



# SCSC2004 Tutorials

SCSC2004 San Jose`



## SCSC2004 Tutorial List

SCSC Tutorial ID	Title	Preliminary Schedule
SCSC_T1	<b>Developing Facility Geometry for a Missile Hardware-in-the-Loop Simulation Using the Synthetic Line-of-Sight Method</b> <i>Helmut Snyder, Raytheon Company USA</i>	<i>Sunday July 25, 2004 9:30 am – 12:30 pm</i>
SCSC_T2	<b>Overview of Discrete Event Models: Petri Nets, DEVS, GDEVS</b> <i>Norbert Giambiasi, LSIS, France</i>	<i>Sunday July 25, 2004 2:00 pm – 5:30 pm</i>
SCSC_T3	<b>Simulation for Time Series Analysis and Forecasts</b> <i>Simone Simeoni, Liophant Simulation</i>	<i>Sunday July 25, 2004 9:30 am – 12:30 pm</i>
SCSC_T4	<b>Critical Issues in Simulation</b> <i>Vince Amico (UCF, NCS) and Matteo Brandolini (BRB Studio)</i>	<i>Sunday July 25, 2004 2:00 pm – 5:30 pm</i>
SCSC_T5	<b>Design of Experiments for Simulation Projects</b> <i>C.Briano (Liophant Simulation) &amp; E.Williams (PMCorp)</i>	<i>Sunday July 25, 2004 2:00 pm – 5:30 pm</i>

*The general descriptions of SCSC2004 Tutorials are summarized in the following part of this document; if you are interested in receiving further information please contact Dr.Massei ([marina.massei@liophant.org](mailto:marina.massei@liophant.org)) or Prof.Bruzzzone ([agostino@itim.unige.it](mailto:agostino@itim.unige.it))*

*If you are interested in attending SCSC2004 Tutorials please be sure in the registration form included in the **Author Kit** ([www.liophant.org/scsc2004](http://www.liophant.org/scsc2004)) to include the **SCSC Tutorial ID**; please note that the the tutorial fee is 150 USD.*



## SCSC2004 Tutorials

SCSC2004 San Jose`  
Sunday July 25, 2004  
9:30 am – 12:30 pm



Tutorial ID: SCSC\_T1

### Developing Facility Geometry for a Missile Hardware-in-the-Loop Simulation Using the Synthetic Line-of-Sight Method

*Helmut Snyder, Raytheon Company USA*

This tutorial is the third in the series that describes "What is a Missile Hardware-in-the-Loop Simulation". Part-1 was a conceptual presentation describing what is meant by a hardware-in-the-loop simulation and specifically focused on the Raytheon Patriot facility in Bedford Ma (presented in ASTC2002). The second part described some of the standard nomenclature and math techniques that are used (presented in ASTC2003), and the third and final part describes how we replicate real-world geometry in a facility using an anechoic chamber, a RF target generator, a flight table and the synthetic line-of-sight method.

The SLOS method has the following advantages over the simulation method that employs a fixed non rotating reference frame.

- (1) The SLOS method extends the geometry that can be simulated for a given 3-axis flight table and target generator.
- (2) The SLOS method eliminates the need to physically or electronically move the target in the facility for a single-target engagement. This can greatly reduce the cost or make simulations possible where the target generator could not be moved under any circumstances. For multiple target engagements, however, spatial target motion (electronic or physical) must be generated.
- (3) The SLOS method can be used without a flight table with some restrictions, which may or may not affect the validity of the simulation.
- (4) The complete implementation also includes:
  - (a) compensatory terms for the non-concentric mounting for the seeker of the missile-under-test in a flight table
  - (b) redefining the center of the target generator in the facility for special applications or to extend the dynamic range of the simulated intercept geometry, and
  - (c) the ability to model a continuously rolling missile, at slow rates for a single-target engagement, without requiring a continuous-roll flight table.

*Helmut Snyder* is a principal engineer and simulation expert who has been instrumental in all of Raytheon's missile hardware-in-the-loop facilities prior to the Hughes acquisition. These included the AMRAAM, Sparrow, Maverick, Standard Missile, Hawk and Patriot facilities. He received both his BSEE & MSEE from the University of Massachusetts at Lowell and has taught simulation courses as an adjunct professor to Fitchburg State College.

