

**1999 Fall SIW Preliminary Agenda**

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	<b>Sunday</b>	<b>Monday</b>	<b>Tuesday</b>	<b>Wednesday</b>	<b>Thursday</b>	<b>Friday</b>
<b>AM</b>		<b>NewComer's Orientation</b>  <b>Joint Advanced Distributed Simulation (JADS) Joint Test and Evaluation (JT&amp;E) Program</b>  <b>Federation Development, Testing, and Analysis Tools</b>	<b>User Community Forums</b>	<b>Specialty Area Forums</b>	<b>Specialty Area Forums</b>	<b>Outbrief</b>
<b>PM</b>	<b>Adapting Your Simulation To Use HLA</b>  <b>HLA Federation Development and Execution Process (FEDEP) and Supporting Tools</b>  <b>Creating Simulations in HLA/RTI using the DEVS Modeling Framework SPEEDES - Synchronous Parallel Environment for Emulation and Discrete-Event Simulation</b>	<b>Plenary</b>				
<b>EVE</b>		<b>Sedris Update</b>  <b>Virtual Forums: SBA, SITC, NON-HLA Applications</b>	<b>International Program Reports</b>	<b>Simulation Interoperability Standards Committee Study Group</b>		

				<b>Sessions Technical Exhibits and Demonstrations</b>		
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## Virtual Forums

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The Simulation Interoperability Workshops are organized around "Tracks" of Forums, scheduled so that people with interests in a logical cluster of topics face a minimum number of times when they want to attend two or more simultaneous events. In addition, we add "Special Sessions" for topics of interest across many communities. When one of these topics seems to merit continuing discussion over several Workshops, we try to find a logical home for it within the existing Forum structure. However, some topics inherently span multiple communities of interest, and it's hard to find a single home for them.

A solution we're trying out is establishing "Virtual Forums". This involves dividing the topic of interest among two or more Forums that can provide continuity from Workshop to Workshop. We will list the relevant sessions within these Forums and designate them as a Virtual Forum, so that people interested in the topic can easily find when and where the sessions are being held. We will try to avoid time conflicts between these sessions. A Virtual Forum may also involve an evening session in which everyone interested in that topic can gather for a panel discussion and/or one or two "overview" papers.

Three Virtual Forums are being conducted at this Workshop:

### **Simulation Based Acquisition (SBA)**

This Virtual Track focuses on ongoing SBA developments, issues, lessons learned, economic benefits, and emerging markets. Sessions will focus on

- Overview and status of the SBA Roadmap.
- SBA Architecture - Organizing and implementing simulation systems to support acquisition decisions across phases and programs including reuse and interoperability.
- Virtual prototyping - Testing and Evaluation of technology, product and system performance in distributed simulations.
- Existing and proposed collaborative environments in acquisition.
- Distributed Product Description (DPD) development and Smart Product Models.
- Interfaces and standards that facilitate sharing models and data between government and industry.
- Emerging standards and interoperability challenges.
- Cultural, organizational, and environmental SBA issues

### **Simulation Interoperability Through Components (SITC)**

This Virtual Track addresses the use of component technology to support simulation interoperability. The goal of this effort is to illuminate the use of components over the whole simulation life cycle, from the federation requirements, through federation design, to implementation. Sessions will address

- Component frameworks for supporting simulation interoperability, including extensions to current frameworks and simulation interoperability standards to support component technology.
- Components for simulation design, including Base Object Models (BOMs), and

- characterization of design components (including metadata).
- Components for simulation implementations.
  - Management issues associated with simulation component use, including simulation component repositories, VV&A and testing issues, and tool support.

### **NON-HLA Applications Session**

SIW recognizes that many distributed simulations use different types of interoperability protocols. Some of these include the Distributed Interactive Simulation (DIS) protocols of IEEE Standard 1278, Common Object Request Broker Architecture (CORBA), Web-based simulations, entertainment oriented protocols, future interoperability protocols, etc. This session is intended to help those using these Non-HLA protocols to share experiences and/or their applications. There will also be a presentation by the Standards Activities Committee regarding plans for Life Cycle Maintenance of IEEE 1278.

