and networking. A UNESCO World Heritage site, the city invites you to discover its historic Old Town, walk the ancient limestone walls, explore Lokrum Island, or take in the panoramic views of the Elaphiti archipelago from Mount Srđ. We hope you will take time to experience the distinctive culture and hospitality of this historic coastal region.

An event of this scale is only possible through the dedication and hard work of many individuals. I extend my sincere gratitude to the members of the Organizing Committee, Technical Program Committee, reviewers, and volunteers whose tireless efforts and meticulous planning have brought this 12th edition of the symposium to fruition. Their commitment ensures a rigorous academic standard and a seamlessly executed program for all participants.

Ultimately, the impact of ISSE 2026 relies on the active participation of our delegates. We invite you to utilize the social receptions, interactive sessions, and informal gatherings to forge new partnerships, reconnect with international colleagues, and initiate lasting research collaborations.

Thank you for your valuable contributions to IEEE ISSE 2026. We wish you a productive, engaging, and memorable symposium in Dubrovnik.

Andy Chen
General Co-Chair, IEEE ISSE 2026
IEEE Systems Council



It is our great pleasure to welcome you to the 2026 IEEE International Symposium on Systems Engineering in Dubrovnik. Thanks to the strong support of our General Chair, Marina Dabić, the dedicated efforts of Liz Davis and 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 101 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 two keynote lectures, on emerging topics with promising applications.

We look forward to welcoming you in person to Dubrovnik. 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.

Sidney Givigi
2026 IEEE International Symposium on Systems Engineering (ISSE) Technical Program Chair

Venue Information

The University of Dubrovnik is the newest university in Croatia. It was established in 2003, on the foundations of a very long tradition which goes back to the 17th century, but also on decades of modern higher education. On its programs, organization, and technical equipment, the University of Dubrovnik stands among the modern educational institutions.

We will begin at Akademis Academia (the student dormitory and hotel facility associated with the University of Dubrovnik), which is located at Ulica Marka Marojice 2b, 20000 Dubrovnik, Croatia. Following lunch on September 22, we will progress to the Faculty of Economics and Business (FEB) building (sessions will begin at 2:00 PM), Villa Elisa campus on Lapadska obala (Address: Lapadska obala 7, 20000 Dubrovnik, Croatia). The two buildings are about a 15-minute walk from each other. We will return to FEB September 23 and 24. Meals (lunches, reception, and awards dinner) will be served at Akademis Academia.

Akademis Academia

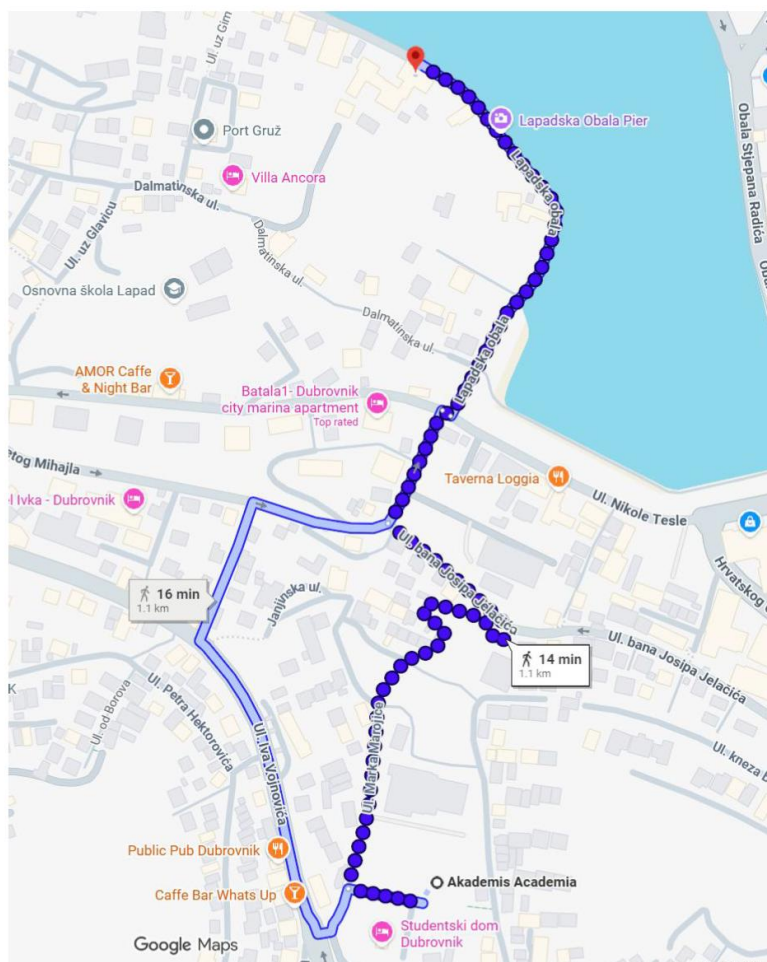
Ulica Marka Marojice 2b
20000 Dubrovnik, Croatia

- Conference Hall "Salocha"
- Classroom XY3 (3rd fl)
- Classroom ZY3 (3rd fl)
- Classroom XY4 (4th fl)
- Classroom ZY4 (4th fl)
- R&C Academia (Meals)

Faculty of Economics and Business (FEB)

Lapadska obala 7
20000, Dubrovnik, Croatia

- E1 Veliki Amphitheater
- Ucionica B2
- Ucionica B3
- Ucionica B4
- Ucionica E2



About Dubrovnik

Dubrovnik and its surroundings form a harmonious and inseparable whole, defined by stunning natural landscapes, rich Mediterranean vegetation, a mild climate and charming small settlements with deep historical roots. This region offers a unique blend of cultural heritage, natural beauty and tradition that makes it one of the most distinctive areas on the Adriatic coast.

Once part of the Dubrovnik Republic, the area still reflects its historical ties through architecture, customs and everyday life. While Dubrovnik is world-renowned for its UNESCO-protected Old Town, experiencing the city fully also means exploring its nearby surroundings.

The wider Dubrovnik area offers a wealth of experiences and excursion opportunities, from the countryside of Konavle and the beaches of Župa Dubrovačka to the green Elaphiti Islands and many other attractive destinations. Thanks to excellent land and sea connections, it's easy to discover diverse landscapes, historical sites and a rich gastronomic scene that completes the experience of southern Croatia.

Popular Attractions

City Walls
Stradun
Panoramic View from the Mount Srđ
Lovrjenac Fortress
Palace Sponza
Lokrum Island
Rector's Palace
Orlando's Column
Dubrovnik Cathedral
Church of St. Blaise

Tugrul Daim
Tuesday, September 22
8:15 – 9:30



Cybersecurity Technology Roadmapping: A Systems Approach for the Challenge

In a world that is transforming digitally, cybersecurity is both a line of defense and a vulnerability for many organizations. While big corporations can afford to be protected, smaller organizations and the public sector, which make up the majority of the economies of the world, are becoming extremely vulnerable every passing day. Artificial intelligence is rattling the battlefield, providing ammunition to both sides. We at the Oregon Cybersecurity Center of Excellence focus our efforts on educating and creating awareness in sectors ranging from energy to health. We have worked closely with the US Department of Defense, the National Security Agency, and other national and local agencies to identify technological gaps and R&D opportunities in the cybersecurity field through technology roadmaps. This talk will provide insight to these efforts.

Biography

Tugrul Daim is a Professor of Engineering and Technology Management at Portland State University and the former Editor in Chief of IEEE Transactions on Engineering Management. Professor Daim is a senior advisor and consultant specializing in cybersecurity, artificial intelligence, and technology risk governance. He advises boards, executives, and public-sector leaders on evaluating, governing, and investing in emerging technologies amid uncertainty, regulation, and systemic risk. Dr. Daim brings over 25 years of experience spanning industry, government, and academia, including senior management roles at Intel Corporation, advisory work for U.S. federal and state agencies, and international consulting engagements across energy, cybersecurity, digital infrastructure, and advanced manufacturing sectors. His work focuses on cybersecurity readiness, AI strategy and governance, technology roadmapping, and R&D portfolio decision-making, with particular emphasis on critical infrastructure and regulated industries. He currently serves as Associate Director of the Mark O. Hatfield Cybersecurity & Cyber Defense Policy Center and as Senior Personnel on the \$10 million Oregon Cybersecurity Center of Excellence initiative, where he works closely with government, industry, and academic partners on cybersecurity strategy, policy, and ecosystem development. He has also served on R&D advisory boards and provided independent expert advice to utilities, multinational corporations, and international technology observatories. Dr. Daim is widely published, with 300+ peer-reviewed articles, and is internationally recognized for his work in technology forecasting, innovation systems, and strategic decision models. He is known for translating complex cybersecurity and AI issues into clear, decision-ready insights for senior leaders and boards.

Vikas Kumar
Wednesday, September 23
8:00 – 9:30



Engineering Sustainable and Intelligent Systems: Leveraging AI, Digital Supply Chains, and Circular Economy for Industrial Transformation

The next industrial revolution will not be defined solely by smarter technologies, but by our ability to engineer systems that are intelligent, resilient, and sustainable. As organizations navigate unprecedented challenges, from climate change and resource scarcity to supply chain disruptions and rapid advances in artificial intelligence (AI), there is an urgent need to rethink how engineering systems are designed, managed, and transformed.

