

PROCEEDINGS OF SPIE

***Modeling and Simulation  
for Military Operations III***

**Dawn A. Trevisani**  
*Editor*

**19 March 2008**  
**Orlando, Florida, USA**

*Sponsored and Published by*  
SPIE

**Volume 6965**

Proceedings of SPIE, 0277-786X, v. 6965

SPIE is an international society advancing an interdisciplinary approach to the science and application of light.

The papers included in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. The papers published in these proceedings reflect the work and thoughts of the authors and are published herein as submitted. The publisher is not responsible for the validity of the information or for any outcomes resulting from reliance thereon.

Please use the following format to cite material from this book:

Author(s), "Title of Paper," in *Modeling and Simulation for Military Operations III*, edited by Dawn A. Trevisani, Proceedings of SPIE Vol. 6965 (SPIE, Bellingham, WA, 2008) Article CID Number.

ISSN 0277-786X  
ISBN 9780819471567

Published by

**SPIE**

P.O. Box 10, Bellingham, Washington 98227-0010 USA  
Telephone +1 360 676 3290 (Pacific Time) · Fax +1 360 647 1445  
SPIE.org

Copyright © 2008, Society of Photo-Optical Instrumentation Engineers

Copying of material in this book for internal or personal use, or for the internal or personal use of specific clients, beyond the fair use provisions granted by the U.S. Copyright Law is authorized by SPIE subject to payment of copying fees. The Transactional Reporting Service base fee for this volume is \$18.00 per article (or portion thereof), which should be paid directly to the Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, MA 01923. Payment may also be made electronically through CCC Online at [copyright.com](http://copyright.com). Other copying for republication, resale, advertising or promotion, or any form of systematic or multiple reproduction of any material in this book is prohibited except with permission in writing from the publisher. The CCC fee code is 0277-786X/08/\$18.00.

Printed in the United States of America.

Publication of record for individual papers is online in the SPIE Digital Library.

**SPIE**   
Digital Library

[SPIDigitalLibrary.org](http://SPIDigitalLibrary.org)

---

**Paper Numbering:** Proceedings of SPIE follow an e-First publication model, with papers published first online and then in print and on CD-ROM. Papers are published as they are submitted and meet publication criteria. A unique, consistent, permanent citation identifier (CID) number is assigned to each article at the time of the first publication. Utilization of CIDs allows articles to be fully citable as soon they are published online, and connects the same identifier to all online, print, and electronic versions of the publication. SPIE uses a six-digit CID article numbering system in which:

- The first four digits correspond to the SPIE volume number.
- The last two digits indicate publication order within the volume using a Base 36 numbering system employing both numerals and letters. These two-number sets start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B ... 0Z, followed by 10-1Z, 20-2Z, etc.

The CID number appears on each page of the manuscript. The complete citation is used on the first page, and an abbreviated version on subsequent pages. Numbers in the index correspond to the last two digits of the six-digit CID number.

# Contents

v *Conference Committee*

---

## SESSION 1 BEHAVIOR MODELING

---

- 6965 02 **On deception detection in multi-agent systems and deception intent** [6965-01]  
E. Santos, Jr., D. Li, X. Yuan, Dartmouth College (USA)
- 6965 03 **Modeling adversarial intent for interactive simulation and gaming: the fused intent system**  
[6965-02]  
E. Santos, Jr., Dartmouth College (USA); B. McQueary, L. Krause, Securborator, Inc. (USA)
- 6965 04 **Behavior modeling through CHAOS for simulation of dismounted soldier operations**  
[6965-03]  
E. Ubink, F. Aldershoff, W. Lotens, A. Woering, TNO Defense, Security and Safety  
(Netherlands)
- 6965 05 **Enhancing emotional-based target prediction** [6965-04]  
M. Gosnell, R. Woodley, 21st Century Systems, Inc. (USA)
- 6965 06 **Self-organizing modeling and simulation structures** [6965-05]  
J. Brander, Interactive Engineering (Australia)