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## **SUNDAY --- Afternoon**

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### **Tutorial Sessions**

SISO's "day before" tutorial program (held on Sunday, 12 September, 1:00 - 5:00 PM EDT) consists of four parallel sessions. A \$50 fee will be assessed for those registering for a tutorial to cover the costs of materials, equipment, facilities, and refreshments. The tutorial sessions include:

#### ● **Adapting Your Simulation To Use HLA**

*(Jeff Steinman and Lois Yu, Metron)*

This tutorial will aid in planning the adaptation of legacy simulations to use HLA, and will be presented in three modules. The first module is designed to help analysts plan for HLA implementation. It provides guidance on how to design your first SOM and then describes how to identify which RTI services your simulation requires. The second module focuses on software implementation issues that arise when adapting a simulation to use HLA. Interoperability topics discussed include: time management, two-way interfaces, modularity, automating exception handling, and data representation. The third module is a case study which demonstrates how the Naval Simulation System applied the ideas presented in the earlier modules. The overall approach presented here can be used to adapt other simulations for HLA use as well.

#### ● **HLA Federation Development and Execution Process (FEDEP) and Supporting Tools**

This tutorial consists of two two-hour blocks:

Part A. Federation Development and Execution Process (Bob Lutz, JHU APL, Chris Turrell, A/B Technologies, and Marnie Salisbury, Mitre)

Part B. Tools to Help Plan, Test and Configure Your Federation for Performance (Richard Briggs, VTC)

This tutorial is intended for those who wish to understand how to assess the performance requirements of a federation, measure the performance capabilities of system resources, and configure a federation for improved execution performance. The focus of this tutorial is on the practical activities that should be performed during the design, development, and integration phases of the FEDEP and includes discussions of the DMSO-sponsored tools and resources that support those activities. These activities/resources include Federation Object Model (FOM) development, Federation Execution Planner's Workbook (FEPW) development, RTI performance benchmark execution, RTI RID configuration, and Federation Verification Tool (FVT) application.

#### ● **Creating Simulations in HLA/RTI using the DEVS Modeling Framework**

*(Bernard Zeigler and Hessam Sarjoughian, Univ. Arizona)*

The Discrete Event System Specification (DEVS) is a formal framework for modeling and simulation. The DEVS framework has a number of important modeling features, including support for

- Full range of dynamic system representation capability
- Hierarchical, modular model development
- Stand-alone and stage-wise testing
- Model family representation and reuse

In this tutorial the basic concepts of DEVS are explained, followed by a presentation of how the DEVS framework assists developers in creating distributed simulations. Particular emphasis is placed on simulations adhering to the HLA specifications. In addition, because DEVS has been implemented in a user-friendly, HLA-compliant (C++/Java) distributed environment called DEVS/HLA, the tutorial will also address how the DEVS concepts complement those of the HLA/RTI, so that they can be viewed as a supporting middleware simulation layer.

### ● **SPEEDES - Synchronous Parallel Environment for Emulation and Discrete-Event Simulation**

*(Jeff Steinman, Metron)*

SPEEDES is a government-owned, NASA-patented, optimistic simulation framework that is currently supporting several large DoD simulation projects including the Joint Simulation System (core infrastructure for the enterprise), Wargame 2000 (modeling framework), and the High-Performance Computing Modernization Office (HLA on high-performance computers). A government body, called the Parallel Discrete Event Simulation (PDES) User's Group, has recently been formed to help standardize the framework and share development costs. This tutorial covers the fundamentals of SPEEDES at a conceptual level. Topics include

- Optimistic time management, with an emphasis on the flow-control mechanisms that ensure run-time stability in an interactive environment.
- The internal design of SPEEDES
- The SPEEDES Modeling Framework
- SPEEDES and the High-Level Architecture.

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## **MONDAY --- Morning**

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### **Special Sessions**

#### ● **Newcomer's Orientation**

The Newcomer's Orientation is designed for those who have not previously attended a SISO Simulation Interoperability Workshop. The session's goal is to help the new attendee gain maximum benefit from the Workshop and from participation in SISO. In this session, we describe the structure of the Workshop, the overall organization of the Simulation Interoperability Standards Organization, how it works and how to participate in it, and an overview of the DoD High Level Architecture. This session includes much of the "Introduction to the DoD High Level Architecture (HLA) for Modeling and Simulation" material presented as a Sunday afternoon tutorial at previous Workshops. If this is your first Workshop, this is where you should be on Monday morning.

