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A Perspective on Decision-Making Research in System of Systems Context

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Abstract

A system of systems (SoS) is a special kind of system that appears more and more in many application domains. It has spawned active research across technical domains and perspectives. One aspect of this research that has perhaps received less attention is the role of decision-making models to capture the essential collaborative nature of SoS. In this presentation, we summarize a subset of the approaches presented on this topic in an effort to subsequently identify critical areas that remain in need of further work to improve the effectiveness of the models. We identify and briefly describe key areas and discuss concept applications in these areas. A link between models used in the design/planning stages and operations/control stage is found to be an especially useful endeavor and we recommend it to the research community.

Author Biography

Navindran Davendralingam is a Research Scientist at Purdue's School of Aeronautics & Astronautics. He works as part of the Center for Integrated Systems in Aerospace (CISA) led by Dr. Daniel DeLaurentis and received his Ph.D. in Aerospace Engineering from the Purdue University in 2011. He currently works on projects that are funded by the DoD Systems Engineering Research Center UARC and the Naval Postgraduate School. His main research includes using robust optimization methods in dealing with uncertainties in systems and system of systems engineering problems. He is a member of the American Institute of Aeronautics and Astronautics (AIAA), the International Council on Systems Engineering, and the Institute for Operations Research and Management Sciences (INFORMS).