

**System of Systems Engineering
Collaborators Information Exchange (SoSECIE)**

**August 27th, 2019
11:00 a.m. to Noon Eastern Time**

Understanding and Shaping the Future of System of Systems Engineering

Presenter: Mr. Garry Roedler, INCOSE

Abstract

The expectations, characteristics, properties, and technical capabilities of our systems continue to evolve. Systems today are highly interconnected, interdependent, and complex. It is hard to find a relevant system that is a stand-alone system, not interconnected to other systems or interacting in some significant way with other systems. And we expect the future environment to be much more dynamic with the System of Interest (SoI) playing different roles in different System of Systems (SoS's) at different times with different durations and levels of participation. So, do all system solutions need to be viewed as System of System (SoS) solutions? Additionally, the increases in the functionality of our systems, as well as the level of technology adoption, has continued to outpace our practices to fully harness the technology and technically manage the Systems and SoS's to our greatest advantage. The uptake of Artificial Intelligence (AI) and Autonomy (and other technologies) will change the dynamics and relationships with other systems in the SoS through self-learning and self-adaptation. To manage future systems across their life cycles, we will need to evolve the systems designs, our engineering practices, and our workforce. System of Systems Engineering (SoSE) and Digital Engineering (DE) are elements of engineering that promise to provide fundamental capability that can enable decision makers to make well-informed decisions that consider numerous factors under various conditions and facilitate agility in the systems engineering practices throughout the life cycle. SoSE can help to account for the consideration required to make the system solution adaptable and able to interact with other systems under varied conditions. Digital Engineering can provide an integrated, digital, model-based engineering approach to drive a paradigm shift in the conceptualization, development, production, utilization, and support of systems to aid in addressing complexity, uncertainty and ongoing change in our systems.

This presentation will look at our current situation and how our environment has changed, providing an understanding of the challenges we are facing with some examples using specific technology areas. It will then look at how the Future of SE / SoSE and the use of DE as an enabler has been characterized in the International Council on Systems Engineering (INCOSE) Systems Engineering Vision 2025. Finally, the presentation will provide a look at some of the work in progress to advance our processes, practices, and performance of SE and SoSE towards addressing those challenges.

Biography



Garry Roedler is a Senior Fellow and the Engineering Outreach Program Manager for Lockheed Martin, the President of the International Council on Systems Engineering (INCOSE), and Vice-chair for the NDIA Systems Engineering Division. He has over 34 years of systems engineering (SE) experience that spans the full life cycle and includes technical leadership roles in both programs and business functions. He is also an INCOSE Fellow, holds systems engineering certification at the Expert Systems Engineering Professional (ESEP) level, and received the INCOSE Founders Award. Garry has held key leadership roles in several industry associations and standards development organizations, including editor of

ISO/IEC/IEEE 15288, Systems Life Cycle Processes and several other standards; and key editor roles for the Systems Engineering Body of Knowledge (SEBoK) and the INCOSE Systems Engineering Handbook. This unique set of roles has enabled Garry to influence the technical co-evolution and consistency of these key Systems Engineering and System of Systems resources.