This keynote presents a vision for the convergence of AI, digital supply chains, and circular economy principles as the foundation of sustainable industrial transformation. Drawing on my research and international collaborations in sustainable operations, digital transformation, Industry 4.0/5.0, and circular economy, the talk will illustrate how systems thinking, digital twins, blockchain, and AI-enabled decision intelligence can create adaptive and human-centric industrial ecosystems. Through examples from manufacturing and global supply networks, the keynote will demonstrate how engineering innovation can simultaneously

enhance resilience, operational excellence, and environmental stewardship. It concludes by outlining a future research agenda for Engineering Sustainable and Intelligent Systems, highlighting opportunities for academia, industry, and policymakers to co-create resilient, circular, and technology-enabled societies.

Biography

Professor Vikas Kumar is Deputy Vice-Chancellor (Research and Innovation) and Professor of Operations and Supply Chain Management at the University of Portsmouth, UK. He provides strategic leadership for the University's research and innovation agenda, fostering interdisciplinary collaboration, strengthening research excellence, and enhancing partnerships with industry, government, and international stakeholders to deliver impactful solutions to global challenges.

Prior to joining the University of Portsmouth, Professor Kumar served as Associate Dean for Research, Innovation and Enterprise at Birmingham City University and previously held the role of Director of Research and Scholarship at Bristol Business School, University of the West of England. He has also held academic and research positions in Ireland and Hong Kong. Professor Kumar earned his PhD in Management Studies from the University of Exeter and holds a bachelor's degree in Metallurgy and Materials Engineering from NIAMT (Formerly NIFFT), Ranchi University, India.

An internationally recognized scholar, Professor Kumar's research focuses on sustainable and digital supply chains, circular economy, operations excellence, and supply chain resilience. He has authored more than 350 publications, including journal articles, conference papers, books, and book chapters, and his work has made a significant contribution to advancing sustainable business and operational practices. His research has been widely cited, earning him recognition among Clarivate's Highly Cited Researchers and inclusion in Stanford University and Elsevier's Top 2% Scientists rankings.

Beyond his research, Professor Kumar actively contributes to the global academic community through editorial leadership, research collaboration, doctoral supervision, and engagement with industry. He is passionate about translating research into real-world impact and promoting innovation that supports economic growth, environmental sustainability, and societal well-being.

Exhibitors



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Dubravko Sabolić, Croatian Transmission System Operator
Srdan Skok, University North
Nenad Uzelac, G&W Electric
Alfredo Vaccaro, University of Sannio

Engineering Resilient Power Systems-of-Systems Under the Green Transition: Architectural, Operational, and Market Challenges

Organizers:

Srdan Skok, University North, Croatia; **Renata Rubeša**, Croatian Transmission System Operator, Ltd., Croatia; and **Dubravko Sabolić**, Croatian Transmission System Operator, Ltd., and the University of Zagreb, Croatia

Abstract:

This session is designed as a structured track combining short framing interventions with moderated expert panel discussions, rather than a session of conference paper presentations. The format is intended to encourage technically rigorous exchange while maintaining thematic coherence and supporting interactive discussion between panelists and the audience.

The green transition represents not only a technological substitution process, but a large-scale reconfiguration of a continental socio-technical system-of-systems. Power systems are evolving from inertia-dominated, centrally controlled architectures toward converter-based, digitally mediated, and market-coupled infrastructures. This transformation introduces new forms of emergent behavior, cross-layer interactions, and systemic risk that cannot be adequately understood through isolated technical or economic lenses alone.

Addressing these challenges requires explicit systems thinking—recognizing the interdependence of physical infrastructure, digital control layers, market design, regulatory frameworks, and societal expectations. The session examines this ongoing transformation from a systems engineering perspective, integrating architectural design, operational stability, market mechanisms, and regulatory structures within a unified resilience-oriented framework.

In recent years, this transformation has coincided with a visible increase in the frequency, severity, and societal impact of large-scale disturbances and blackouts, particularly in highly interconnected and market-oriented environments, revealing emerging systemic vulnerabilities associated with reduced synchronous inertia, declining system strength, high penetration of power-electronic interfaced resources, and tight cross-border coupling. Similar phenomena have been observed globally, with major outages in North America, Australia, South America, and parts of Asia demonstrating how rapidly converter-dominated systems can transition from normal operation to widespread collapse within seconds.

Within this changing landscape, new categories of system actors are gaining prominence. Large electricity consumers equipped with advanced power-electronic interfaces—such as hyperscale data centers—are becoming significant dynamic participants in the power system. Although not generators in the traditional sense, their scale, controllability, power quality sensitivity, and increasing deployment of on-site generation and storage create new forms of interaction between demand-side infrastructures and transmission-level dynamics.

A central systems-engineering issue addressed by the session is the growing misalignment between market mechanisms and physical system requirements. While liberalized, short-term electricity markets effectively promote economic efficiency, they do not always adequately value essential system attributes such as inertia, system strength, voltage support, and fast frequency response. As a result, transmission system operators increasingly maintain security of supply under shrinking stability margins and more volatile operating conditions. This technical–economic coupling problem reflects a broader architectural tension between market-layer incentives and physical-layer constraints.

Strategic Management of Complex and Regulated Systems: Interplay of Market and Non-Market Forces

Many complex engineered systems operate in environments where classical market competition plays only a limited role, while regulation, public policy, societal expectations, and institutional constraints fundamentally shape strategic outcomes. This is particularly visible in sectors such as energy systems, electricity transmission, telecommunications, transportation infrastructure, water utilities, healthcare, and other safety- or reliability-critical systems. Similar dynamics, however, are increasingly observed in a wide range of industries influenced by platform dominance, public accountability, or strong policy intervention.

In such contexts, organizations often act as system operators, system integrators, or coordinators of systems-of-systems rather than competitors in a traditional market sense. Their strategic challenges arise less from rivalry and more from the interaction between market forces and non-market forces, including regulators, policymakers, courts, public opinion, activist groups, and various actors seeking to influence the allocation of economic or social value within the system.

The electricity and energy sectors provide a particularly transparent illustration of these dynamics, as system operators must continuously balance technical constraints, long-term investment decisions, regulatory oversight, political objectives, and societal expectations. However, the strategic tensions observed in these sectors are not unique and can be found across many complex socio-technical systems.

This special session aims to create a forum for discussing how organizations strategically manage complex systems exposed to strong non-market influences, and how market-based mechanisms interact with regulatory, political, and societal forces to shape system evolution, resilience, and long-term sustainability.

The session aligns closely with the IEEE ISSE focus on systems-of-systems, enterprise systems engineering, societal and political impacts of systems, decision analysis, resilience, and management systems, while explicitly encouraging dialogue between systems engineering and strategic management perspectives.

Organizers: **Dubravko Sabolić**, Croatian Transmission System Operator, Ltd., and the University of Zagreb and **Murat Akpinar**, JAMK University of Applied Sciences, Jyväskylä, Finland

Cybernetic Governance and Viable Systems: Engineering Resilience in Complex Systems-of-Systems

Traditional systems engineering often focuses on the 'how' of technical integration. In contrast, systems thinking and cybernetics provide the 'why' and 'how' of long-term survival and adaptation. This track invites papers applying these theoretical frameworks to the engineering of modern, large-scale systems. It specifically seeks contributions on how to design and implement collective intelligence mechanisms that allow complex, large-scale systems to self-organize, learn, and maintain viability in unpredictable environments.

Key topics of interest:

- Theoretical Foundations of Viability: Exploring how systems thinking and cybernetic feedback loops can strengthen the theoretical foundations of Systems Engineering and improve the benefits of systems thinking and collective intelligence mechanisms in industrial applications.
- Governing systems of systems (SoS): Applying cybernetic control models to manage the autonomy and coordination required in the 'system of systems' environment.
- Engineering for resilience and survival: Using the principles of systems thinking to design cybersystemic organizations that can maintain core functions amidst environmental shifts and disruptions.
- Viable Management Systems: Integrating systems thinking into management systems and program/project management to improve organisational agility and decision-making.
- Socio-technical cybernetics: Analysing the societal and political impacts of systems and human systems integration through the lens of holistic systems theory to ensure ethical and sustainable system design.
- Governance of Distributed Autonomy: Building cybersystemic structures that balance individual component autonomy with the collective goals of the total system.

Organizers: **Francesco Caputo**, University of Naples "Federico II", Italy; Igor Perko, University of Maribor, Slovenia; and Alfonso Reyes Alvarado, University of the Andes, Colombia.

Funding Opportunities in Europe: European Research Council (ERC)

Research funding is essential to enable researchers to pursue ground-breaking ideas and original research. It is also very important in research collaborations. In this session, one of the main EU research funding programmes will be presented: The European Research Council (ERC) is a leading European funding body supporting excellent investigator-driven frontier research across all fields of science. ERC calls are open to researchers around the world. The ERC offers various outstanding funding opportunities with grants budgets of €1.5 to €3.5 million for individual scientists.

The session will provide an excellent opportunity for participants to find out the latest information about this EU funding programme. It will be particularly helpful to early-career and mid-career participants, especially graduate students, post-docs, researchers, and tenure-track faculty thinking about applying for funding to conduct research in Europe. All nationalities of applicants are welcome for projects carried out at a host institution in Europe (European Union member states and associated countries).

