

## **Clarifying Interoperability: The SISO CSPI PDG Standard for Commercial Off-The-Shelf Simulation Package Interoperability Reference Models**

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Commercial-off-the-shelf Simulation Packages (CSPs), visual interactive modelling environments such as Arena, Anylogic, Flexsim, Simul8, Witness, etc., are important "black box" software tools that support the development, experimentation and visualization of simulation models. They are widely used in commerce, defence, health, manufacturing and logistics. There is a growing need to link together, or to interoperate, models developed in these CSPs across computer networks. The motivation for this includes data sensitivity, difficult to move resources and speed up.

There have been various attempts to create distributed simulations with these CSPs and their tools, some with the High Level Architecture (HLA). In this context, a distributed simulation or federation is composed of a set of CSPs and their models. A CSP will typically simulate its model using a discrete-event simulation algorithm. Each model/CSP represents a federate normally running on its own computer. In a distributed simulation, each model/CSP federate therefore exchanges data via a runtime infrastructure (RTI) implemented over a network in a time synchronized manner. The question is what data is exchanged and how is it done. The answer to these questions can be quite difficult and it is further compounded by no "standard" terminology between the CSPs. What is clear is that there is no common approach. Additionally, it is extremely difficult to identify the actual functionality of these implementations. As a step towards creating a common approach to interoperability between models and their CSPs, the COTS Simulation Package Interoperability Product Development Group (CSPI PDG) at the Simulation Interoperability Standards Organization (SISO) has developed a standard set of Interoperability Reference Models (IRMs), the SISO CSPI

PDG Standard for Commercial Off-The-Shelf Simulation Package Interoperability Reference Models [1, 3]. These IRMs state clearly the interoperability rules for entity transfer, shared resources, shared events and shared data structures.

This talk will outline the processes by which these IRMs have been created, how they are intended to be used, and current progress in standardizing their implementation, as well as the wider range of CSPI PDG standards activities [2].

### **References**

- [1] SISO (2007). Draft Standard for Commercial-Off-The-Shelf Simulation Package Interoperability Reference Models. Available via <http://www.sisostds.org/>.
- [2] S.J.E. Taylor, S. Strassburger, S.J. Turner, M.Y.H. Low, X. Wang, and J. Ladbroke (2006). Developing Inter-operability Standards for Distributed Simulation and COTS Simulation Packages with the CSPI PDG. In Proceedings of the 2006 Winter Simulation Conference, pp.1101-1110.
- [3] S. J. E. Taylor, N. Mustafee, S.J. Turner M.Y. H. Low, S. Strassburger, and J. Ladbroke (2007). The SISO CSPI PDG Standard for Commercial Off-The-Shelf Simulation Package Interoperability Reference Models. In Proceedings of the 2007 Winter Simulation Conference, pp.594-602.