# Call for Papers

## *IEEE Open Journal of Systems Engineering*
## Special Issue on *Artificial Intelligence and Systems Engineering*

Artificial intelligence (AI) is enabling both the creation of new kinds of systems and new means of engineering systems. This synergy between systems engineering (SE) and AI can be expected to redefine how systems will be designed and operated in the future. While AI is being deployed in systems today, few principled frameworks exists to guide its use in engineering design and operation. Conventional approaches in the machine learning (ML) literature view learning in isolation without characterization of a systems context. Further, conventional ML approaches view learning as a problem-solving procedure, not as a component system or sub-system. Thus, the primary concerns of systems engineers (e.g., specification, testing, measurement, life cycle) have not been directly addressed in the AI/ML literature.

However, in recent years, AI has shown promise in addressing the long-standing challenges in the engineering design and operation of systems. These include management of large model spaces, model curation, multi-objective optimization, and representing and performing computations on large trade spaces. When coupled with digitalization and digital engineering, it is potentially possible that AI could become the primary means for performing top-down design and supporting system operation. The key challenges to AI's use in SE are in support of model-driven engineering, reasoning with formal models and ontologies as they relate to scalable reasoning procedures (e.g., neuro-symbolic methods), and introducing requisite flexibility in system architectures to assure scalability and extensibility.

### Key Topic Areas

This special issue seeks original papers that address the challenges in realizing SE4AI and AI4SE. Topics under consideration include: life-cycle ready AI; hybrid human/AI systems; cognitive bias in AI systems; systems approaches to AI architecting; systems theory and AI; multi-modal AI; security in AI; adversarial machine learning; trustworthy AI; AI resilience; AI risk analysis; test & evaluation of learning-based systems; automated model-building and simulation; anticipatory design; automation of digital twins; AI-enabled evidence building; AI/SE Workforce Development; and model curation.

For information on paper submission, prospective authors should visit http://ieee-aess.org/OJSE. Manuscripts should be submitted using the manuscript submission web site for IEEE Open Journal of Systems Engineering at https://ieee.atyponrex.com/journal/ojse for peer review. Publication costs are $975 (USD) for a 10-page manuscript.

### Important Dates

- Manuscript submission deadline: 1 September 2022
- First review completed: 1 November 2022
- Revised manuscript due: 1 December 2022
- Second review completed: 15 January 2023
- Final manuscript due: 15 February 2023

### Guest Editors

*Peter Beling[1,2,6], Tyler Cody[1], Azad Madni[3,4,6], Dinesh Verma[5,6]*
*[1]Virginia Tech National Security Institute, [2]Grado Department of Industrial and Systems Engineering, Virginia Tech, [3]Systems Architecting and Engineering Program, University of Southern California, [4]Department of Astronautics and Aerospace and Mechanical Engineering, University of Southern California, [5]School of Systems and Enterprises, Stevens Institute of Technology, [6]Systems Engineering Research Center (SERC)*
*{beling,tcody}@vt.edu, azad.madni@usc.edu, dinesh.verma@stevens.edu*