Presented by: Endika Bengoetxea, ERCEA

Registration

Tue Sep 22, 7:00 – 8:00 · Conference Hall “Salocha”

Opening Remarks

Tue Sep 22, 8:00 – 8:15 · Conference Hall “Salocha”

Speaker(s): Marina Dabic (University of Dubrovnik)

Conference Hall “Salocha”

Keynote: Cybersecurity Technology Roadmapping: A Systems Approach for the Challenge

Tue Sep 22, 8:15 – 9:30 · Conference Hall “Salocha”

Chair(s): Marina Dabic (University of Dubrovnik)

Speaker(s): Tugrul Daim (IEEE Transaction on Engineering Management)

Conference Hall “Salocha”

Coffee Break

Tue Sep 22, 9:30 – 10:00

AI-Enabled Requirements & MBSE

Tue Sep 22, 10:00 – 12:30 · Classroom XY3 (3rd fl)

Chair(s): Matthias May (RWTH Aachen University)

Deriving Requirements from Stakeholder Needs Using Large Language Models: An Industrial Proof of Concept

10:00 – 10:20

Classroom XY3 (3rd fl)

Paper ID 1571275015

Author(s): Melih Sah Dogru (Karlsruher Institut für Technologie (KIT) & IPEK - Institute of Product Engineering at KIT); Tobias Düser (Karlsruhe Institute of Technology (KIT) & IPEK - Institute o...)

Speaker(s): Melih Sah Dogru (Karlsruher Institut für Technologie (KIT) & IPEK - Institute of Product Engineering at KIT)

Evaluating Local Large Language Models for Automated Requirement Extraction and SysML v2 Artifact Generation

10:20 – 10:40

Classroom XY3 (3rd fl)

Paper ID 1571275927

Author(s): Sanne Weeger (Hochschule München); Roland Brachmanski (Airbus Defence and Space GmbH); Jens Halbig (Airbus Defence and Space GmbH); Claudio Zuccaro (University of Applied Sciences Munich)

Speaker(s): Sanne Weeger (Hochschule München)

Towards Automated Model-Based Systems Engineering: Artificial Intelligence-Based Generation of Satisfy Relationships Between Requirements and System Model Elements

10:40 – 11:00

Classroom XY3 (3rd fl)

Paper ID 1571275996

Author(s): Matthias May (RWTH Aachen University); Georg Jacobs (RWTH Aachen University); Kathrin Boelsen (RWTH Aachen University); Simon Dehn (RWTH Aachen University)

Speaker(s): Matthias May (RWTH Aachen University)

Integrating MBSE Principles with AI to Improve the Quality of Requirements in SMEs Context

11:00 – 11:20

Classroom XY3 (3rd fl)

Paper ID 1571300346

Author(s): Iryna Volosheniuk (University of Toulouse - Jean Jaurès); Jean-Michel Bruel (University of Toulouse); Claude Baron (LAAS-CNRS)

Speaker(s): Iryna Volosheniuk (University of Toulouse - Jean Jaurès)

Assessing LLMs for (In-)Consistency Detection in Systems Engineering: An Exploratory Case Study

11:20 – 11:40

Classroom XY3 (3rd fl)

Paper ID 1571303324

Author(s): Maximilian Beck (KIT); Vitus Lüntzel (Karlsruhe Institute of Technology); Jonas Boll (Karlsruhe Institute of Technology); Eric Sax (Karlsruhe Institute of Technology)

Speaker(s): Maximilian Beck (KIT)

Digital Twins, AAS & Digital Engineering

Tue Sep 22, 10:00 – 12:30 · Classroom XY4 (4th fl)

Chair(s): Imane Bouhali (SAFRAN)

Digital Twin-Supported System Requirements Specification to Satisfy Dynamic Comfort Constraints in Aircraft Business Class Seats

10:00 – 10:20

Classroom XY4 (4th fl)

Paper ID 1571257697

Author(s): Imane Bouhali (SAFRAN); Luca Palladino (SAFRAN SA); Jacques Martinez (SAFRAN Tech)

Speaker(s): Imane Bouhali (SAFRAN)

Linked Asset Administration Shells Using External Knowledge Graphs

10:20 – 10:40

Classroom XY4 (4th fl)

Paper ID 1571260718

Author(s): Yuanwei Qu (University of Oslo); Martin Skjæveland (University of Oslo); Arild Waaler (University of Oslo); Andreas Schüller (YNCORIS); Eduard Kamburjan (IT University of Copenhagen)

Speaker(s): Yuanwei Qu (University of Oslo)

A Layered Participatory Elicitation Method for MBSE-Based Digital Twin Design

10:40 – 11:00

Classroom XY4 (4th fl)

Paper ID 1571286537

Author(s): Jorge Pérez Garcá (University of Twente); Marcus Vinicius Pereira Pessoa (University of Twente); Sai Mulpuri (University of Twente)

Speaker(s): Jorge Pérez Garcá (University of Twente)

Special Session: Cybernetic Governance and Viable Systems: Engineering Resilience in Complex Systems-of-Systems

Tue Sep 22, 10:00 – 12:30 · Conference Hall “Salocha”

Chair(s): Francesco Caputo (University of Naples Federico II); Igor Perko (WOSC)

Digitalization as a Socio-Technical Catalyst: Do Digital Technology Help the Systemic Governance Possible in Sustainable Tourism Development?

10:00 – 10:20

Conference Hall “Salocha”

Paper ID 1571305661

Author(s): Mario Tani (University of Naples Federico II); Fabiana Sepe (University of Naples Federico II); Giovanna Del Gaudio (University of Naples Federico II); Simone Luongo (Università Pegaso); Gianpaolo Basile (Universitas Mercatorum)

Speaker(s): Mario Tani (University of Naples Federico II)

Navigating Complexity in Systems-of-Systems: A Viable Systems Perspective on Cybernetic Governance and Knowledge-Driven Resilience

10:20 – 10:40

Conference Hall “Salocha”

Paper ID 1571305652

Author(s): Francesco Caputo (University of Naples Federico II); Igor Perko (WOSC); Cristina Cervino (University of Naples Federico II); Maria Giovanna Corrado (University of Naples Federico II)

Speaker(s): Francesco Caputo (University of Naples Federico II)

Content Occupation Insecurity, Skill Acquisition and Career Adapt-Abilities: A Systemic-Vitalist Reading of Learning as an Adaptive Response

10:40 – 11:00

Conference Hall “Salocha”

Paper ID 1571333566

Author(s): Adriana Apuzzo (University of Salerno); Mario Testa (University of Salerno); Alberto Vicente (Universidad Rey Juan Carlos)

Speaker(s): Adriana Apuzzo (University of Salerno)

A Viable Systems Reading of Social-Ecological-Technical Systems-of-Systems: A Governance Model for Sustainability

11:00 – 11:20

Conference Hall “Salocha”

Paper ID 1571335226

Author(s): Mariailuisa Saviano (University of Salerno); Francesco Caputo (University of Naples Federico II); Antonio La Sala (Sapienza University of Rome); Anna Di Vernieri (University of Salerno)

Speaker(s): Anna Di Vernieri (University of Salerno)

SysML v2, Model Transformation & Reuse

Tue Sep 22, 10:00 – 12:30 • Classroom ZY3 (3rd fl)

Chair(s): Zirui Li (Technische Universität Ilmenau)

Cross-Organizational SysML Model Integration: A Survey of Challenges and AI-Supported Tasks

10:00 – 10:20

Classroom ZY3 (3rd fl)

Paper ID 1571255729

Author(s): Zirui Li (Technische Universität Ilmenau); Stephan Husung (Technische Universität Ilmenau); Torsten Brix (Technische Universität Ilmenau)

Speaker(s): Zirui Li (Technische Universität Ilmenau)

A Proof-of-Concept of Model Conversion from SysML v1 to SysML v2 on MBSE Framework

10:20 – 10:40

Classroom ZY3 (3rd fl)

Paper ID 1571279107

Author(s): Samuele Pellegrino (Politecnico di Torino); Francesco Torrigiani (German Aerospace Center (DLR)); Jasper Bussemaker (German Aerospace Center (DLR)); Roberta Fusaro (Politecnico di Torino); Davide Ferretto (Politecnico di Torino); Giacomo Luccisano (Politecnico di Torino)

Speaker(s): Samuele Pellegrino (Politecnico di Torino)

Automated Generation of Custom Views for SysML v2 Models Using Higher-Order Transformations

10:40 – 11:00

Classroom ZY3 (3rd fl)

Paper ID 1571289854

Author(s): Ifrah Qaisar (Mälardalen University); Jan Carlson (Mälardalen University); Robbert Jongling (University of York); Malvina Latifaj (Mälardalen University); Antonio Cicchetti (Mälardalen University); Federico Ciccozzi (Mälardalen University)

Speaker(s): Jan Carlson (Mälardalen University)

Towards Systematic Reuse of MBSE Artifacts: Integrating SysML and Simulation Models with PLE

11:00 – 11:20

Classroom ZY3 (3rd fl)

Paper ID 1571287383

Author(s): Heinrich Wagner (Munich University of Applied Sciences HM); Claudio Zuccaro (University of Applied Sciences Munich); William Cardozo (Knorr-Bremse SFS GmbH)

Speaker(s): Heinrich Wagner (Munich University of Applied Sciences HM)

Systems-of-Systems Architecture & Interoperability

Tue Sep 22, 10:00 – 12:30 • Classroom ZY4 (4th fl)

Chair(s): David Rylander (RISE Research Institutes of Sweden)

Multi-Brand Autonomous Haulage Coordination in Mining: A System-of-Systems Architecture for Interoperability

10:00 – 10:20

Classroom ZY4 (4th fl)

