

PROCEEDINGS OF SPIE

Counterterrorism, Crime Fighting, Forensics, and Surveillance Technologies VI

**Henri Bouma
Radhakrishna Prabhu
Robert J. Stokes
Yitzhak Yitzhaky**
Editors

**5–6 September 2022
Berlin, Germany**

Sponsored by
SPIE

Cooperating Organisations
Cranfield University (United Kingdom)
OpTecBB (Germany)
International Society for Photogrammetry and Remote Sensing
European Association of Remote Sensing Companies

Published by
SPIE

Volume 12275

Proceedings of SPIE 0277-786X, V. 12275

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

The papers 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. Additional papers and presentation recordings may be available online in the SPIE Digital Library at SPIDigitalLibrary.org.

The papers 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 these proceedings:

Author(s), "Title of Paper," in *Counterterrorism, Crime Fighting, Forensics, and Surveillance Technologies VI*, edited by Henri Bouma, Radhakrishna Prabhu, Robert J. Stokes, Yitzhak Yitzhaky, Proc. of SPIE 12275, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510655539

ISBN: 9781510655546 (electronic)

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA

Telephone +1 360 676 3290 (Pacific Time)

SPIE.org

Copyright © 2022 Society of Photo-Optical Instrumentation Engineers (SPIE).

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 fees. To obtain permission to use and share articles in this volume, visit Copyright Clearance Center 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.

Printed in the United States of America by Curran Associates, Inc., under license from SPIE.

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

**SPIE. DIGITAL
LIBRARY**

SPIDigitalLibrary.org

Paper Numbering: A unique citation identifier (CID) number is assigned to each article in the Proceedings of SPIE at the time of 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 and print versions of the publication. SPIE uses a seven-digit CID article numbering system structured as follows:

- The first five 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.

Contents

vi *Conference Committee*

SESSION 1 CBRNE + SPECTROSCOPY

- 12275 02 **Use of dopants for detection of vapors of explosives by laser field asymmetric ion mobility spectrometer** [12275-1]
- 12275 03 **Stationary two-unit detector of explosives with a light detector module based on traditional ion mobility spectrometry** [12275-2]
- 12275 04 **Photostability of luminophores sensitive to vapors of nitroaromatic compounds in a porous silicon microcavity** [12275-3]

SESSION 2 CONCEALED, REMOTE SENSING, AND COMMUNICATION

- 12275 06 **MMW imaging system based on GDD focal plane array with improved technology for detection of concealed objects** [12275-5]
- 12275 07 **Detection and recognition of concealed faces using a 340 GHz imaging system** [12275-6]
- 12275 08 **A simulation into the physical and network layers of optical communication network for the subsea video surveillance of illicit activity** [12275-7]

SESSION 3 IDENTITY AND DOCUMENT VERIFICATION

- 12275 09 **Speckle pattern analysis of security holograms and related foils for quality assessment and authentication** [12275-8]
- 12275 0A **Examination of fingerprint separation methods based on hyperspectral data measured from latent overlapping fingerprints** [12275-9]
- 12275 0B **Combatting fraud on travel, identity, and breeder documents** [12275-10]
- 12275 0C **A cognitive camera system for increasing face recognition performance in backlit conditions** [12275-11]

SESSION 4 AI-BASED SURVEILLANCE AND DETECTION

- 12275 0D **Rapid person re-identification retraining strategy for flexible deployment in new environments**
[12275-12]
- 12275 0E **Federated tool for anonymization and annotation in image data** [12275-13]
- 12275 0F **APMD: Adversarial Pixel Masking Derivative for multispectral object detectors** [12275-14]
- 12275 0G **Real-time target classification and tracking by using outdoor PTZ cameras at the edge**
[12275-15]
- 12275 0H **Centralized tracking and bidirectional long short-term memory for abnormal behaviour
recognition** [12275-16]
- 12275 0I **Using non-linear activation functions to increase robustness of AI models to adversarial attacks**
[12275-17]

POSTER SESSION

- 12275 0J **Detection of objects hidden behind various barriers using the THz radiovision method**
[12275-19]
- 12275 0K **Block-based multi-scale haze image enhancement method for surveillance application**
[12275-20]
- 12275 0L **Image enhancement based on multi-scale transform domain technique for visual surveillance
application** [12275-21]
- 12275 0M **A vision system using depth inpainting for virtual content reconstruction in augmented reality**
[12275-22]