# System of Systems Engineering Collaborators Information Exchange (SoSECIE)

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**Application of Probabilistic Graph Models to Kill Chain and Multi-Domain Kill Web Analysis Problems**

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#### Abstract

As the Department of Defense (DoD) explores Model-Based Systems Engineering (MBSE) as a way to improve systems engineering practice, there are still significant gaps connecting MBSE to many pressing needs in DoD Acquisition. This work describes both the initial application of a Bayesian model-based approach to a more traditional view of kill chain analysis, and its ongoing evolution toward a more dynamic assessment of high-level effectiveness of a multi-domain web where order of battle plays an important role. The computational graph approaches used in this work directly enable integration across assessments as well as flexible, query-able analyses.

#### Biographies

Mr. Jason Baker is a Research Engineer in the Systems Engineering Research Division at the Georgia Tech Research Institute. Mr. Baker has a Master’s Degree in Aerospace Engineering from Georgia Tech. His current research focuses on the application of Bayesian network models to represent warfighting assessments to support decision making, as well as on the application of Designs of Experiments to mission level simulation and analysis.

Dr. Valerie Sitterle is a Principal Research Engineer and Chief Scientist of the in the Systems Engineering Research Division at the Georgia Tech Research Institute. She is an expert in engineering science, integrating engineering, natural, and physical sciences leading to the design and analysis of systems. She specializes in analysis of systems and their concepts of employment in theater environments.