Paper ID 1571278268

Author(s): David Rylander (RISE Research Institutes of Sweden); Jakob Axelsson (Mälardalen University); Pontus Svenson (RISE)

Speaker(s): David Rylander (RISE Research Institutes of Sweden)

Data Sharing Through Event-Driven Context Binding in System-of-Systems

10:20 – 10:40

Classroom ZY4 (4th fl)

Paper ID 1571284211

Author(s): David Rylander (RISE Research Institutes of Sweden); Magnus Andersson (RISE); Pär Hansson (RISE Research Institutes of Sweden AB)

Speaker(s): David Rylander (RISE Research Institutes of Sweden)

A Workflow-Driven Execution Engine for Orchestration of System of Systems

10:40 – 11:00

Classroom ZY4 (4th fl)

Paper ID 1571286882

Author(s): Nicolae-Alexandru Calvun (Mälardalen University); Edgar Ramos (Ericsson Research); Sasikumar Punnekkat (Mälardalens University)

Speaker(s): Nicolae-Alexandru Calvun (Mälardalen University)

Modular Open Systems Approach (MOSA) for Systems-of-Systems (SoS) Architecture

11:00 – 11:20

Classroom ZY4 (4th fl)

Paper ID 1571300444

Author(s): Sarah Rudder (Colorado State University)

Speaker(s): Sarah Rudder (Colorado State University)

Lunch

Tue Sep 22, 12:30 – 14:00 • R&C Academia

AI Assurance, Identity & Trust

Tue Sep 22, 14:10 – 15:40 • Učionica B4

Chair(s): Therese Honda (University of Massachusetts Lowell)

Measuring Evidence Defensibility in Enterprise Security: A Graph-Based Framework for Audit-Resilient Decision Making

14:10 – 14:30

Učionica B4

Paper ID 1571264554

Author(s): Rashmi Tallapragada (DTE Energy)

Speaker(s): Rashmi Tallapragada (DTE Energy)

A Systems Perspective on Identity and Trust: What Do Guns, AI, Social Media, and Autonomous Systems Have in Common?

14:30 – 14:50

Učionica B4

Paper ID 1571273492

Author(s): Therese Honda (University of Massachusetts Lowell)

Speaker(s): Therese Honda (University of Massachusetts Lowell)

Identity-Related Audit Standards for Generative AI Subsystems in Youth-Facing Sociotechnical Architectures

14:50 – 15:10

Učionica B4

Paper ID 1571283199

Author(s): Ljubisa Bojic (University of Belgrade); Funda Ergüleç (Eskişehir Osmangazi University); James O'Higgins Norman (Dublin City University); Joaquín Antonio Mora-Merchán (Universidad de Sevilla); Sedat Uçar (Çukurova University); Dorit Olenik-Shemesh (Open University of Israel); Rosario Del Rey Alamillo (Universidad de Sevilla); Tali Heiman (Open University of Israel); Amalee Meehan (Dublin City University); Tamara Kunic (VERN' University)

Speaker(s): Ljubisa Bojic (University of Belgrade)

AI Governance & Third-Party Risk

Tue Sep 22, 14:10 – 15:40 · Učionica B3

Chair(s): Maria DiValentin (John Deere)

Enabling AI Bill of Materials Through Graph-Structured Metadata: A Model-Based Systems Engineering Approach

14:10 – 14:30

Učionica B3

Paper ID 1571303298

Author(s): Teddy Nyambe (Colorado State University); Maria DiValentin (John Deere); Jeremy Daily (Colorado State University)

Speaker(s): Teddy Nyambe (Colorado State University)

Auditing LLM Red-Teaming Reports: A Vendor-Agnostic Benchmarking Framework for Third-Party Risk Management

14:30 – 14:50

Učionica B3

Paper ID 1571284718

Author(s): Behnam Manavi (IBM); Pyae Hlian Moe (IBM); Filip Boltuzic (Semadot); Joann Ragozzino-Higgins (IBM); Sandeep Reddy (IBM); Vincent Paglioni (Colorado State University)

Speaker(s): Filip Boltuzic (Semadot)

Autonomous Multi-Agent Systems

Tue Sep 22, 14:10 – 15:40 · Učionica B2

Chair(s): Sidney Givigi (Queen's University)

A Simulation-Based Framework for Evaluating Local Coordination Strategies in Drone Fleets

14:10 – 14:30

Učionica B2

Paper ID 1571269908

Author(s): Loïc Lagadec (ENSTA - Institut Polytechnique de Paris); Loïc Plassart (ENSTA); Jannik Laval (Université Lumière Lyon 2, Lyon); Ciprian Teodorov (ENSTA); Charbel Aoun (ICAM)

Speaker(s): Loïc Lagadec (ENSTA - Institut Polytechnique de Paris)

Learning-Guided Task Allocation with Navigation-Aware Optimization for Multi-UAV Missions

14:30 – 14:50

Učionica B2

Paper ID 1571296084

Author(s): Kleber Cabral (Queen's University); Nicolas Lechevin (Defence Research and Development Canada); Camille-Alain Rabbath (Defence R&D Canada); Craig Williams (Royal Military College of Canada); Sidney Givigi (Queen's University)

Speaker(s): Sidney Givigi (Queen's University)

Capture Strategies for Multiple Pursuers and Evaders Using Voronoi Diagrams

14:50 – 15:10

Učionica B2

Paper ID 1571299076

Author(s): Kleber Cabral (Queen's University); Daniel Santos Franco (Queen's University); Sidney Givigi (Queen's University)

Speaker(s): Sidney Givigi (Queen's University)

Robotics & Autonomous Control

Tue Sep 22, 14:10 – 15:40 • Učionica E2

Chair(s): Ricardo Sanz (Universidad Politécnica de Madrid)

Novel Cascaded Model-Predictive Trajectory Control for Underactuated Non-Linear Systems

14:10 – 14:30

Učionica E2

Paper ID 1571303356

Author(s): Marian Göllner (Ostfalia University of Applied Sciences); Xiaobo Liu-Henke (Ostfalia University of Applied Sciences)

Speaker(s): Marian Göllner (Ostfalia University of Applied Sciences)

A Systems-Oriented Formalization of Affordances for Autonomous Tool Invention

14:30 – 14:50

Učionica E2

Paper ID 1571303425

Author(s): Ruth Medeiros (Universidad Politécnica de Madrid); Virgilio Gomez (Universidad Politécnica de Madrid); Ricardo Sanz (Universidad Politécnica de Madrid)

Speaker(s): Ricardo Sanz (Universidad Politécnica de Madrid)

A Methodology for Solving Multi-Robotic System Missions Based on Cellular Sheaves

14:50 – 15:10

Učionica E2

Paper ID 1571303461

Author(s): Philipp Ahrendt (ISAE-Supméca); Mehdi Mcharek (ESTACA); Moncef Hammadi (ISAE-SUPMECA); Stéphane Dugowson (ISAE-Supméca)

Speaker(s): Philipp Ahrendt (ISAE-Supméca)

Special Session: Strategic Management of Complex and Regulated Systems: Interplay of Market and Non- Market Forces

Tue Sep 22, 14:10 – 15:40 • E1 Veliki Amphitheater

Chair(s): Dubravko Sabolić (Croatian Transmission System Operator); Murat Akpinar (JAMK University of Applied Sciences)

Strategic Management of IT/OT Systems in Highly Regulated Power Systems

14:10 – 14:30

E1 Veliki Amphitheater

Paper ID 1571279164

Author(s): Renata Rubeša (Croatian Transmission System Operator); Igor Ivankovic (Croatian Transmission System Operator, HOPS); Ana Kekelj (HOPS); Gordana Donković (Croatian Transmission System Operator)

Speaker(s): Renata Rubeša (Croatian Transmission System Operator)

Negative Electricity Prices as a Strategic Outcome of Policy Design: Managing the Interplay Between Market and Non-Market Forces in EU Power Systems

14:30 – 14:50

E1 Veliki Amphitheater

Paper ID 1571285143

Author(s): Goran Slipac (HRO CIGRE)

Speaker(s): Goran Slipac (HRO CIGRE)

Assessing Firm-Level Sustainable Competitiveness: A New Framework and Its Application

14:50 – 15:10

E1 Veliki Amphitheater

Paper ID 1571262587

Author(s): Melike Mermercioglu (Koç University); Murat Akpinar (JAMK University of Applied Sciences)

Speaker(s): Melike Mermercioglu (Koç University)

Coffee Break

Tue Sep 22, 15:40 – 16:00 • Corridor Outside E1 Veliki

Automotive Software & Cybersecurity

Tue Sep 22, 16:00 – 17:30 • Učionica B3

Chair(s): Jacqueline Henle (FZI Research Center for Information Technology)

Designing a Reference Process for Regulatory Compliance: The Case of Automotive Software Update Management Systems

16:00 – 16:20

Učionica B3

Paper ID 1571285922

Author(s): Jacqueline Henle (FZI Research Center for Information Technology); Tobias Schuermann (FZI Forschungszentrum Informatik); Eric Sax (FZI Research Center for Information Technology); Stefan Otten (FZI Research Center for Information Technology)

Speaker(s): Jacqueline Henle (FZI Research Center for Information Technology)

Designing CI/CD Pipelines for Automotive Software Updates: A Socio-Technical Framework

16:20 – 16:40

Učionica B3

Paper ID 1571287342

Author(s): Ann-Therese Nägele (Karlsruhe Institute of Technology); Eric Sax (Karlsruhe Institute of Technology)