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## SCSC2004 Tutorials

SCSC2004 San Jose`  
Sunday July 25, 2004  
2:00 pm – 5:00 pm



**Tutorial ID: SCSC\_T2**

### **Overview of Discrete Event Models: Petri Nets, DEVS, GDEVS**

**Norbert Giambiasi, LSIS, France**

This tutorial is devoted to give an overview of characteristics of Discrete-event models and to present different modeling paradigms.

The tutorial discusses the possibilities for using these paradigms for modeling and simulation in different sectors of application.

The tutorial includes an overview about different techniques and formalism such as Petri Nets, Automata, Event Graphs, DEVS (Discrete-Event Specifications), Queuing Models, etc.

The tutorial provides also fundamentals about new advances and generalizations (i.e. G-DEVS Generalized DEVS).

**Norbert Giambiasi** (*Norbert.giambiasi@lsis.org*) is full professor in Aix-Marseille III University as well as Director of LSIS (Laboratory of Science and Information Systems). He is active from many years in simulation and currently his research is focusing especially on researches on DEVS and relative developments. He is responsible for France of an Trans Atlantic Master Program in Modeling and Simulation applied to Logistics sponsored by European Community and USA.



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# SCSC2004 Tutorials

SCSC2004 San Jose`  
Sunday July 25, 2004  
9:30 am – 12:30 pm



**Tutorial ID: SCSC\_T3**

## Simulation for Time Series Analysis and Forecasts

**Simone Simeoni, Liophant Simulation**

This Tutorial focuses on providing an overview about benefits of using the Simulation for Time Series Analysis and forecasts.

The tutorial includes an overview about the methodologies to model these phenomena and for analyzing data; the tutorial includes applicative introduction to both Time Series Analysis, Moving Average and Exponential Smoothing, ARMA and ARIMA; the tutorial proceeds in presenting simulation as support for estimating effectiveness of different techniques in forecasting considering stochastic nature of processes to be investigated, cluster analysis and constraints influence.

Indeed the tutorial discusses fundamentals about the common use forecast models and time series analysis in different applications: demand analysis, logistics, planning, etc.

The tutorial includes examples and exercises for demonstrating the techniques; some background in engineering or statistics could be useful, however all the fundamental elements will be transferred during the course.

**Simone Simeoni** completed the Management Engineering degree in Genoa University working on PUMA project in cooperation with Ansaldo Energia.

He participated to the several international symposiums (i.e. ASTC2001 Seattle, ESS2000, HMS2000, AICE2000) and in 2000 he won the 1st Award as Best Project in ICAMES. He had visiting experiences in CAE Montreal (working with Rose in Modeling & Simulation of Power Plants), Lockheed Martin Canada for cooperating in Data Fusion Projects, Ford Motor Company in Detroit (where he worked on Logistics projects applied to Production Plants using Witness, Automod and Simul8).

He participated actively into SIREN Courses in M&S and HLA.

Currently he is involved in supervision and Project Management of project related to implementing an ERP (SAP R/3 Retail (tm) ) with a major Italian company; he is active in logistics modeling for Retail.

He is currently involved as Project Manager representative in over 100 IT projects in a billion dollar company operating as member of DIP special research team.



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# SCSC2004 Tutorials

SCSC2004 San Jose`  
Sunday July 25, 2004  
2:00 pm – 5:30 pm



**Tutorial ID: SCSC\_T4**

## Critical Issues in Simulation

**Vince Amico (UCF, NCS) and Matteo Brandolini (BRB Studio)**

This Tutorial focuses on providing an overview about the critical issues in Simulation; the presentation identifies the different aspects in simulation project providing clues for improving their effectiveness.

The simulation project management is outlined and includes examples from industrial and military applications and general criteria as well as performance indexes.

The presentation benefits from a large experience obtained over years by the experts and from case study extracted world-wide from real simulation projects.

Some background in simulation, engineering or project management could be useful, however all the fundamental elements are included in the tutorial package.

**Vince Amico** started his career in simulation when he joined the Special Devices Center in 1948 as a Project Engineer in the Flight Trainers Branch.

