SCSC Tutorials

2003 Summer Simulation Multiconference

Sponsored By The Society For
Modeling and Simulation International

SCS

July 20–24, 2003 • Montreal, Quebec, Canada

Sunday July 20, 2003

Tutorial 12 - Room 1	SCSC2003	Montreal

Simulation for Logistics

10:00 am – 12:00 am
Robert Signorile
Computer Science Department, Boston College
USA

BOSTON COLLEGE

This tutorial focuses on providing an overview about benefits provided by Simulation within Logistics; the tutorial provides some fundamentals about these applications in relation to techniques and methodologies to be used; the tutorial includes also a wide set of applications examples in real cases.
Critical issues in this application area and directions to modelers are provided, at the same time all the analysis techniques and ROI measures are presented.

Robert Signorile *(signoril@bc.edu)*, BC is professor in Computer Science of Boston College and he is active from many years in simulation applied to Logistics.
He is currently in charge as USA coordinator of IEPAL project for an Intensive Educational Program in Advanced Logistics sponsored by FIPSE and involving three major Educational Nord America Institutions and a large Consortium of Companies and Agencies.

SCSC2003 Tutorials

Sunday July 20, 2003

Tutorial 10 - Room 1	SCSC2003	Montreal

Overview of Discrete Event Models: Petri Nets, DEVS, G-DEVS etc.

1:30 pm – 3:30 pm
Norbert Giambiasi
LSIS, Marseille
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.

SCSC2003 Tutorials

Sunday July 20, 2003

Tutorial 11 - Room 1 **SCSC2003** **Montreal**

Computer Automated Multi-Paradigm Modeling (CAMPaM)

4:00 pm – 6:00 pm

Hans Vangeleuwe
MCGills University
Canada

Over the last decades, engineered systems have reached a tremendous level of complexity, involving expertise from many disciplines and entailing a variety of implementation technologies. To address this complexity, CAMPaM integrates three orthogonal directions:

(i) multi-formalism modeling, concerned with the coupling of and transformation between models described in different formalisms,
(ii) model abstraction, concerned with the relationship between models at different levels of abstraction, and
(iii) meta-modeling, concerned with the description (models of models) of classes of models and as such allows formalism specification.

This tutorial will introduce these three aspects of CAMPaM through simple examples.
Firstly, sample simulation formalisms (UML Statecharts, Petri Nets, Hybrid Automata combining Ordinary Differential Equations with Event Scheduling, and DEVS) will be introduced. The relative merits of these will be presented and it will be shown how these formalisms can be easily meta-modelled and how visual modelling environments can be synthesized. Secondly, model transformation will be shown to be at the core of model abstraction, simplification, coupling of models in different formalisms, as well as of simulator specification. It will be demonstrated how graph rewriting can be used to execute models of transformation.
All demonstrations will use AToM3, a prototype CAMPaM tool. Links with the OMG's Model Driven Architecture for software design will be made.
This presentation is based on joint work with Pieter Mosterman (The MathWorks) and Juan de Lara (Autonomous University of Madrid).

***Hans Vangheluwe** (hv@cs.mcgill.ca)* is an Assistant Professor in the School of Computer Science at McGill University, Montréal, Canada. He holds degrees in Computer Science, Theoretical Physics and Education from Ghent University in Belgium.
He teaches Modelling and Simulation, as well as Software Design.
He also heads the Modelling and Simulation and Design (MSDL) research lab.
He has been the Principal Investigator of a number of research projects focused on the development of a multi-formalism theory for Modelling and Simulation. Some of this work has led to the WEST++ tool, which was commercialized for use in the design and optimization of Waste Water Treatment Plants. He was the co-founder and coordinator of the European Union's ESPRIT Basic Research Working Group 8467 ``Simulation in Europe", and a founding member of the Modelica Design Team.

SCSC2003 Tutorials

Sunday July 20, 2003

Tutorial 9 - Room 2	SCSC2003	Montreal

Design of Experiments for Simulation Projects

10:00 am – 12:00 pm

Roberto Mosca
DIP University of Genoa
Italy

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 background in statistics.

Roberto Mosca (*roberto@itim.unige.it*)is Full Professor at the DIP (Department of Industrial Production & Engineerings), University of Genoa. He has worked in the simulation sector since 1969 using discrete and stochastic industrial simulators for off-line and on-line applications. His research work focuses on the evaluation of simulation languages and new modeling techniques and his research team is developing new AI applications for industrial plant management. Currently he is involved as coordinator in the coordination of Savona campus, focused on industrial engineering and he is the Director of DIP University of Genoa.

SCSC2003 Tutorials

Sunday July 20, 2003

Tutorial 8- Room 2	SCSC2003	Montreal

VV&T Procedures in Industrial M&S Applications

1:30 pm - 3:30 pm

Agostino Bruzzone
Liophant Simulation Club

This tutorial is organized for scientists and technicians interested in VV&T (Verification, Validation and Testing) activity applied to industrial simulation projects.
The tutorial includes lecturing and exercises to be completed in reference to industrial case studies for highlighting critical issues and effective techniques.
The tutorial is focusing on methodologies and techniques to be used effectively in Industrial project for measuring simulation confidence and guaranteeing fidelity.
The VV&T tutorial is oriented to VV&A responsible, Subject Matter Experts, M&S project participants, M&S team members and researchers. The attendees are expected to have some background in M&S and in computer use.

Agostino Bruzzone is professor in Genoa University and Director of the McLeod Institute of Simulation Science; he is developer of innovative researches in M&S applied to Industrial Engineering, Logistics and Decision Support; he had served as SCS Associate VP, MIMOS Vice President, ISAG Italian POC, Liophant President as well as General Chair for many conferences such as WebSim1999 San Francisco, Summer Computer Simulation Conference, HMS, MAS.

SCSC2003 Tutorials

Sunday July 20, 2003

Tutorial 7- Room 2	SCSC2003	Montreal

NAVI: Learning HLA from an Interactive Exercize

4:00 pm - 6:00 pm
Roberto Revetria
DIP University of Genoa
Italy

NAVI is an interactive exercise devoted to train people in development, installation, configuration and execution of HLA (High Level Architecture) Federations. NAVI provides the opportunity to experiment the problems and requirements for developing and using HLA simulators.
NAVI has been successfully used in the last years for SIREN Program (Simulation Technology Transfer Initiative) transferring HLA know-how to Industry, Agencies and Universities in Europe.
The NAVI exercise is based on an naval scenario using Java/C++ Programming Language;
The NAVI tutorial is oriented to programmers, developers, simulation experts, HLA project engineers and researchers.
The attendees are expected to have some background in M&S and in Fundamentals of Computer Science.

Roberto Revetria (*revetria@itim.unige.it*) earned his degree in engineering at Genoa University of Genoa and he completed his PhD in Parma on AI and Simulation applied to Industrial Engineering. During his service in the Navy as officer, he was involved in the development of WSS&S (Weapon System Simulation & Service) Project for developing a Web Based Simulator. He had experiences in modeling applied to environmental management and production planning in cooperation with major companies (i.e. AMT, Bosch, Marconi).Recently he was active in the development of WILD (Web Integrated Logistics Designer) initiative devoted to apply HLA in Industrial Simulation for Supply Chain Management.

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TUTORIAL REGISTRATION FORM **SCSC2003 Montreal, July 20-24**

(available on www.scs.org)

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Tutorial No. ___ & Title _____
1st Tutorial Registration Fee (150 USD) ____ USD

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