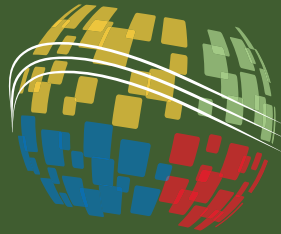# Artificial Intelligence highlights

34th Annual **INCOSE**
international symposium

hybrid event

Dublin, Ireland
July 2 - 6, 2024

Artificial Intelligence Program Highlights

Artificial Intelligence (AI) and Machine Learning (ML) is revolutionizing the way we design and interact with systems in the world today. Whether it's Generative AI for ChatGPT with underlying Large Language Models or Small Language Models, AI generated custom Art or Graphical Designs, or novel ways to interact with PCs via CoPilot, all include some form of AI/ML. AI and ML are beginning to impact our daily lives and are already intersecting with Systems Engineering. Come see what the Systems Engineering thought leaders and researchers have to say about how these technologies impact the systems we engineer and how we engineer them.

INCOSE IS 2024 features a robust AI program with SE4AI and AI4SE. The AI track on Thursday will be broadcast as will a few other presentations making them available to in-person and virtual delegates alike. 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

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

Thursday, July 4

08:00-09:30
`Broadcasted`   **Plenary Keynote speaker Mark Kelly of AI Ireland will be addressing issues relevant to AI**

   Mark Kelly
   AI Ireland
   Global AI Transformation Leader, President of AI Ireland

10:00-10:40
`Broadcasted`   **Survey of LLM Applications for Systems Engineering**
Barclay Brown

10:45-11:25
`Broadcasted`   **The Updated SERC AI and Autonomy Roadmap 2023**
Tom McDermott

11:30-12:10
`Broadcasted`   **AI Systems Modeling Enhancer (AI-SME): Initial Investigations into a ChatGPT-enabled MBSE Modeling Assistant**
Brian Johns

11:30-12:10   **Model-Based Systems Engineering (MBSE) Methodology for Integrating Autonomy into a System of Systems Using the Unified Architecture Framework**
Ali Raz

13:30-14:10
`Broadcasted`   **Optimizing Systems Engineering Workflows through Novel Applications of Large Language Models**
Edward Serzo

14:15-14:55
`Broadcasted`   **AI-Enhanced Autonomous Formation Flying - Definition of a Mission-driven and Safety-critical Software Development Environment**
Bernard Dion

15:30-16:10
`Broadcasted`   **Integrating IV&V into a generative AI Enterprise work culture**
Jason Blevins

16:15-16:55
`Broadcasted`   **Integrating AI with MBSE for Data Extraction from Medical Standards**
Mohammad Chami

Program subject to change - please check the symposium website (www.incose.org/symp2024) for any updates.

Friday, July 5

09:00-09:40 **A Case Study of AI Usage within the INCOSE Technical Process**
Kenneth Harkenrider

13:45-14:25: **Trade Space Wonders: Expanding Horizons with Graph Embeddings to understand large trade space from generative methods**
Mike Nicolai

Saturday, July 6

08:00-12:00 **Tutorial: Hands-on Journey on Variant Modelling with SysML: Features Models, Methods, SysML v2, and AI Insights**
Marco Forlingieri

08:00-17:00 **Tutorial: Systems Engineering for a Sustainable Future: Leveraging Emerging Technologies and Systems Modernization**
Randall Anway

Virtual (IST)

Thursday, July 4

10:45-11:25 **Systems and Software Engineering Cost Modeling of AI Assistance**
Raymond Madachy

Posters

Tuesday, July 2

LLM-based Approach to Automatically Establish Traceability between Requirements and MBSE
Maria Bonner, Marc Zeller, Gabor Schulz and Ana Savu

Requirement Discovery Using Embedded Knowledge Graph with ChatGPT
Braxton Vangundy, Nipa Phojanamongkolkij, Barclay Brown, Ramana Polavarapu and Joshua Bonner

Thursday, July 4

Do Algorithms Dream of Electric Requirements? Leveraging AI-Based Approaches for Automated Allocation and Classification of Requirements in Railway Engineering
David Martin and Jaume Sanso

Leveraging Large Language Models for Direct Interaction with SysML v2
John DeHart

Friday, July 5

Impact Analysis of using Natural Language Processing and Large Language Model on Automated Correction of Systems Engineering Requirements
Arthur Hendricks Mendes de Oliveira, Pedro Almeida Reis, Mairon Sena Cavalcante, Fernando Sarracini Júnior, Jonathan Vinicius de Lima, Luis Fernando Soares and Lucas Henrique Marchiori

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