Modeling and Simulation for Defense Systems and Applications X

Eric J. Kelmelis  
Editor

21 April 2015  
Baltimore, Maryland, United States

Sponsored and Published by  
SPIE

Volume 9478
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:

ISSN: 0277-786X
ISBN: 9781628415940

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 © 2015, 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. 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/15/$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
SPIEDigitalLibrary.org

Paper Numbering: Proceedings of SPIE follow an e-First publication model, with papers published first online and then in print. Papers are published as they are submitted and meet publication criteria. A unique 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 as 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 10-12, 20-22, 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.
## Contents

<table>
<thead>
<tr>
<th>Session</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>MOBILE AND COMMUNICATIONS</strong></td>
<td></td>
</tr>
<tr>
<td>9478 02</td>
<td>Secure communication systems using synchronized Lorenz strange attractor on reconfigurable hardware</td>
<td>[9478-1]</td>
</tr>
<tr>
<td>9478 04</td>
<td>Investigating weaknesses in Android certificate security</td>
<td>[9478-4]</td>
</tr>
<tr>
<td>9478 05</td>
<td>The effectiveness of the jammer signal characteristics on conical-scan systems</td>
<td>[9478-12]</td>
</tr>
<tr>
<td></td>
<td><strong>ALGORITHMS, PLATFORMS, AND TOOLS</strong></td>
<td></td>
</tr>
<tr>
<td>9478 06</td>
<td>Adaptive OpenCL libraries for platform portability</td>
<td>[9478-5]</td>
</tr>
<tr>
<td>9478 07</td>
<td>Enhanced modeling and simulation of EO/IR sensor systems</td>
<td>[9478-6]</td>
</tr>
<tr>
<td>9478 08</td>
<td>An evaluation of algorithms and methods for compressing and decompressing atmospheric transmission data for use in at-sensor measurements</td>
<td>[9478-7]</td>
</tr>
<tr>
<td></td>
<td><strong>SYSTEMS AND ENVIRONMENTS I</strong></td>
<td></td>
</tr>
<tr>
<td>9478 0A</td>
<td>A reference model for model-based design of critical infrastructure protection systems</td>
<td>[9478-9]</td>
</tr>
<tr>
<td>9478 0C</td>
<td>Focus on connections for successful organizational transformation to model based engineering</td>
<td>[9478-11]</td>
</tr>
<tr>
<td>9478 0E</td>
<td>Target detection and tracking in maritime surveillance mission</td>
<td>[9478-14]</td>
</tr>
<tr>
<td></td>
<td><strong>SYSTEMS AND ENVIRONMENTS II</strong></td>
<td></td>
</tr>
<tr>
<td>9478 0F</td>
<td>Virtual sensor tracking using byzantine fault tolerance and predictive outlier model for complex tasks recognition</td>
<td>[9478-15]</td>
</tr>
<tr>
<td>9478 0H</td>
<td>The use of a low-cost visible light 3D scanner to create virtual reality environment models of actors and objects</td>
<td>[9478-17]</td>
</tr>
<tr>
<td>9478 0I</td>
<td>Physical environment virtualization for human activities recognition</td>
<td>[9478-18]</td>
</tr>
<tr>
<td>9478 0J</td>
<td>Dynamic fair node spectrum allocation for ad hoc networks using random matrices</td>
<td>[9478-2]</td>
</tr>
</tbody>
</table>
Building GSM network in extreme conditions [9478-19]
Authors

Numbers in the index correspond to the last two digits of the six-digit citation identifier (CID) article numbering system used in Proceedings of SPIE. The first four digits reflect the volume number. Base 36 numbering is employed for the last two digits and indicates the order of articles within the volume. Numbers start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B...0Z, followed by 10-1Z, 20-2Z, etc.

Aboutanios, Elias, 0E
Aslan, Murat Ş., 05
Babineau, Guy L., 0C
Batten, Alyssa L., 06
Bui, Vy, 02
Chan, Alex, 0I
Chester, Dave, 0J
Chmelikova, Z., 0K
Elangovan, Vinayak, 0I
El-Araby, Esam, 02
Fajkus, M., 0K
Fox, Paul A., 06
Glodek, William, 04
Hayes, Marcus, 06
Hixson, Jonathan G., 07
Hu, Shuowen, 0I
Iyer, Vasanth, 0F
Kelmelis, Eric J., 06
Krych, Daniel E., 04
Lange-Maney, Stephen, 04
Lee, Jae-Chon, 0A
Lemieux, George, 0J
May, Christopher, 07
McDaniel, Patrick, 04
Mikulec, M., 0K
Miller, Brian, 07
Namazi, Nader M., 02
Nehmatallah, Georges, 02
Park, Cheol Young, 0A
Partila, P., 0K
Poshtkar, Azin, 0I
Rahmes, Mark, 0J
Sabordo, Madeleine G., 0E
Şahingil, Mehmet C., 05
Sepantaie, Amir M., 02
Sepantaie, Marc M., 02
Shetty, Sachin, 0F
Shin, Young Don, 0A
Shirkhodaie, Amir, 0I
Sonnenberg, Jerry, 0J
Straub, Jeremy, 0H
Tovarek, J., 0K
Van Benilhem, Mark H., 08
Vaznok, M., 0K
Woodbury, Drew P., 08
Conference Committee

Symposium Chair

Nils R. Sandell Jr., Strategic Technology Office, DARPA (United States)

Symposium Co-chair

David A. Logan, BAE Systems (United States)

Conference Chair

Eric J. Kelmels, EM Photonics, Inc. (United States)

Conference Program Committee

James P. Durbano, Northrop Grumman (United States)
James N. Elele, Naval Air Systems Command (United States)
Susan Harkrider, U.S. Army Night Vision & Electronic Sensors Directorate (United States)
Jonathan D. Rogers, Georgia Institute of Technology (United States)
Robert Wright, Capella University (United States)
Chen Wu, Defence Research and Development Canada, Ottawa (Canada)

Session Chairs

1 Mobile and Communications
   James Bonnett, EM Photonics, Inc. (United States)

2 Algorithms, Platforms, and Tools
   Marc M. Sepantaie, The Catholic University of America (United States)

3 Systems and Environments I
   Jeremy Straub, University of North Dakota (United States)

4 Systems and Environments II
   James Bonnett, EM Photonics, Inc. (United States)