#### ● **Joint Advanced Distributed Simulation (JADS) Joint Test and Evaluation (JT&E)**

## **Program**

This special session will present the findings and lessons learned from the OSD sponsored Joint Advanced Distributed Simulation (JADS) Joint Test, which was chartered in 1994 to determine the utility of advanced distributed simulation (ADS) for developmental and operational test and evaluation (T&E). The session will be divided into three panels which will provide different perspectives of the JADS experience: (1) overall findings on utility of ADS to T&E, (2) being a distributed simulation "provider" to a distributed T&E event and (3) selected technical aspects of using ADS for T&E. Approximately 1/3 of each panel's time will be allocated for questions and answers.

### **● Federation Development, Testing, and Analysis Tools**

This session is designed for any person or organization with an interest in tools to support the development of HLA federations. The purpose of the session is to inform the HLA user community of the wide variety of both government and commercial software tools that have been developed (or are being developed) to facilitate federation development activities. In this session, we begin with an overview of the HLA Federation Development and Execution Process (FEDEP) Model and the HLA Tool Architecture, explicitly identifying the classes of tools that support FEDEP activities. Then, representatives of various government and commercial organizations will provide an overview of the tools they have developed, including hosting information, key features, developmental status, and points of contact. Finally, the session will conclude with a discussion of DMSO efforts to ensure the availability of tools for HLA applications.

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## **MONDAY --- Afternoon**

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### **Plenary Session**

#### **● Tenth Anniversary Celebration**

The Monday afternoon Plenary Session will begin with a celebration of the tenth anniversary of the "First Conference on Standards for the Interoperability of Defense Simulations" in August of 1989, a direct ancestor of SISO. Several familiar faces from the past will be present. Some historical videotape excerpts will be shown. (See how many people you recognize -- perhaps even yourself!) If you are new to SISO, learn something of our historical background.

Plenary speakers will include:

#### **● Dr. Anita K. Jones, former Director, Defense Research and Engineering**

Professor Jones is a University Professor in the University of Virginia and a Professor of Computer Science in the School of Engineering and Applied Science. She returned to the University in the Spring of 1997 after serving for four years as the Director of Defense Research and Engineering. In that position she was responsible for the management of the science and technology program of the Department of Defense. This included responsibility for the Defense Advanced Research Projects Agency, oversight of the DoD laboratories, as well as being the principal advisor to the Secretary of Defense for defense-related scientific and technical matters. She was responsible for both DoD-wide strategy and plans to develop technologies that enable U.S. military advantage. In particular, she oversaw the development of the High Level Architecture for Modeling and Simulation and encouraged the formation of SISO.

#### **● Christopher Stapleton, Producer, Universal Creative**

Christopher Stapleton is from Universal Creative, where he has just completed the creation of Toon Lagoon at Universal Studios Islands of Adventure theme park. He has spent the last 20 years as a creative principal developing experiences and environments for entertainment, marketing, and education. His positions have included producer, creative director, design director, and production designer. His work includes projects for film, television, theater, theme parks, museums, and interactive computer graphics. He has created projects for Universal

Studios, Walt Disney World, Nickelodeon Studios, Paramount Parks, MTV Networks, Dollywood, and Sanrio. He has been an industrial partner with the Institute for Simulation and Training and is presently consulting with the University of Central Florida's Consortium for Research and Education in the Arts and Technology (CREAT) program.

● **Brig. Gen. Swen G. Persson, Commander, Swedish Defense Wargaming Centre**

Brig. Gen. Persson (Swedish Air Force) is Commander of the Swedish Defense Wargaming Centre. He is also a member of the Royal Swedish Academy of War Sciences and a member of the International Institute of Strategic Studies. He is currently serving as Program Manager for the US - Swedish Partnership for Peace (PfP) Simulation Network. Recently, he served as CJ3 and Deputy Chief of Staff of the Southern Joint Military Command Staff. Previously, he served as Commanding Officer of the 16th Fighter Wing, Swedish Air Force. He has been an International Fellow at the National Defense University, Washington D.C., Head of Strategy and Joint Operations Division at Sweden's National Defence College, and Vice President of Sweden's National Defence College.