Speaker(s): Ann-Therese Nägele (Karlsruhe Institute of Technology)

Comparative Threat Analysis and Risk Assessment of an Emergency Braking System Across Regional Automotive Cybersecurity Practices

16:40 – 17:00

Učionica B3

Paper ID 1571286929

Author(s): Nikola Lukeži (Karlsruhe Institut of Technology); Vitus Lüntzel (Karlsruhe Institute of Technology); Daniel Baumann (Karlsruhe Institut of Technology); Eric Sax (Karlsruhe Institute of Technology)

Speaker(s): Nikola Lukeži (Karlsruhe Institut of Technology)

Connected Mobility & Transportation Optimization

Tue Sep 22, 16:00 – 17:30 • Učionica B2

Chair(s): Sc. Tech. Nikica Perić (University of Zagreb)

SOA2X: Towards Seamless Service Integration in Vehicular Edge Computing

16:00 – 16:20

Učionica B2

Paper ID 1571285362

Author(s): David Kraus (Karlsruhe Institute of Technology); Marc Schindewolf (Karlsruhe Institute of Technology); Eric Sax (Karlsruhe Institute of Technology)

Speaker(s): David Kraus (Karlsruhe Institute of Technology)

Traffic Orchestration as a System of Systems

16:20 – 16:40

Učionica B2

Paper ID 1571286190

Author(s): Pontus Svenson (RISE); Sara Janhäll (RISE Research Institutes of Sweden); Terese Besker (RISE Research Institutes of Sweden)

Speaker(s): Pontus Svenson (RISE)

Vehicle Routing Optimization on a Real-World Multi-City Benchmark

16:40 – 17:00

Učionica B2

Paper ID 1571294539

Author(s): Sc. Tech. Nikica Perić (University of Zagreb); Hrvoje Novak (University of Zagreb); Vinko Lešić (University of Zagreb, Faculty of Electrical Engineering and Computing); Jeff Bray (Bournemouth University); Hans De Steur (Universiteit Gent); Maxime Michaud (Institut Lyfe Research and Innovation Centre); Djamel Rahmani (Universitat Politècnica de Catalunya); Adam Tarcsi (Eötvös Loránd University); Barbara Ronge (Ronge and Partner GmbH)

Speaker(s): Sc. Tech. Nikica Perić (University of Zagreb)

Knowledge Graphs, Ontologies & Semantic Engineering

Tue Sep 22, 16:00 – 17:30 · Učionica B4

Chair(s): Louis Brial (Airbus Defence and Space)

Semantic-Type-Aware Transformation of Biomedical Text into Graph Intermediate Representations

16:00 – 16:20

Učionica B4

Paper ID 1571286930

Author(s): MingHao Wang (Tokushima University); Xin Kang (Tokushima University); Veronika Shteingardt (Technion - Israel Institute of Technology); Dov Dori (Technion, Israel Institute of Technology)

Speaker(s): Veronika Shteingardt (Technion - Israel Institute of Technology)

Assessing Ontology Mapping via Functorial Coverage in a Category-Theoretic Framework

16:20 – 16:40

Učionica B4

Paper ID 1571300980

Author(s): Louis Brial (Airbus Defence and Space); Dominique Ernadote (Airbus Defence and Space); Gaspard Berthelin (Airbus Defence and Space); Nicolas Sarda (Airbus Defence and Space SAS)

Speaker(s): Louis Brial (Airbus Defence and Space)

Simulation, Testing & Verification

Tue Sep 22, 16:00 – 17:30 · Učionica E2

Chair(s): Jonas Freyer (Karlsruhe Institute of Technology)

Model-Based Credibility Assessment of Simulation Test Systems Using SysML v2: Application to a Closed-Loop ACC Case Study

16:00 – 16:20

Učionica E2

Paper ID 1571262509

Author(s): Jonas Freyer (Karlsruhe Institute of Technology); Ruben Knappstein (Karlsruhe Institute of Technology (KIT)); Hyunjin Park (MORAI Inc.); Jiwon Jung (MORAI Inc.); Katharina Bause (Karlsruhe Institute of Technology (KIT)); Tobias Düser (Karlsruhe Institute of Technology (KIT) & IPEK - Institute o...)

Speaker(s): Jonas Freyer (Karlsruhe Institute of Technology)

A Deterministic Framework for LLM-Assisted Road Generation for Scenario-Based Testing

16:20 – 16:40

Učionica E2

Paper ID 1571275235

Author(s): Taihao Li (Ostfalia University of Applied Sciences); Robin Bruns (Ostfalia University of Applied Sciences); Xiaobo Liu-Henke (Ostfalia University of Applied Sciences)

Speaker(s): Taihao Li (Ostfalia University of Applied Sciences)

A Model-Driven State Machine Framework for Automated Verification of Digital Substations

16:40 – 17:00

Učionica E2

Paper ID 1571301116

Author(s): Marco D'Onofrio (K.U. Leuven); Rick Loenders (KU Leuven); Geraint Chaffey (KU Leuven); Dirk Van Hertem (ESAT -- KU Leuven)

Speaker(s): Marco D'Onofrio (K.U. Leuven)

Special Session: Strategic Management of Complex and Regulated Systems: Interplay of Market and Non- Market Forces (Cont'd)

Tue Sep 22, 16:00 – 17:30 · E1 Veliki Amphitheater

Chair(s): Dubravko Sabolić (Croatian Transmission System Operator); Murat Akpinar (JAMK University of Applied Sciences)

From Operational Response to Strategic Resilience in Regulated Infrastructure Systems

16:00 – 16:20

E1 Veliki Amphitheater

Paper ID 1571300258

Author(s): Dubravko Sabolić (Croatian Transmission System Operator); Tonči Prodan (University of Split)

Speaker(s): Dubravko Sabolić (Croatian Transmission System Operator)

Digital Governance of Consumer-Centered Repair Ecosystems in Circular Economy Systems

16:20 – 16:40

E1 Veliki Amphitheater

Paper ID 1571305428

Author(s): Karina Guadalupe Coronado Apodaca (Tecnológico de Monterrey Campus Guadalajara); Kosjenka Dumančić (University of Zagreb); Natacha Silva (UNIAG, Instituto Politécnico de Bragança); Dubravko Sabolić (Croatian Transmission System Operator)

Speaker(s): Dubravko Sabolić (Croatian Transmission System Operator)

The Neuro-Symbolic Imperative for Trustworthy AI in Enterprise Communications

16:40 – 17:00

E1 Veliki Amphitheater

Paper ID 1571305455

Author(s): Marko Horvat (University of Zagreb); Gordan Gledec (University of Zagreb); Marko Delimar (University of Zagreb)

Speaker(s): Marko Horvat (University of Zagreb)

Welcome Reception

Tue Sep 22, 18:00 – 19:00 · R&C Academia

Registration

Wed Sep 23, 7:30 – 8:00 • Corridor Outside E1 Veliki

Keynote: Engineering Sustainable and Intelligent Systems: Leveraging AI, Digital Supply Chains and Circular Economy for Industrial Transformation

Wed Sep 23, 8:00 – 9:30 • E1 Veliki Amphitheater

Chair(s): Marina Dabic (University of Dubrovnik)

Speaker(s): Vikas Kumar (University of Portsmouth)

E1 Veliki Amphitheater

Coffee Break

Wed Sep 23, 9:30 – 10:00 • Corridor Outside E1 Veliki

Student Poster Session

Wed Sep 23, 9:30 – 10:00 • Corridor Outside E1 Veliki

Students should hang their posters between 8:00 AM and 9:30 AM on September 23. Between 9:30 - 10:00 AM authors should stand at their posters prepared to discuss. Judges will be circulating at that time. All posters should be removed by 4:30. Any remaining after 4:30 PM will be discarded. Poster winners will be announced at the dinner.

Chair(s): Prasanta Ghosh

Identity, Authentication, and Delegated Authorization for AI Agents: A Survey of Emerging Standards, Threats, and Open Challenges

9:30 – 10:00

Corridor Outside E1 Veliki

Paper ID 1571319823

Author(s): Nouba-Asra Goursam Tresor (Carnegie Mellon University); Yeboah Yacoba Oduro (Carnegie Mellon University)

Speaker(s): Nouba-Asra Goursam Tresor (Carnegie Mellon University)

Smart building predictive control based on IoT sensors data

9:30 – 10:00

Corridor Outside E1 Veliki

Paper ID 1571321498

Author(s): Mihael Ratkovčić (University of Zagreb); Vinko Lešić (University of Zagreb, Faculty of Electrical Engineering and Computing)

Speaker(s): Mihael Ratkovčić (University of Zagreb)

To What Extent is an Assurance Framework the Most Effective Solution for the Business Unit (BU)?

