PROCEEDINGS OF THE 2010 SPRING SIMULATION MULTICONFERENCE 11-15 April – Orlando, FL USA

2010 Spring Simulation Multiconference Books:

Book 1 - Agent-Directed Simulation Symposium (ADS)
Book 2 - 43rd Annual Simulation Symposium (ANSS)
Book 3 - 13th Communications & Networking Symposium (CNS)
Book 4 - Symposium on Theory of Modeling & Simulation – DEVS Integrative M&S Symposium (DEVS)
Book 5 - Emerging M&S Applications in Industry & Academia Symposium (EAIA)
Book 6 - High Performance Computing Symposium (HPC)
Book 7 - Military Modeling & Simulation Symposium (MMS)
Book 8 - Symposium on Simulation for Architecture & Urban Design (SimAUD)

Book 9 - 9th International Conference on Bond Graph Modeling & Simulation (ICBGM)

Production Editors: Michael J. Chinni Diane "DJ" Weed

Printed from e-media with permission by:

Curran Associates, Inc. 57 Morehouse Lane Red Hook, NY 12571 www.proceedings.com



Some format issues inherent in the e-media version may also appear in this print version.

© 2010 SIMULATION COUNCILS, INC.

Responsibility for the accuracy of all statement in each paper rests solely with the author(s). Statements are not necessarily representative of, nor endorsed by, The Society for Modeling and Simulation International.

Printed by Curran Associates, Inc. (2010)

Permission is granted to photocopy portions of this publication for personal use and for the use of students provided credit is given to the conference and publication. Permission does not extend to other types of reproduction nor to copying for incorporation into commercial advertising nor for any other profit-making purpose. Other publications are encouraged to include 300- to 500-word abstracts or excerpts from any paper contained in this book, provided credits are given to the author and the conference. For permission to publish a complete paper write: The Society for Modeling and Simulation International (SCS), P.O. Box 17900, San Diego, CA 92177, USA.

Additional copies of the Proceedings are available from:

Curran Associates, Inc. 57 Morehouse Lane Red Hook, NY 12571 <u>curran@proceedings.com</u> www.proceedings.com/0128.html

or

The Society for Modeling and Simulation International 2598 Fortune Way, Ste I Vista, CA 92081 USA

ISBN: 978-1-61738-207-9 PRINTED IN THE UNITED STATES

Table of Contents: MMS

| Application of RT-DEVS in Military | 3 |
|---|---------|
| <u>A Cordon and Search Model and Simulation using Timed, Stochastic, Colored Petri Nets for</u> <u>Robust Decision-Making</u> | 11 |
| Defining the Entity Transfer Interoperability Reference Model for Military Applications | 19 |
| A Constraint-based Solver for the Military Unit Path Finding Problem | 27 |
| Violent Extremist Network Representation and Attack the Network Course of Action Analysis in Social Simulation | 35 |
| DEVS-based Doctrine Validation of Fleet Anti-Air Defense | 43 |
| Maintenance Planning Using Simulation-Based Optimization | 51 |
| What Information Does this Question Convey? Leveraging Help-Seeking Behavior for Improved Modeling in a Simulation-Based Intelligent Tutor | 59 |
| Special Panel Session: Simulation-Based Training for Irregular Warfare | 67 |
| Special Panel Session: Emerging Targets for Military Simulation-Based Training | 71 |
| Special Panel Session: Dual-Use Modeling and Simulation | 76 |
| Insights from Empirical Metacognitive Research | 80 |
| Automating Instructional Support for SBT: Next-generation Expeditionary Warfare Intelligent Training (NEW-IT) | 84 |
| <u>A Preliminary Investigation into the Modeling and Simulation of Engagement Decision-</u> making Processes and Encumbrance | 89 |
| Visualizing the Human, Social, Cultural and Behavioral Components of a Complex Conflict Ecosystem | 95 |
| Applying Advanced User Models and Input Technologies to Augment Military Simulation- Based Training | 103 |
| Enabling Psychological Operations in Simulation | 110 |

| Simulation of Fully Autonomous Control of Unmanned Air Vehicles for Maritime Surveillance | 119 |
|---|---------|
| Automating Instruction Support: Insights From Field Research | 128 |
| Serious Games for First Person 'Thinker' | 134 |
| Enhanced Expert Field Medical Training Simulations and their effect on the Modern Combat Life Saver Training Procedures | 139 |
| Research Advances in Automated Red Teaming | 145 |
| Developing an Instructor Support System for Scenario-Based Training | 153 |
| A human-in-the loop approach for representing populations in virtual and constructive simulations | 159 |
| Panel Title: Serious Games and Virtual Worlds: Is There A Future With Serious Role-Playing Games for Learning Using Open Metaverses? | 167 |
| A Path Forward: Advancing the Science of UxV Operations & Training | 168 |
| A Scenario Generation Framework for Automating Instructional Support in Scenario-based Training | 173 |
| Serious Games and Tactical Decision Making Training | 179 |
| Go With the Flow: Engagement Factors for Learning in Second Life | 187 |
| Blended Solutions for Counter-IED Training | 196 |
| Serious Games and Virtual Worlds – Building the Puzzle without a Picture | 204 |
| Further Exploration in Primitives of Meaning | 205 |
| The Impact of Unmanned Weapon Systems on Individual and Team Performance | 213 |
| Instructional Strategies for Scenario-based Training: Insights from Applied Research | 218 |