

PROCEEDINGS OF SPIE

Electro-Optical and Infrared Systems: Technology and Applications XVI

**Duncan L. Hickman
Helge Bürsing**
Editors

**11–12 September 2019
Strasbourg, France**

Sponsored by
SPIE

Cooperating Organisations
European Optical Society
Cranfield University (United Kingdom)

Published by
SPIE

Volume 11159

Proceedings of SPIE 0277-786X, V. 11159

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 SPIEDigitalLibrary.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 *Electro-Optical and Infrared Systems: Technology and Applications XVI*, edited by Duncan L. Hickman, Helge Bürsing, Proceedings of SPIE Vol. 11159 (SPIE, Bellingham, WA, 2019) Seven-digit Article CID Number.

ISSN: 0277-786X
ISSN: 1996-756X (electronic)

ISBN: 9781510630215
ISBN: 9781510630222 (electronic)

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 © 2019, 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 \$21.00 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/19/\$21.00.

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**

SPIEDigitalLibrary.org

Paper Numbering: *Proceedings of SPIE* follow an e-First publication model. A unique citation identifier (CID) number is assigned to each article 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

vii	<i>Authors</i>
ix	<i>Conference Committee</i>

SENSOR TECHNOLOGY AND DEVICES I

11159 03	Silver nanowires: a new nanomaterial with advances for electrical, optical and IR systems (Invited Paper) [11159-2]
11159 04	Ghost imaging in the frequency domain with a high brilliance coherent monochromatic source: a novel approach to extend spectroscopy sensitivity beyond detectors limits [11159-3]
11159 05	Theoretic approach to ghost imaging in the frequency domain performed by means of a high brilliance coherent monochromatic source [11159-4]

SENSOR TECHNOLOGY AND DEVICES II

11159 06	Low-light-level SWIR photodetectors based on the InGaAs material system (Invited Paper) [11159-5]
11159 07	Sensor for security and safety applications based on a fully integrated monolithic electro-optic programmable micro diffracting device (Invited Paper) [11159-6]
11159 08	Ultrathin tunable terahertz absorbers based on electrostatically actuated metamaterial (Invited Paper) [11159-7]

SYSTEMS AND APPLICATIONS I

11159 0B	Fast decay solid-state scintillators for high-speed x-ray imaging [11159-10]
11159 0C	Influence of phosphor screen color on performance with modern night vision goggles [11159-11]
11159 0D	The development of a multi-band handheld fusion camera [11159-12]
11159 0E	Comparison of a kaleidoscope-based multi-view infrared system with its TOMBO-based counterpart [11159-13]

SYSTEMS AND APPLICATIONS II

11159 OI **Developing a control architecture for highly accurate multi-axis inertial stabilized platform** [11159-17]

EUROPEAN DEFENCE AGENCY SPECIAL SESSION

11159 OK **ECOMOS software structure and key features (Invited Paper)** [11159-18]

11159 OL **The project SPIDVE: study on EO Sensors Performance Improvement in Degraded Visual Environment** [11159-19]

11159 OM **Architectures for radiofrequency and optronics sensors onboard Remotely Piloted Aerial Systems (RPAS)** [11159-20]

11159 ON **Radiation-induced degradation of optoelectronic sensors** [11159-21]

MODELLING AND SIMULATION I

11159 OP **Assessing detection performance of night vision VIS/LWIR-fusion (Invited Paper)** [11159-23]

11159 OQ **Data collection and preliminary results on turbulence characterisation and mitigation techniques (Invited Paper)** [11159-24]

11159 OR **Infrared system simulation of airborne target detection on space-based platform (Invited Paper)** [11159-25]

MODELLING AND SIMULATION II

11159 OS **Kinematic analysis of imaging seekers with roll-over-nod gimbal and a folded electro-optical layout (Invited Paper)** [11159-26]

11159 OT **Feedback control method for limiting interfering Gaussian beams in a bistatic substance-on-surface chemical recognizer** [11159-28]

11159 OU **Vessel track summarization by viewpoint selection** [11159-32]

PROCESSING AND ANALYSIS

11159 OV **Pixel-wise infrared tone remapping for rapid adaptation to high dynamic range variations (Invited Paper)** [11159-30]

POSTER SESSION

- 11159 0Y **Improving the stabilization level of ISP system using feedforward compensators [11159-27]**
- 11159 10 **A simple method for determining distances by range-gated vision systems with different forms of illuminating pulses [11159-35]**