PROCEEDINGS OF SPIE

Detection and Sensing of Mines, Explosive Objects, and Obscured Targets XIV

Russell S. Harmon
J. Thomas Broach
John H. Holloway, Jr.
Editors

13–17 April 2009
Orlando, Florida, United States

Sponsored and Published by
SPIE

Volume 7303

Proceedings of SPIE, 0277-786X, v. 7303

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 *Detection and Sensing of Mines, Explosive Objects, and Obscured Targets XIV*, edited by Russell S. Harmon, J. Thomas Broach, John H. Holloway, Jr., Proceedings of SPIE Vol. 7303 (SPIE, Bellingham, WA, 2009) Article CID Number.

ISSN 0277-786X
ISBN 9780819475695

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

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 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

ENVIRONMENTAL EFFECTS ON SENSING TECHNOLOGIES

SIGNAL PROCESSING AND STATISTICAL CLASSIFICATION I

SIGNAL PROCESSING AND STATISTICAL CLASSIFICATION II

SIGNAL PROCESSING AND STATISTICAL CLASSIFICATION III

Conference Committee

Symposium Chair

Ray O. Johnson, Lockheed Martin Corp. (United States)

Symposium Cochair

Michael T. Eismann, Air Force Research Laboratory (United States)

Conference Chairs

Russell S. Harmon, U.S. Army Research Office (United States)
J. Thomas Broach, U.S. Army Night Vision & Electronic Sensors Directorate (United States)
John H. Holloway, Jr., Naval Surface Warfare Center, Panama City (United States)

Program Committee

Leslie M. Collins, Duke University (United States)
Yogadhish Das, Defence Research and Development Canada (Canada)
Robert M. Deas, Defence Science and Technology Laboratory (United Kingdom)
Gerald J. Dobeck, Naval Surface Warfare Center (United States)
Paul D. Gader, University of Florida (United States)
John E. McFee, Defence Research and Development Canada (Canada)
James M. Sabatier, The University of Mississippi (United States)
Motoyuki Sato IV, Tohoku University (Japan)
Miranda A. Schatten, U.S. Army Night Vision & Electronic Sensors Directorate (United States)
Waymond R. Scott, Jr., Georgia Institute of Technology (United States)
Richard C. Weaver, U.S. Army Night Vision & Electronic Sensors Directorate (United States)

Session Chairs

1 Explosives Detection and Environmental Effects I
Jan M. H. Hendrickx, New Mexico Institute of Mining and Technology (United States)
Russell S. Harmon, U.S. Army Research Office (United States)

2 Explosives Detection and Environmental Effects II
John E. McFee, Defence Research and Development Canada (Canada)
Julio Briano, Universidad de Puerto Rico, Mayagüez (United States)

3 Sensing and Detection in the Marine Environment
Gerald J. Dobeck, Naval Surface Warfare Center (United States)
John H. Holloway, Jr., Naval Surface Warfare Center, Panama City (United States)

4 Acoustic Sensing
James M. Sabatier, The University of Mississippi (United States)
Steven S. Bishop, U.S. Army Night Vision & Electronic Sensors Directorate (United States)

5 EMI Sensing I
J. Thomas Broach, U.S. Army Night Vision & Electronic Sensors Directorate (United States)

6 EMI Sensing II
J. Thomas Broach, U.S. Army Night Vision & Electronic Sensors Directorate (United States)

7 EMI Sensing III
Fridon Shubitidze, Dartmouth College (United States)
Benjamin E. Barrowes, U.S. Army Engineer Research and Development Center (United States)

8 Environmental Effects on Sensing Technologies
Jan Igel, Leibniz Institute for Applied Geosciences (Germany)
Holger Preetz, Leibniz Institute for Applied Geosciences (Germany)

9 Optical Sensing I
Horacio A. Abbate, Universidad de Buenos Aires (Argentina)
Neelam Gupta, Army Research Laboratory (United States)

10 Multi-Sensor Systems and Field Tests
Motoyuki Sato IV, Tohoku University (Japan)
Miranda A. Schatten Silvious, U.S. Army Night Vision & Electronic Sensors Directorate (United States)

11 Optical Sensing II
Patrick J. Treado, ChemImage Corporation (United States)
Peter Howard, U.S. Army Night Vision & Electronic Sensors Directorate (United States)