PROCEEDINGS OF SPIE

SPIDigitalLibrary.org/conference-proceedings-of-spie

Front Matter: Volume 8382

, "Front Matter: Volume 8382," Proc. SPIE 8382, Active and Passive Signatures III, 838201 (7 June 2012); doi: 10.1117/12.979461

Event: SPIE Defense, Security, and Sensing, 2012, Baltimore, Maryland, United States

PROCEEDINGS OF SPIE

Active and Passive Signatures III

**G. Charmaine Gilbreath
Chadwick T. Hawley**
Editors

**25–26 April 2012
Baltimore, Maryland, United States**

Sponsored and Published by
SPIE

Volume 8382

Proceedings of SPIE, 0277-786X, v. 8382

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

Active and Passive Signatures III, edited by G. Charmaine Gilbreath, Chadwick T. Hawley
Proc. of SPIE Vol. 8382, 838201 · © 2012 SPIE · CCC code: 0277-786X/12/\$18 · doi: 10.1117/12.979461

Proc. of SPIE Vol. 8382 838201-1

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 *Active and Passive Signatures III*, edited by G. Charmaine Gilbreath, Chadwick T. Hawley, Proceedings of SPIE Vol. 8382 (SPIE, Bellingham, WA, 2012) Article CID Number.

ISSN 0277-786X

ISBN 9780819490605

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 © 2012, 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/12/\$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

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 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 10-1Z, 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

vii *Conference Committee*

SESSION 1 ACTIVE AND PASSIVE SIGNATURES III

- 8382 02 **Disaster relief through composite signatures (Invited Paper)** [8382-01]
C. T. Hawley, Signatures Support Program (United States); B. Hyde, T. Carpenter, ASR, Inc. (United States); S. Nichols, Technigraphics Inc. (United States)
- 8382 03 **The U.S. Army Research Laboratory (ARL) multimodal signature database (MMSDB) advanced data storage solutions and security of data over the web** [8382-02]
K. Bennett, U.S. Army Research Lab. (United States); J. Robertson, Clearhaven Technologies LLC (United States)
- 8382 04 **An interactive 2-D power-line modeling and simulation tool** [8382-03]
D. Hull, R. Adelman, U.S. Army Research Lab. (United States)

SESSION 2 MATERIALS DETECTION SIGNATURES

- 8382 06 **Enhancing nuclear quadrupole resonance (NQR) signature detection leveraging interference suppression algorithms** [8382-06]
J. A. DeBardelaben, J. K. Miller, W. Myrick, IvySys Technologies, LLC (United States); J. B. Miller, G. C. Gilbreath, B. Bajramaj, U.S. Naval Research Lab. (United States)
- 8382 07 **Entangled-photons Raman spectroscopy** [8382-30]
M. Lanzagorta, U.S. Naval Research Lab. (United States)
- 8382 09 **Neutron detection based on capture-gamma sensing and calorimetry** [8382-08]
G. Pausch, C.-M. Herbach, FLIR Radiation GmbH (United States); D. Mitchell, Sandia National Labs. (United States); R. Lentering, J. Stein, FLIR Radiation GmbH (United States)
- 8382 0A **Photofission signatures for the detection of highly enriched uranium (Invited Paper)** [8382-09]
S. A. Pozzi, S. D. Clarke, Univ. of Michigan (United States)
- 8382 0B **Detection and identification of compound explosive using the SDA method of the reflected THz signal (Invited Paper)** [8382-10]
V. A. Trofimov, S. A. Varentsova, Lomonosov Moscow State Univ. (Russian Federation); M. Szustakowski, N. Palka, Military Univ. of Technology (Poland)
- 8382 0C **Resonance structure of water complexes of β -HMX for THz frequencies** [8382-11]
L. Huang, U.S. Naval Research Lab. (United States); A. Shabaev, George Mason Univ. (United States); S. G. Lambrakos, N. Bernstein, V. Jacobs, U.S. Naval Research Lab. (United States); L. Massa, Hunter College, CUNY (United States)