9:30 – 10:00

Corridor Outside E1 Veliki

Paper ID 1571323186

Author(s): Kathrynne Rainey (Cranfield University)

Speaker(s): Kathrynne Rainey (Cranfield University)

Applying Minimum Viable Systems Engineering to CubeSat Development: A Practical Implementation Using Spicy SE

9:30 – 10:00

Corridor Outside E1 Veliki

Paper ID 1571323614

Author(s): Satya Sree Rupa Rallabandi (Universität Bremen)

Speaker(s): Satya Sree Rupa Rallabandi (Universität Bremen)

A Multimodal Voice and Vision Architecture for Safe Natural Language Control of ROS 2 Mobile Robots

9:30 – 10:00

Corridor Outside E1 Veliki

Paper ID 1571324466

Author(s): Marko Šimić (University of Zagreb)

Speaker(s): Marko Šimić (University of Zagreb)

Machine Learning-Based Correction of Weather Forecasts for Photovoltaic Applications with Conformal Uncertainty Quantification

9:30 – 10:00

Corridor Outside E1 Veliki

Paper ID 1571324701

Author(s): Jalil Akbar Zai (University of Zagreb); Hrvoje Novak (University of Zagreb)

Speaker(s): Jalil Akbar Zai (University of Zagreb)

Optimal Sizing and Machine Learning-Based Real-Time Control of a Renewable Hydrogen Hub

9:30 – 10:00

Corridor Outside E1 Veliki

Paper ID 1571324837

Author(s): Maryam Adib-Basmenj (University of Zagreb); Mario Vašak (University of Zagreb Faculty of Electrical Engineering and Computing)

Speaker(s): Maryam Adib-Basmenj (University of Zagreb)

Nexus Risk Intelligence: A Neuro-Symbolic Framework for Portfolio-Level Risk Management in Aerospace Multi-Programme Environments

9:30 – 10:00

Corridor Outside E1 Veliki

Paper ID 1571325003

Author(s): Satya Sree Rupa Rallabandi (Universität Bremen); Shivang Patni (University of Bremen); Celia Boutalbi (University of Bremen); Revathi Chandrasekaran (University of Bremen)

Speaker(s): Satya Sree Rupa Rallabandi (Universität Bremen)

A Conditional Evaluation of Physics-Informed and Data-Driven Models for Short-Term Photovoltaic Power Forecasting

9:30 – 10:00

Corridor Outside E1 Veliki

Paper ID 1571325004

Author(s): Nada Tamer Abdelhay Abdellatif (University of Zagreb); Hrvoje Novak (University of Zagreb); Mario Vašak (University of Zagreb)

Speaker(s): Nada Tamer Abdelhay Abdellatif (University of Zagreb)

Optical fiber-based bending detection using interrupted fiber segments

9:30 – 10:00

Corridor Outside E1 Veliki

Paper ID 1571325006

Author(s): Teo Putarek (University of Zagreb); Matko Orsag (University of Zagreb)

Speaker(s): Teo Putarek (University of Zagreb)

Are Foundation Models Worth Their Cost for Solar Power Forecasting? An Accuracy-Cost Benchmark for Photovoltaic Systems

9:30 – 10:00

Corridor Outside E1 Veliki

Paper ID 1571325049

Author(s): Vansh Sethi (University of Zagreb)

Speaker(s): Vansh Sethi (University of Zagreb)

Multimodal agent system for monitoring and coordination of an autonomous drone fleet

9:30 – 10:00

Corridor Outside E1 Veliki

Paper ID 1571327940

Author(s): Dino Lovric (University of Zagreb); Leo Sikirić (University of Zagreb); Antonella Barisic Kulas (University of Zagreb); Stjepan Bogdan (University of Zagreb)

Speaker(s): Dino Lovric (University of Zagreb)

Short-Term Load Forecasting of the Croatian Power System Using Machine Learning

9:30 – 10:00

Corridor Outside E1 Veliki

Paper ID 1571327953

Author(s): Anita Banjac (University of Zagreb); Bruno Di Giusto (University of Zagreb)

Speaker(s): Bruno Di Giusto (University of Zagreb)

Energy Systems & Grid Resilience

Wed Sep 23, 10:00 – 12:30 · Učionica B3

Chair(s): Filip Rukavina (University of Zagreb)

Web-Based Application for Optimal Sizing and Economic Evaluation of PV+Battery Systems

10:00 – 10:20

Učionica B3

Paper ID 1571286374

Author(s): Filip Rukavina (University of Zagreb); Filip Smolić (University of Zagreb); Anita Banjac (University of Zagreb); Mario Vašak (University of Zagreb)

Speaker(s): Filip Rukavina (University of Zagreb)

Energy Management of Fuel-Cell-Range-Extender Buses Based on Reinforcement Learning and Equivalent Fuel Consumption Minimization Strategy

10:20 – 10:40

Učionica B3

Paper ID 1571287326

Author(s): Carolin Schiefer (Karlsruhe Institute of Technology); Eric Sax (Karlsruhe Institute of Technology)

Speaker(s): Carolin Schiefer (Karlsruhe Institute of Technology)

A CIM Multi-Repository Architecture for Heterogeneous Power System Data

10:40 – 11:00

Učionica B3

Paper ID 1571303892

Author(s): Domagoj Peharda (Končar - Digital); Tomislav Stupić (Končar - Digital); Tin Novosel (Končar - Digital)

Speaker(s): Domagoj Peharda (Končar - Digital)

Risk Analysis & Multi-Hazard Resilience

Wed Sep 23, 10:00 – 12:30 · Učionica B2

Chair(s): Carl Akira King (Aalto University)

Risk Analysis Methods for Complex Systems and Systems of Systems: A Systematic Mapping Study

10:00 – 10:20

Učionica B2

Paper ID 1571286178

Author(s): Marjorie Nawila Pettersson (Mälardalen University); Jakob Axelsson (Mälardalen University); Anna Johansson (Mälardalen University); Pontus Svenson (RISE)

Speaker(s): Marjorie Nawila Pettersson (Mälardalen University)

Identifying Loss Scenarios for System-Theoretic Process Analysis with Large Language Models

10:20 – 10:40

Učionica B2

Paper ID 1571303268

Author(s): Carl Akira King (Aalto University); Giordano Lilli (Istituto Nazionale di Fisica Nucleare); Valeriy Vyatkin (Luleå University of Technology)

Speaker(s): Carl Akira King (Aalto University)

A Multi-Hazard Dependency Framework for Alpine Energy-Digital-Transport Systems: Insights from Ice Storm, Flood, and Space Weather Scenarios

10:40 – 11:00

Učionica B2

Paper ID 1571303293

Author(s): Valerij Grasic (Telekom Slovenije)

Speaker(s): Valerij Grasic (Telekom Slovenije)

Space & Aerospace Systems Engineering

Wed Sep 23, 10:00 – 12:30 · Učionica B4

Chair(s): Takenori Maeda (Keio university)

Proposal for a Development Method for Rockets Based on Extended Multi-Risk Assessment Using Causal Loop Analysis and Ilities

10:00 – 10:20

Učionica B4

Paper ID 1571287150

Author(s): Takenori Maeda (Keio university)

Speaker(s): Takenori Maeda (Keio university)

Proposal for a Collaborative Approach Between Systems Engineers and Generative AI for MBSE in Rocket System Development

10:20 – 10:40

Učionica B4

Paper ID 1571287307

Author(s): Takenori Maeda (Keio university)

Speaker(s): Takenori Maeda (Keio university)

A Needs Analysis Method for Earth Observation Satellite Systems

10:40 – 11:00

Učionica B4

Paper ID 1571287341

Author(s): Shungo Nishikawa (Japan Aerospace Exploration Agency); Hiroki Umeda (Japan Aerospace Exploration Agency); Hiroto Kikuchi (Japan Aerospace Exploration Agency); Yasushi Ueda (Japan Aerospace Exploration Agency); Shuji Morisaki (Nagoya University)

Speaker(s): Shungo Nishikawa (Japan Aerospace Exploration Agency)

Systems Engineering Practice, Adoption & Quality

Wed Sep 23, 10:00 – 12:30 · Učionica E2

Chair(s): Mijalche Santa (St.Cyril and Methodius University)

Practices for Overcoming Persistent Problems in Individual Information Systems Development: A Contribution to Alternative ISD Approaches

10:00 – 10:20

Učionica E2

Paper ID 1571283497

Author(s): Mijalche Santa (St.Cyril and Methodius University); Sara Simunoska (Ss Cyril and Methodius University in Skopje)

Speaker(s): Mijalche Santa (St.Cyril and Methodius University)

How Do a Set of Critical Success Factors Impact Software Projects Success?

10:20 – 10:40

Učionica E2

Paper ID 1571285358

Author(s): Reda Naddam (Laboratory for Analysis and Architecture of Systems - CNRS); Claude Baron (LAAS-CNRS); Yann Argotti (Renault Group)

Speaker(s): Reda Naddam (Laboratory for Analysis and Architecture of Systems - CNRS)

Boundary Artifacts in Interdisciplinary Engineering: Conceptualizing Rosetta Stones Between Domains

10:40 – 11:00

Učionica E2

Paper ID 1571286273

Author(s): Thomas Voelk (Karlsruhe Institute of Technology (KIT)); Razieh Dehghani (Karlsruhe Institute of Technology (KIT)); Henriette Färber (Karlsruhe Institute of Technology (KIT)); Stefan Schwarz (Karlsruhe Institute of Technology (KIT)); Romain Pascual (MICS, CentraleSupélec, Université Paris-Saclay); Lars Gesmann (Karlsruhe Institute of Technology (KIT)); Arne Lange (Karlsruhe Institute of Technology (KIT)); Terru Stübinger (Karlsruhe Institute of Technology (KIT)); Mattias Ulbrich (Karlsruhe Institute of Technology (KIT)); Tobias Düser (Karlsruhe Institute of Technology (KIT) & IPEK - Institute of Product Engineering at KIT); Anne Koziol (Karlsruhe Institute of Technology (KIT)); Albert Albers (Karlsruhe Institute of Technology (KIT)); Leow Zi Le (Karlsruhe Institute of Technology (KIT)); Melih Sah Dogru (Karlsruher Institut für Technologie (KIT) & IPEK - Institute of Product Engineering at KIT)

