Future of Systems Engineering (FuSE) highlights

34th Annual **INCOSE**
international symposium

hybrid event

Dublin, Ireland
July 2 - 6, 2024

FuSE Program Highlights

In January 2022, INCOSE published the Systems Engineering Vision 2035: Engineering Solutions for a Better World   https://www.incose.org/about-systems-engineering/se-vision-2035.   The   Vision   recognizes   the exponentially increasing scale, interconnectedness, and non-determinism of 21st Century systems. The Future of Systems Engineering (FuSE) is the engineering and systems communities' initiative to realize the Vision in a holistic and comprehensive transdisciplinary manner https://www.incose.org/about-systems-engineering/fuse.   The   FuSE   initiative   addresses   both   the   enablers   and   impediments,   considering   the political, economic, social, technical, environmental, and legal (PESTEL) factors. The challenges span applications, practices, tools and environment, research, and competencies. The path forward addresses the set of challenges while inspiring systems community collaboration and managing the culture change required to shift mindsets and approaches from the current state to the future state in the engineering of systems. FuSE is framing the realization of the Vision and measures to assess progress to proactively engage stakeholders. The four FuSE streams to realize the Systems Engineering Vision 2035 are 1) Vision & Roadmaps, 2) Fundamentals, 3) Methodologies, and 4) Application Extensions.

Presentations that will be broadcast have been marked in the list below. Broadcast presentations are recorded and available from the app during the event and for four weeks post event. After the platform closes, watch any presentations missed or rewatch them all from the INCOSE Content Library.

In person (IST)

Tuesday, July 2

10:00-10:40   *(Foundations/Socio-Technical)* **The Human-Technology Spectrum: A Framework for Evaluating Sociotechnical System Function Allocation, Risk, and Performance**
Graeme Troxell

11:30-12:10
Broadcasted   *(Methodologies/Architecture & Security)* **Enabling FuSE Security Objectives through Cyber Survivability Methods**
Barry Papke

11:30-12:10   *(Foundations/Verification)* **Theoretical Underpinnings to Establish Fidelity Conditions for Defining Verification Models**
Paul Wach

13:30-14:10
Broadcasted   *(Methodologies/Security)* **Secure Design: A Practical Approach for Systems Engineers**
Mark Winstead

13:30-14:10   *(Foundations/Validation)* **Validation Framework of a Digital Twin: A System Identification Approach**
C. Robert Kenley

14:15-14:55
Broadcasted   *(Foundations/Networks)* **Building a Scientific Foundation for Security: Multilayer Network Model Insights for System Security Engineering**
Susan Caskey

14:15-14:55   *(Methodologies/Complexity & Risks)* **Concept Design Failure Modes and Effects Analysis Using System Level Assessment**
David Genter

FuSE Program Highlights

Wednesday, July 3

10:00-10:40 *(Foundations/Principles & Heuristics)* **Case Studies for Complexity Pattern Identification**
Andrew Pickard

14:15-14:55 *(Foundations/Complexity)* **Enterprise:
Exploration of Concepts, Perspectives and Implications for Systems Engineering**
Charles Keating

15:30-16:10 *(Foundations/Transdisciplinary)* **Advancing Transdisciplinarity from Concept to Practice**
Javier Calvo-Amodio, James Martin

16:15-16:55 *(Fundamentals & Applications Extensions/Principles & Socio-Technical)*
Innovation Ecosystem Dynamics, Value and Learning I: What Can Hamilton Tell Us?
William Schindel

Thursday, July 4

10:45-11:25 *(Methodologies/Traceability)* **Traceability – A vision for now and tomorrow**
Adriana D'Souza

10:45-11:25 *(Foundations/Metamodels)***: One Model to Rule them All …
and Through Emergence, Bind Them**
Jawahar Bhalla

11:30-12:10 *(Foundations/Complexity)* **Systems Engineering Innovation through 'Futures' Methods**
Bonnie Johnson

13:30-14:10 *(Foundations/Principles)* **Synergizing Structure and Agility: A Comprehensive Analysis
of SAFe Agile Framework through the Lens of Stafford Beer's Viable System Model**
Juan Martin Cadena

14:15-14:55 *(Application Extensions/Smart Cities)* **Human-centered Smart Cities:
an evaluation of a small community using the Smart Cities Initiative framework**
Jennifer Russell

Friday, July 5

10:30-11:10 *(Foundations/Uncertainty)***: Modeling of Uncertainty in System and Enterprise Models**
Daniel Brookshier, James Martin

11:15-11:55 *(Foundations/Complexity & Emergence)* **Dealing with Emergence in Systems
Engineering Models--Fewer Surprising Failures and more "Happy Little Accidents"**
Steve Holt

13:00-13:40 *(Foundations/Complexity & PESTEL)* **An Agent-Based Ontology to Support Modeling
of Socio-Technical Systems-of-Systems**
Jakob Axelsson

13:00-13:40 *(Application Extensions/Influence)*
Broadcasted
Human Frailties: Springboard to Increased Systems Engineering Influence
Dorothy McKinney

**For more information contact Future of Systems Engineering Program Management Office at
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Program subject to change - please check the symposium website (www.incose.org/symp2024) for any updates.