

Agent-Based Modeling for Systems of Systems

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Abstract. Agent-based modeling is an important tool for the engineering of systems of systems. This paper briefly reviews the historical development of agent-based modeling and system of systems concepts, compares agent-based modeling to other approaches, and describes the Purdue Discrete Agent Framework for agent-based modeling. An application of the Discrete Agent Framework to a system of systems is described and illustrates the ability of agent-based modeling to capture non-intuitive behaviors that may arise due to the complex dynamics that occur in interconnected systems of agents that follow a behavioral set of rules. The paper concludes by looking back to the past to understand the potential for applying agent-based modeling to support the ongoing engineering and operations of an evolving system of systems.