Speaker(s): Melih Sah Dogru (Karlsruher Institut für Technologie (KIT) & IPEK - Institute of Product Engineering at KIT)

Supporting Systems Engineering Adoption in SMEs and Micro-Enterprises Through the SPICE-SE Tool

11:00 – 11:20

Učionica E2

Paper ID 1571286369

Author(s): *Aliaga Baptiste (CNRS); Claude Baron (LAAS-CNRS)*

Speaker(s): *Aliaga Baptiste (CNRS)*

Bridging Systems- and Software Engineering: Lessons learned from High-Tech Companies

11:20 – 11:40

Učionica E2

Paper ID 1571300881

Author(s): *Alexandr Vasenev (TNO); Richard Doornbos (TNO); Pieter Goosen (TNO-ESI); Joana Teixeira (TNO-ESI); Laura Veen (TNO); Johan Lukkien (Eindhoven University of Technology)*

Speaker(s): *Alexandr Vasenev (TNO)*

Lunch

Wed Sep 23, 12:30 – 14:00 · R&C Academia

AI Applications & Intelligent Interfaces

Wed Sep 23, 14:10 – 15:40 · Učionica E2

Chair(s): *Marina Bagic Babac (University of Zagreb)*

Design and Evaluation of a Modular MCP-Based Architecture for Real-Time RAG-Enabled Fact-Checking Systems

14:10 – 14:30

Učionica E2

Paper ID 1571262268

Author(s): *Daria Bevanda (University of Zagreb); Fran Talan (University of Zagreb); Jakov Vиноžganić (University of Zagreb); Marina Bagic Babac (University of Zagreb)*

Speaker(s): *Marina Bagic Babac (University of Zagreb)*

Automotive MBSE & E/E Architecture

Wed Sep 23, 14:10 – 15:40 · Učionica B4

Chair(s): *Carina Freseman (Technische Universität Berlin)*

Integration of Model-Based Systems Engineering and Software Defined Vehicle Approaches via Synchronization Points During Product Development

14:10 – 14:30

Učionica B4

Paper ID 1571286416

Author(s): *Carina Freseman (Technische Universität Berlin); Jens Lachenmaier (Ferdinand-Steinbeis-Institut); Dirk Slama (Robert-Bosch GmbH and Ferdinand-Steinbeis-Institute); Rainer Stark (TU Berlin)*

Speaker(s): *Carina Freseman (Technische Universität Berlin)*

Cross-Organizational System Architecture Development for Software-Defined Vehicles (SDVs)

14:30 – 14:50

Učionica B4

Paper ID 1571286670

Author(s): *Nicole Kechler (Karlsruhe Institute of Technology); Jacqueline Henle (FZI Research Center for Information Technology); Eric Sax (Karlsruhe Institute of Technology)*

Speaker(s): *Nicole Kechler (Karlsruhe Institute of Technology)*

Functional Path-Based Decomposition for Multi-Objective Optimization of Automotive E/E Architectures in MBSE Environments

14:50 – 15:10

Učionica B4

Paper ID 1571287319

Author(s): Kurdiya Atalan (Technische Universität Ilmenau); Stephan Husung (Technische Universität Ilmenau); Nils Feyerabend (Volkswagen AG)

Speaker(s): Kurdiya Atalan (Technische Universität Ilmenau)

Security, Privacy & Trusted Systems

Wed Sep 23, 14:10 – 15:40 · Učionica B2

Chair(s): Davis Loose (University of Virginia)

Private off-Chain Resource Tracking and Orchestration: An Actor-Model Approach to Zero-Knowledge Computation

14:10 – 14:30

Učionica B2

Paper ID 1571280992

Author(s): Pradeeban Kathiravelu (University of Alaska Anchorage); Tihana Galinac Grbac (Juraj Dobrila University of Pula)

Speaker(s): Tihana Galinac Grbac (Juraj Dobrila University of Pula)

Addressing Security Issues in the Smart Home: A Hardware and Software Co-Engineering Approach

14:30 – 14:50

Učionica B2

Paper ID 1571300305

Author(s): Tolga Arul (Barkhausen Institut); Nico Mexis (University of Passau); Jan Bambach (TU Darmstadt); Shuai Chen (Southeast University); Stavros Stavrinides (International Hellenic University); Mario Dudjak (Faculty of Electrical Engineering, Computer Science and Information Technology Osijek); Nikolaos Athanasios Anagnostopoulos (Universität Passau)

Speaker(s): Nikolaos Athanasios Anagnostopoulos (Universität Passau)

Self-Powered Sensors Enabling Mission Level Trust in Logistics Systems and Supply Chains

14:50 – 15:10

Učionica B2

Paper ID 1571287316

Author(s): Davis Loose (University of Virginia); Benton Calhoun (University of Virginia); Daniel S. Truesdell (University of Virginia); Megan Marcellin (University of Virginia); Megan Gunn (University of Virginia); Matthew Gunn (University of Virginia); Thomas Polmateer (University of Virginia); Igor Linkov; James Lambert (UVa)

Speaker(s): Davis Loose (University of Virginia)

Strategic Management & Organizational Agility

Wed Sep 23, 14:10 – 15:40 · Učionica B3

Chair(s): Ertugrul Bayraktar (Yildiz Technical University)

Strategic Foresight as an Institutional Engine for Deep-Tech Responsive Higher Education Institutions

14:10 – 14:30

Učionica B3

Paper ID 1571303171

Author(s): Ertugrul Bayraktar (Yildiz Technical University); Onurcan Sahin (Yildiz Technical University); Mila Velkovska (Ss.Cyril and Methodius University in Skopje); Wilfried Rulands (Magdeburg Stendal University of Applied Sciences); Marjan Nikolovski (THE NEW WAY); Arvids Barsevskis (Daugavpils University); Valentina Gecevska (Ss.Cyril and Methodius University in Skopje); Michael Herzog (Magdeburg Stendal University of Applied Sciences); Huseyin Uvet (Yildiz Technical University)

Speaker(s): Ertugrul Bayraktar (Yildiz Technical University)

Strategic Agility in Action: Dynamic Portfolio Strategy Processes

14:30 – 14:50

Učionica B3

Paper ID 1571332251

Author(s): Julia Gohlke (Handelshochschule Leipzig); Lysander Weiß (HHL Leipzig); Dominik Kanbach (Handelshochschule Leipzig)

Speaker(s): Julia Gohlke (Handelshochschule Leipzig)

Coffee Break

Wed Sep 23, 15:40 – 16:00 · Corridor Outside E1 Veliki

Data Engineering & Machine Learning Pipelines

Wed Sep 23, 16:00 – 17:30 · Učionica B3

Chair(s): Philipp Reis (FZI Forschungszentrum Informatik)

From Big Data to Fast Data: High-Quality Datasets for Machine Learning via Closed-Loop Collection

16:00 – 16:20

Učionica B3

Paper ID 1571274876

Author(s): Philipp Reis (FZI Forschungszentrum Informatik); Jacqueline Henle (FZI Research Center for Information Technology); Stefan Otten (FZI Research Center for Information Technology); Eric Sax (FZI Research Center for Information Technology); Tobias Schuermann (FZI Forschungszentrum Informatik)

Speaker(s): Philipp Reis (FZI Forschungszentrum Informatik)

Self-Healing Data Integration Pipelines via Artificial Intelligence and Human-in-the-Loop Optimization

16:20 – 16:40

Učionica B3

Paper ID 1571286160

Author(s): Spyridon Evangelatos (National and Kapodistrian University of Athens); Panagiotis Matzakos (Netcompany SA); George Bardas (Netcompany-Intrasoft); Themistokis Anagnostopoulos (Netcompany SA); George Lalas (Netcompany SA); Pantelis Lappas (University of the Aegean)

Speaker(s): Spyridon Evangelatos (National and Kapodistrian University of Athens)

Probabilistic Anomaly Scoring for Multivariate Time-Series Detection

16:40 – 17:00

Učionica B3

Paper ID 1571303514

Author(s): Saba Sanami (Concordia University); Amir Aghdam (Concordia University Canada)

Speaker(s): Amir Aghdam (Concordia University Canada)

Energy Markets, Coordination & Business Models

Wed Sep 23, 16:00 – 17:30 · Učionica B4

Chair(s): Dubravko Sabolić (Croatian Transmission System Operator)

Ex Post Coordination in System-of-Systems: The Case of the EU ITC Mechanism

16:00 – 16:20

Učionica B4

Paper ID 1571289984

Author(s): Patricia Lončar (University of Zagreb); Dubravko Sabolić (Croatian Transmission System Operator)

Speaker(s): Dubravko Sabolić (Croatian Transmission System Operator)

Battery as a Service: Challenges from the Field and Trajectory for Future Research

16:20 – 16:40

Učionica B4

Paper ID 1571321539

Author(s): Sesaria Kikitamara (Centre for E-Mobility and Clean Growth, Coventry University); Benny Tjahjono (Coventry University)

Speaker(s): Benny Tjahjono (Coventry University)

Hyperscale GPU Manufacturing Screening: Scalable Defect Detection and Health Monitoring

16:40 – 17:00

Učionica B4

Paper ID 1571275393

Author(s): Soumya Padmanabha (Meta); Pankaj Agnihotri (Meta Platforms Inc.); Zhenxuan Zhang (Meta Platforms Inc.); Gautam Nandkishore Nayak (Meta)