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## **MONDAY --- Evening**

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### **Special Sessions**

● **SEDRIS Update**

The Synthetic Environment Data Representation and Interchange Specification (SEDRIS) is a mechanism for representing the natural environment data found in a variety of simulation and non-simulation applications. SEDRIS allows for the representation of the ocean, the ocean bottom, and ocean features (both natural and man-made); terrain and terrain features (both natural and man-made); 3-D models of vehicles, personnel, and other objects; the atmosphere, including environmental phenomena; and near space. One of the SEDRIS objectives is to provide a mechanism for the unambiguous interchange of environmental data for every type of simulation application. This session will focus on an overview of key SEDRIS technologies and their use in various domains and applications. Representatives from the SEDRIS team will report on the project activities and progress, and will highlight several stand-alone components of SEDRIS technology which are being proposed as SISO standards. Additional SEDRIS-related papers will be presented in other SIW forums, including the Environment Track Forums.

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## **TUESDAY --- Morning and Afternoon**

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### **User Community Forums**

User Community Forums focus on topics that span specialty areas and are of broad interest to users within a particular area of M&S application. User Community Forums include:

● **Analysis Forum (ANL)**, which focuses on the use of distributed models and simulations for analysis applications.

● **Research, Development, and Engineering Forum (RDE)**, which is concerned with the evaluation of alternative designs and research concepts as well as supporting specific engineering decisions within the RDE community.

● **Test and Evaluation Forum (TE)**, which focuses on comparing the performance of a system or its components with the physical, technical, and operational performance requirements to reduce risk in acquisition and employment of the system.

- **Small Team Training Forum (STT)**, which focuses on the planning, management, requirements, and use of simulations to provide individual, sub-team, and team training to system operators, team leaders, tactical decision makers, and other hands-on users.

- **Staff-Level Training Forum (SLT)**, which focuses on command and staff training (wargaming, "battle staff" training, strategic/theater planning, etc.), and on supporting representation of decision-making methodologies.

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## **TUESDAY --- Evening**

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### **International Program Reports**

Following an informal reception hosted by members of the international SISO community, the International Session provides everyone the opportunity to hear and learn about goals, achievements, and issues arising from programs and projects outside the U.S. Presentations for this session are selected to provide the widest possible cross section of activities, with special emphasis on programs involving two or more nations.

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## **WEDNESDAY and THURSDAY**

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### **SPECIALTY AREA FORUM**

Specialty Area Forums bring together specialists from different communities to discuss issues of simulation interoperability and component reuse. The Specialty Area Forums are organized into five Tracks.

- **INFRASTRUCTURE TRACK**

**The Run-Time Infrastructure and Communications Forum (RTI)** focuses on issues related to the HLA Runtime Infrastructure (RTI), including RTI services, RTI performance characterization, and RTI "middleware."

**The Live Interaction Forum (LIVE)** addresses issues concerned with the interaction of live entities in interoperable simulations

- **ENVIRONMENT TRACK**

**The Simulated Natural Environment Forum (SNE)** is concerned with the common representation of the land, ocean, atmosphere, surf zone and space environment in interoperable simulations.

**The Sensor Forum (SENS)**, which is co-administered by the C4ISR Track, serves as a bridge between environmental and mission/system-related areas, focusing on issues of interoperability, fidelity, and correlation for sensor simulations.

- **FEDERATION DEVELOPMENT TRACK**

**The Federation Development Process Forum (PROC)** focuses on the Federation development and execution life-cycle process.

**The Exercise Management Forum (EMF)** discusses tools for automating the Federation Development in areas such as exercise planning, initialization, monitoring, data collection, analysis, and after-action review.

**The Verification, Validation & Accreditation Forum (VV&A)** deals with issues of credibility and appropriate use related to federation development and application.

**The Testing Forum (TEST)** addresses techniques, tools, drivers, and methodologies for testing as they apply to HLA, SISO Standards, the transition of legacy simulations to SISO standards, and the development of new federates and federations.

#### ● C4ISR TRACK

**The Command, Control, Communications, Computers, and Intelligence (C4I) Forum** is concerned with the interoperability of simulations which represent command and control, communications, intelligence collection, processing and dissemination and information warfare.

**The Sensor Forum (SENS)**, which is co-administered by the Environment Track, focuses on the use of sensors for navigation, search and target acquisition, reconnaissance, surveillance, intelligence, emissions tracking, IR search and tracking, fire control and missile systems (detection, warning, and design) and guidance.

#### ● APPLICATIONS TRACK

**The Federation Implementers' Forum (IMPL)** addresses the resources, processes, and issues encountered in developing Federates and Federations. IMPL's focus is on implementation level details (i.e., how does it work, how is it used, how can it be improved).