SESSION 3 HUMAN SIGNATURES

- 8382 0D **Data dependency on measurement uncertainties in speaker recognition evaluation** [8382-12]
J. C. Wu, A. F. Martin, C. S. Greenberg, R. N. Kacker, National Institute of Standards and Technology (United States)
- 8382 0E **Speckle signatures of articulating humans** [8382-13]
D. G. Conrad III, Univ. of Dayton (United States); E. A. Watson, Air Force Research Lab. (United States)
- 8382 0F **The use of spectral skin reflectivity and laser doppler vibrometry data to determine the optimal site and wavelength to collect human vital sign signatures** [8382-14]
K. A. Byrd, B. Kaur, V. A. Hodgkin, U.S. Army Night Vision & Electronic Sensors Directorate (United States)

SESSION 4 SPECTRAL SIGNATURES

- 8382 0J **Study of hyperspectral characteristics of different types of flares and smoke candles** [8382-19]
V. Farley, M. Chamberland, P. Lagueux, Telops Inc. (Canada); M. Kastek, T. Piatkowski, R. Dulski, Military Univ. of Technology (Poland)
- 8382 0K **Multispectral and hyperspectral measurements of soldier's camouflage equipment** [8382-20]
M. Kastek, T. Piatkowski, R. Dulski, Military Univ. of Technology (Poland); M. Chamberland, P. Lagueux, V. Farley, Telops Inc. (Canada)
- 8382 0L **Blind separation of human- and horse-footstep signatures using independent component analysis** [8382-21]
A. Mehmood, T. Damarla, U.S. Army Research Lab. (United States)
- 8382 0M **Analysis of electrostatic charge on small-arms projectiles** [8382-22]
S. Vinci, J. Zhu, D. Hull, U.S. Army Research Lab. (United States)

SESSION 5 MATHEMATICAL METHODS

- 8382 0O **Tripod operators for efficient search of point cloud data for known surface shapes (Invited Paper)** [8382-24]
F. Pipitone, C. Gilbreath, D. Bonanno, U.S. Naval Research Lab. (United States)
- 8382 0P **Acoustic change detection algorithm using an FM radio** [8382-25]
G. H. Goldman, O. Wolfe, U.S. Army Research Lab. (United States)

SESSION 6 ATMOSPHERIC AND TROPOSPHERIC SIGNATURES

- 8382 0Q **Characterization of the atmosphere as a random bit-stream generator** [8382-26]
C. Font, D. Bonanno, H. Long, B. Bajramaj, G. C. Gilbreath, U.S. Naval Research Lab. (United States)

- 8382 OR **Coherent uplink arraying techniques for next generation orbital debris, near earth object, and space situational awareness radar systems (Invited Paper)** [8382-27]
B. J. Geldzahler, NASA Headquarters (United States)

Author Index

Conference Committee

Symposium Chair

Kevin P. Meiners, Office of the Secretary of Defense (United States)

Symposium Cochair

Kenneth R. Israel, Lockheed Martin Corporation (United States)

Conference Chairs

G. Charmaine Gilbreath, U.S. Naval Research Laboratory (United States)

Chadwick T. Hawley, National Signature Program (United States)

Program Committee

Kelly W. Bennett, U.S. Army Research Laboratory (United States)

Carlos O. Font, U.S. Naval Research Laboratory (United States)

Herbert J. Mitchell, U. S. Naval Postgraduate School (United States)

Joseph E. Peak, U.S. Naval Research Laboratory (United States)

Frank Pipitone, U.S. Naval Research Laboratory (United States)

Carl Salvaggio, Rochester Institute of Technology (United States)

Noriko Satake, University of California Davis Medical Center (United States)

Session Chairs

- 1 Active and Passive Signatures III
Charmaine Gilbreath, U.S. Naval Research Laboratory (United States)
- 2 Materials Detection Signatures
Kelly W. Bennett, U.S. Army Research Laboratory (United States)
- 3 Human Signatures
Carlos O. Font, U.S. Naval Research Laboratory (United States)
- 4 Spectral Signatures
Chadwick T. Hawley, National Signature Program (United States)
- 5 Mathematical Methods
Autumn Williams-Bess, Applied Systems Research, Inc., CACI (United States)

- 6 Atmospheric and Tropospheric Signatures
 Frank Pipitone, U.S. Naval Research Laboratory (United States)