He was promoted to Branch head, Division head, and then to Chief Engineer of the Special Projects Office. In 1969 he was selected for the position of Director of Engineering at the Senior Executive level. Then he was assigned to the position of Director of Research in 1979. He retired in 1981.

Since then he did consulting, taught short courses of simulation and presented papers at SCS and I/TSEC Conferences. He was a member of the Board of SCS and also served as VP Conferences. He is a member of AFCEA, AIAA, NDIA, and SCS. He holds BofAE, MBA and MSE degrees. He is the Industrial Affiliates Coordinator for the School of Computer Science at UCF. He is a member of the Board of Directors of the National Center for Simulation.

**Matteo Brandolini** obtained the Full Degree in Management Engineering. In May 1996 he won the ICAMES '96 best project award, held in Istanbul; in the following years he attended several international conferences as speaker and participated in Scientific and NATO workshops related to Innovative Technologies. He taught professional courses in Europe and North America on Modelling & Simulation, VV&A, HLA and Design of Experiments for major world companies and institutions (i.e. Honeywell, LMC, Alenia, Genoa University, TU Delft). He is specialized in consulting related to BPR, Environmental Management, Simulation & Training, Retail Reorganization, ERP projects, E-Commerce and Project Management with major Italian Companies. He is a founder member of the Liophant where he is serving as Treasurer and he is author of several scientific papers; currently he serves as a member of the IPC in several international conferences (Track Chair of Business Applications in SCSC San Jose`, Conference Coordinator in HMS2004 and MAS2004). Currently he is partner in BRB Studio and in 3B Studio consulting firms.



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# SCSC2004 Tutorials

SCSC2004 San Jose`  
Sunday July 25, 2004  
2:00 pm – 5:30 pm



**Tutorial ID: SCSC\_T5**

## Design of Experiments for Simulation Projects

**Chiara Briano (Liophant Simulation) & Edward Williams (PMCorp, USA)**

This tutorial is devoted to using DOE (Design of Experiments) in Simulation projects for completing experimental analysis of results; the course include ANOVA analysis applied to Stochastic Discrete Event Simulation as well as Factorial and Composite Designed for Sensitivity Analysis and Meta-modeling. Critical Issues on DOE applied to simulation are highlighted and a detailed overview of techniques and real examples is provided to the attendees. The different approaches provided by the experts of DOE are proposed as well as considerations to be used with Industrial Simulators (i.e. Discrete Variables, Optimization Critical Issues and Performance Limits). The attendees are expected to have some basic background in statistics.

**Chiara Briano** obtained the University Degree in Logistic and Production Engineering in Genoa University and completed her studies obtaining doctorship in Management Engineering, both "summa cum laude". She is active in Computer Simulation from many years and she has realized several simulators for industrial applications (i.e Ship Yard Construction, Target Tracking and Classification, Environmental Emergencies Management, Logistics and Industrial Management). Currently she is working in consulting M&S applied to ERP Integration, Customer Satisfaction, Company Reorganization and BPR. She is senior partner in two engineering consulting firms. She is founder member and Director of Liophant Simulation.

**Edward J. Williams** holds bachelor's and master's degrees in mathematics (Michigan State University, 1967; University of Wisconsin, 1968). From 1969 to 1971, he did statistical programming and analysis of biomedical data at Walter Reed Army Hospital, Washington, D.C. He joined Ford Motor Company in 1972, where he worked until retirement in December 2001 as a computer software analyst supporting statistical and simulation software. After retirement from Ford, he joined Production Modeling Corporation, Dearborn, Michigan, as a senior simulation analyst. Also, since 1980, he has taught evening classes at the University of Michigan, including both undergraduate and graduate simulation classes using GPSS/H, SLAM II, SIMAN, ProModel, SIMUL8, or Arena. He is a member of the Institute of Industrial Engineers [IIE], the Society for Computer Simulation International [SCS], and the Michigan Simulation Users' Group [MSUG]. He serves on the editorial board of the International Journal of Industrial Engineering - Applications and Practice. During the last several years, he has given invited plenary addresses on simulation and statistics at conferences in Monterrey, México; Istanbul, Turkey; Genova, Italy; and Riga, Latvia.



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