---

## SESSION 2 SENSOR MODELING

---

- 6965 07 **Using stochastic process algebra models to estimate the quality of information in military sensor networks** [6965-06]  
D. J. Thornley, Imperial College London (United Kingdom); C. Bisdikian, IBM Corp. (USA);  
D. F. Gillies, Imperial College London (United Kingdom)
- 6965 08 **A simulation program for the Firefinder radar** [6965-07]  
B. Abramov, H. W. Birrell, E. P. Lam, R. C. Schalk, Thales-Raytheon Systems (USA)
- 6965 09 **Optimised autonomous search pattern evaluation using the Cerberus framework** [6965-08]  
C. Angell, M. Bernhardt, Waterfall Solutions Ltd. (United Kingdom)
- 6965 0A **Irma 5.2 multi-sensor signature prediction model** [6965-09]  
J. Savage, C. Coker, Air Force Research Lab. (USA); B. Thai, O. Aboutalib, J. Pau, Northrop  
Grumman Corp. (USA)
- 6965 0B **Hyperspectral extensions in the MuSES signature code** [6965-10]  
W. Pereira, D. Less, L. Rodriguez, A. Curran, ThermoAnalytics, Inc. (USA); U. Bernstein,  
Y.-T. Kwan, Technology Service Corp. (USA)

---

**SESSION 3 MODELING FOR OPERATIONAL EFFECTIVENESS**

---

- 6965 0C **Methodologies for aggregating large hierarchical simulation models** [6965-11]  
J. D. Rodriguez, J. O. Miller, K. W. Bauer, Jr., R. E. Neher, Jr., Air Force Institute of Technology (USA)
- 6965 0D **Formal analytical modeling of blog content as personal narrative** [6965-12]  
M. J. Coombs, Diplomacy Media Research (USA); H. M. Jaenisch, Alabama A&M Univ. (USA) and Licht Strahl Engineering Inc. (USA); J. W. Handley, Licht Strahl Engineering Inc. (USA)
- 6965 0F **Accelerated determination of UAV flight envelopes** [6965-14]  
M. R. Bodnar, EM Photonics, Inc. (USA); L. N. Long, Pennsylvania State Univ. (USA); J. R. Humphrey, E. J. Kelmelis, EM Photonics, Inc. (USA)
- 6965 0G **Modeling, simulation, and evaluation of HE ammunition for counter-RAM systems** [6965-15]  
M. Graswald, H. Rothe, Helmut-Schmidt-Univ., Univ. of the Federal Armed Forces Hamburg (Germany)

---

**SESSION 4 FEATURE MODELING AND VISUALIZATION**

---

- 6965 0H **Three-dimensional visualization and control of electronic warfare (EW) payloads** [6965-16]  
P. Kirsch, D. Tremper, R. Cortesi, Naval Research Lab. (USA)
- 6965 0J **A Kalman-filter-based multi-sensor terrain profile measurement system: principle, implementation and validation** [6965-19]  
F. Liu, N. Dembski, A. Soliman, G. Rizzoni, Ohio State Univ. (USA); B. Thompson, B. Vaughn, Army Yuma Proving Ground (USA)
- 6965 0K **Modeling terrain for geo-pairing and casualty assessment in OneTESS** [6965-20]  
W. Baer, Naval Postgraduate School (USA); T. R. Campbell, U.S. Army Operational Test Command (USA); J. Campos, Applied Research Associates, Inc. (USA); W. Powell, U.S. Army Operational Test Command (USA)

*Author Index*

# Conference Committee

## *Symposium Chair*

**Larry B. Stotts**, Defense Advanced Research Projects Agency (USA)

## *Symposium Cochair*

**Ray O. Johnson**, Lockheed Martin Corporation (USA)

## *Program Track Chair*

**Dawn A. Trevisani**, Air Force Research Laboratory (USA)

## *Conference Chair*

**Dawn A. Trevisani**, Air Force Research Laboratory (USA)

## *Program Committee*

**Victoria R. Hahn**, Raytheon Missile Systems (USA)

**Michael D. Letherwood**, U.S. Army Tank-Automotive Research,  
Development and Engineering Center (USA)

**Judson McCarty**, Air Force Research Laboratory (USA)

**Alex F. Sisti**, Air Force Research Laboratory (USA)

## *Session Chairs*

- 1 Behavior Modeling  
**Robert Woodley**, 21st Century Systems, Inc. (USA)
- 2 Sensor Modeling  
**James C. Savage**, Air Force Research Laboratory (USA)
- 3 Modeling for Operational Effectiveness  
**Eric J. Kelmelis**, EM Photonics, Inc. (USA)
- 4 Feature Modeling and Visualization  
**Jim E. Brander**, Interactive Engineering Pty Ltd. (Australia)