**The Vehicle/Weapon System Modeling Forum (VWS)** focuses on the development and reuse of vehicle/weapon system simulations, including manned and unmanned weapons which operate in space, air, ground, and sea environments.

**The Human Decision-Making and Behavior Representation Forum (BEH)** is concerned with the representation of human behaviors in models and simulations. Issues range from providing appropriate interfaces to live humans acting as entities in a simulation to automating human decision-making processes at all levels.

**The Logistics Forum (LOG)** focuses on issues related to all aspects of logistics, including representations at the national, strategic, operational, and tactical military levels, as well as non-military and commercial logistics.

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### WEDNESDAY --- Evening

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#### **Simulation Interoperability Standards Committee**

On Wednesday evening, the second official meeting of the Simulation Interoperability Standards Committee will take place. The SISC is officially a committee under the IEEE Computer Society. A formal announcement of this meeting and the agenda to be followed will be posted shortly. During the meeting,

the current IEEE standard efforts will be discussed, as well as other SISC-related business.

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### **Study Group Sessions**

On Tuesday evening, the Fidelity Experimentation Implementation Study Group (FEX-ISG) will hold a special session discussing experiences in applying the fidelity framework published in 99S-SIW-167 to current simulation challenges, and suggestions for extending or revising this framework. Individuals with an interest in developing practical, objective, and quantifiable fidelity assessment techniques are encouraged to participate.

On Wednesday evening, the Implementation Study Group for C4I-to-Simulation Interfaces (ISG-C4I) will discuss issues of interfacing real C4ISR equipment to simulations, including relationships between the High Level Architecture and the Joint Technical Architecture, as well as NATO aspects of interoperability that may ultimately bear on the development of SISO standards. A key task for the ISG-C4I is the study and consideration of a proposed C4ISR Interface Technical Reference Model as a potential SISO standard, and the use of common databases to facilitate interoperability between real systems and simulations.

On Thursday evening, the RTI Interoperability Study Group will present its final report and invite discussion and questions. Their report addresses the feasibility of RTI-to-RTI interoperability, a key issue in the development of cost effective, reusable simulations.

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### **Technical Exhibits and Demonstrations**

Throughout the week, several organizations will provide exhibits and demonstrations of materials, software, and equipment relevant to distributed simulation applications. The exhibit/demonstration area will be open during the lunch breaks each day and from late afternoon to early evening.

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### **FRIDAY --- Morning**

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#### **Outbrief Session**

The Friday morning Outbrief Session is presented by the Chairs of each Forum, summarizing the key points raised and insights reached in each Forum. Each Forum also makes specific recommendations for future SISO Workshops and Standards activities. This session provides an excellent overview of the current state of the art and major issues in simulation interoperability. We strongly encourage all participants to attend this final session.

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#### **Site and Accommodations**

The Workshop will be held at the Holiday Inn, International Drive, Orlando, FL. **NOTE:** all hotel reservations will be handled through IEEE Travel and Conference Management Services rather than directly with the hotel. The special conference rate is \$94/night (tax included). A government rate is also available for a limited number of rooms. Proof of status will be required to obtain the government rate. Make your reservations by contacting ITCMS at 1-800-810-4333 (in the U.S. or Canada), +732-562-6826 (outside the U.S. or Canada), by faxing your request to 732-981-1203, or by emailing it to [SISO@ieee.org](mailto:SISO@ieee.org). Please note that the early registration deadline is August 9th.

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#### **DoD Participation**

The Office of the Secretary of Defense has reviewed the plans for this Workshop and issued the following determination: "The Department of Defense finds this event meets the minimum regulatory standards for attendance by DoD employees. This finding does not constitute a blanket approval or endorsement for attendance. Individual DoD Component commands or organizations are responsible for approving attendance of its DoD employees based on mission requirements and DoD regulations."

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**Conference Committee**

Duncan Miller (Chair), *MIT Lincoln Lab*

Sam Knight (Vice Chair), *Raytheon*

Susan Solick (Secretary), *TRADOC Analysis Center*

Ron Hofer, *Univ. Central Florida IST*

Joe Lacetera, *MSTI*

Dan Schiavone, *Ball Aerospace*

Rick Severinghaus, *Booz Allen and Hamilton*

Graham Shanks, *Alenia Marconi Systems*

John Shockley, *SRI International*

Bill Tucker, *Boeing*

Michael Myjak (SAC Vice Chair), *The Virtual Workshop*