

PROCEEDINGS OF SPIE

Automatic Target Recognition XXXVI

**Kenny Chen
Riad I. Hammoud
Timothy L. Overman**
Editors

**27–29 April 2026
National Harbor, Maryland, United States**

Sponsored by
SPIE

Cosponsored by
Lockheed Martin Corp. (United States)

Published by
SPIE

Volume 14031

Proceedings of SPIE 0277-786X, V. 14031

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 *Automatic Target Recognition XXXVI*, edited by Kenny Chen, Riad I. Hammoud, Timothy L. Overman, Proc. of SPIE 14031, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9798902320180

ISBN: 9798902320197 (electronic)

Published by

SPIE

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

Telephone +1 360 676 3290 (Pacific Time)

SPIE.org

Copyright © 2026 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

v *Conference Committee*

PHYSICS-DRIVEN INTELLIGENCE: CLASSICAL METHODS REIMAGINED FOR MODERN ATR

- 14031 02 **Fast passive infrared detection and trajectory estimation of UAVs using a physics-based GLRT and hierarchical superparameter mapping** [14031-1]
- 14031 04 **Impact of denoising on radar target classification** [14031-3]
- 14031 05 **Work smarter, not harder: simple classifiers can make simple work of common SAR ATR datasets (Best Student Paper Award)** [14031-4]

SYNTHETIC WORLDS, REAL IMPACT: ROBUST ATR THROUGH DOMAIN GAPS, PRIVACY, AND OOD DEFENSE

- 14031 06 **Understanding differential privacy for ATR template generation** [14031-6]
- 14031 07 **The curious case of the odd OOD data** [14031-7]
- 14031 08 **Multinomial feature matching for out-of-distribution detection in synthetic aperture radar (Best Paper Award)** [14031-9]
- 14031 09 **Cross-modal novel class discovery for ATR: a JEPa approach (Invited Paper)** [14031-28]

BEYOND PIXELS: MULTIMODAL REASONING WITH VLMS, LLMS, AND GEOSPATIAL INTELLIGENCE

- 14031 0B **Geospatial-temporal sensemaking of remote sensing activity detections with multimodal large language model** [14031-11]
- 14031 0C **Artificial intelligence in multi-object recognition and persistent tracking** [14031-12]

ADVANCED SENSING AND FAST ATR: LIDAR, RADAR, AND NEUROMORPHIC EVENT PROCESSING AND NEUROMORPHIC EVENT SENSING

- 14031 0D **Robust multitask SAR ATR with outlier detection for persistent false alarm discrimination** [14031-16]
- 14031 0E **Remote flash-LiDAR dataset and deep learning benchmarks for long-range object detection and segmentation** [14031-14]

- 14031 OF **Blink and you'll miss it: event-based data synthesis for fast-moving object detection in constrained platforms** [14031-15]
- 14031 OG **Frequency-domain event-based imaging for selective surveillance** [14031-17]
- 14031 OH **SAR-RAG: ATR visual question answering by semantic search, retrieval, and MLLM generation (Best Student Paper Award)** [14031-27]

SESSION OF INTEREST ON ARTIFICIAL INTELLIGENCE: JOINT SESSION WITH CONFERENCES 14029 AND 14031

- 14031 OI **Inexpensive adversarially trained infrared panels for evading automated target recognition** [14031-19]

ARTIFICIAL INTELLIGENCE II: JOINT SESSION WITH CONFERENCES 14031 AND 14037

- 14031 OJ **Real-time multiscale UAV detection via hybrid framework in infrared imagery** [14031-21]