Speaker(s): Soumya Padmanabha (Meta)

Sustainability & Socio-Technical Governance

Wed Sep 23, 16:00 – 17:30 · Učionica B2

Chair(s): Fuad Adegoke (University of Lagos)

A Systems Engineering Framework for Improving Urban Water Access in Low-Income Communities

16:00 – 16:20

Učionica B2

Paper ID 1571332004

Author(s): Fuad Adegoke (University of Lagos)

Speaker(s): Fuad Adegoke (University of Lagos)

Integrated Guardrails for Unbiased and Adaptive Neural Network Architectures

16:20 – 16:40

Učionica B2

Paper ID 1571269023

Author(s): Pradeeban Kathiravelu (University of Alaska Anchorage); Tihana Galinac Grbac (Juraj Dobrila University of Pula)

Speaker(s): Tihana Galinac Grbac (Juraj Dobrila University of Pula)

Dinner & Awards

Wed Sep 23, 18:00 – 20:00 · R&C Academia

Registration

Thu Sep 24, 8:00 – 8:30 · Corridor Outside E1 Veliki

Advanced MBSE, MDAO & Model Evaluation

Thu Sep 24, 8:30 – 10:00 · Učionica B4

Chair(s): Sean Huang (University of Toronto)

An MBSE-SysML v2 and GenAI-Based Workflow for MDAO-Oriented Architecture

8:30 – 8:50

Učionica B4

Paper ID 1571271765

Author(s): Zuoying Lu (DISP Lab); Tianxiao Xu (Université Lumière Lyon 2); Mohand-Lounes Bentaha (Université Lumière Lyon 2); Nejib MOALLA (Université Lumière Lyon 2 - DISP Lab); Giuseppe Cereda (IVECO SPA); Claudia Agostinelli (IVECO SPA)

Speaker(s): Zuoying Lu (DISP Lab)

Integration of Model-Based Systems Engineering with Multidisciplinary Design Analysis and Optimization: A Literature Review

8:50 – 9:10

Učionica B4

Paper ID 1571286674

Author(s): Sean Huang (University of Toronto); Thomas Robert (Safran Landing Systems); Jordan Epp (Safran Landing Systems); Alison Olechowski (University of Toronto)

Speaker(s): Sean Huang (University of Toronto)

Agent-Based Evaluation of Conceptual Models in Model-Based Systems Engineering

9:10 – 9:30

Učionica B4

Paper ID 1571287362

Author(s): Veronika Shteingardt (Technion - Israel Institute of Technology); Dov Dori (Technion, Israel Institute of Technology)

Speaker(s): Veronika Shteingardt (Technion - Israel Institute of Technology)

Complexity, Systems Thinking & Engineering Education

Thu Sep 24, 8:30 – 10:00 · Učionica B2

Chair(s): Torsten Boecker (BMW Group Research and Technology)

A Conceptual Framework for the Operationalization of Complexity in Systems Engineering

8:30 – 8:50

Učionica B2

Paper ID 1571287338

Author(s): Torsten Boecker (BMW Group Research and Technology)

Speaker(s): Torsten Boecker (BMW Group Research and Technology)

A Systems Thinking Approach to Quality Management in Web-Based Information Systems

8:50 – 9:10

Učionica B2

Paper ID 1571291844

Author(s): Andrea Bednjanec (Zagreb University of Applied Sciences); Lidija Golubic (Zagreb University of Applied Sciences); Vatroslav Bakša (Zagreb University of Applied Sciences)

Speaker(s): Magdalena Bednjanec (Zagreb University of Applied Sciences)

Ethics Education for System Engineers in Preparation for the Dynamic Workplace Environment

9:10 – 9:30

Učionica B2

Paper ID 1571284701

Speaker(s): Prasanta Ghosh

Special Session Panel: Engineering Resilient Power Systems-of-Systems Under the Green Transition: Architectural, Operational, and Market Challenges

Thu Sep 24, 8:30 – 12:30 · E1 Veliki Amphitheater

This session is designed as a structured track combining short framing interventions with moderated expert panel discussions, rather than a session of conference paper presentations. The format is intended to encourage technically rigorous exchange while maintaining thematic coherence and supporting interactive discussion between panelists and the audience.

The green transition represents not only a technological substitution process, but a large-scale reconfiguration of a continental socio-technical system-of-systems. Power systems are evolving from inertia-dominated, centrally controlled architectures toward converter-based, digitally mediated, and market-coupled infrastructures. This transformation introduces new forms of emergent behavior, cross-layer interactions, and systemic risk that cannot be adequately understood through isolated technical or economic lenses alone.

Addressing these challenges requires explicit systems thinking—recognizing the interdependence of physical infrastructure, digital control layers, market design, regulatory frameworks, and societal expectations. The session examines this ongoing transformation from a systems engineering perspective, integrating architectural design, operational stability, market mechanisms, and regulatory structures within a unified resilience-oriented framework.

In recent years, this transformation has coincided with a visible increase in the frequency, severity, and societal impact of large-scale disturbances and blackouts, particularly in highly interconnected and market-oriented environments, revealing emerging systemic vulnerabilities associated with reduced synchronous inertia, declining system strength, high penetration of power-electronic interfaced resources, and tight cross-border coupling. Similar phenomena have been observed globally, with major outages in North America, Australia, South America, and parts of Asia demonstrating how rapidly converter-dominated systems can transition from normal operation to widespread collapse within seconds.

Within this changing landscape, new categories of system actors are gaining prominence. Large electricity consumers equipped with advanced power-electronic interfaces—such as hyperscale data centers—are becoming significant dynamic participants in the power system. Although not generators in the traditional sense, their scale, controllability, power quality sensitivity, and increasing deployment of on-site generation and storage create new forms of interaction between demand-side infrastructures and transmission-level dynamics.

A central systems-engineering issue addressed by the session is the growing misalignment between market mechanisms and physical system requirements. While liberalized, short-term electricity markets effectively promote economic efficiency, they do not always adequately value essential system attributes such as inertia, system strength, voltage support, and fast frequency response. As a result, transmission system operators increasingly maintain security of supply under shrinking stability margins and more volatile operating conditions. This technical-economic coupling problem reflects a broader architectural tension between market-layer incentives and physical-layer constraints.

Organizers: Srđan Skok, University North, Croatia; Renata Rubeša, Croatian Transmission System Operator, Ltd., Croatia; and Dubravko Sabolić, Croatian Transmission System Operator, Ltd., and the University of Zagreb, Croatia

Chair(s): Dubravko Sabolić (Croatian Transmission System Operator); Srđan Skok (University North)

Speaker(s): Goran Levačić (Croatian Transmission System Operator); Milos Mladenovic (SEEPEx); Domagoj Peharda (Končar - Digital); Sinisa Piplica (CROPEX); Dubravko Sabolić (Croatian Transmission System Operator); Srđan Skok (University North); Nenad Uzelac (G&W Electric); Alfredo Vaccaro (University of Sannio)

E1 Veliki Amphitheater

Special Session: Funding Opportunities in Europe: European Research Council (ERC)

Thu Sep 24, 8:30 – 10:00 · Učionica E2

Chair(s): Marina Dabic (University of Dubrovnik)

Speaker(s): Endika Bengoetxea (ERCEA)

Učionica E2

Systems Architecture, Context & Trusted CPS

Thu Sep 24, 8:30 – 10:00 · Učionica B3

Chair(s): Vitus Lüntzel (Karlsruhe Institute of Technology)

An Invariant-Based Approach to Coherent Systems Architecture

8:30 – 8:50

Učionica B3

Paper ID 1571273445

Speaker(s): Therese Honda (University of Massachusetts Lowell)

Consistency-Enabled Context Inclusion in CPS Engineering

8:50 – 9:10

Učionica B3

Paper ID 1571285048

Author(s): Maximilian Beck (KIT); Muhammad Minhas (Karlsruhe Institute of Technology); Eric Sax (Karlsruhe Institute of Technology)

Speaker(s): Vitus Lüntzel (Karlsruhe Institute of Technology)

IDDMBSE: Integrating Data-Driven and Model-Based Systems Engineering for Trusted Autonomous Cyber-Physical Systems

9:10 – 9:30

Učionica B3

Paper ID 1571303536

Author(s): Sai Sandeep Damera (University of Maryland); Ryan Matheu (University of Maryland); Clinton Enwerem (University of Maryland); Praveen Kumar Menaka Sekar (University of Maryland, College Park)

Speaker(s): John Baras (University of Maryland)

Coffee Break

Thu Sep 24, 10:00 – 10:30 · Corridor Outside E1 Veliki

Digital Services & Emerging Technology Research

Thu Sep 24, 10:30 – 12:00 · Učionica B4

Chair(s): Ivan Jajic (FEB Zagreb)

Intellectual Structure of Virtual Reality Research in the Hotel Industry: A Bibliometric and Thematic Analysis

10:30 – 10:50

Učionica B4

Paper ID 1571276453

Author(s): Božidar Jaković (FEB Zagreb); Ivan Jajic (FEB Zagreb)

Speaker(s): Tamara Čurlin (FEB Zagreb)

Mapping 3D Modeling Research in Service Industries: A Bibliometric and Keyword Cluster Analysis

10:50 – 11:10

Učionica B4

Paper ID 1571276456

Author(s): Tamara Čurlin (FEB Zagreb); Božidar Jaković (FEB Zagreb)

Speaker(s): Ivan Jajic (FEB Zagreb)