PROCEEDINGS OF SPIE

SPIDigitalLibrary.org/conference-proceedings-of-spie

Front Matter: Volume 11870

, "Front Matter: Volume 11870," Proc. SPIE 11870, Artificial Intelligence and Machine Learning in Defense Applications III, 1187001 (5 October 2021); doi: 10.1117/12.2614952

Event: SPIE Security + Defence, 2021, Online Only

PROCEEDINGS OF SPIE

Artificial Intelligence and Machine Learning in Defense Applications III

Judith Dijk
Editor

13–17 September 2021
Online Only, Spain

Sponsored by
SPIE

Cooperating Organisations
European Optical Society
Cranfield University (United Kingdom)
CENSIS (United Kingdom)
SEDOPTICA (Spain)

Supporting Organisation
INEUSTAR/INDUCIENCIA (Spain)

Published by
SPIE

Volume 11870

Proceedings of SPIE 0277-786X, V. 11870

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

Artificial Intelligence and Machine Learning in Defense Applications III,
edited by Judith Dijk, Proc. of SPIE Vol. 11870, 1187001 · © 2021 SPIE
CCC code: 0277-786X/21/\$21 · doi: 10.1117/12.2614952

Proc. of SPIE Vol. 11870 1187001-1

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 *Artificial Intelligence and Machine Learning in Defense Applications III*, edited by Judith Dijk, Proc. of SPIE 11870, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510645844

ISBN: 9781510645851 (electronic)

Published by

SPIE

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

Telephone +1 360 676 3290 (Pacific Time)

SPIE.org

Copyright © 2021 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

AI APPLICATIONS I

- 11870 04 **Using temporal information for improved UAV type classification (Invited Paper)** [11870-1]
- 11870 06 **Automated operator support for vessel threat assessment** [11870-4]

AI APPLICATIONS II

- 11870 07 **Multi-sensor information extraction and combination in a large harbor surveillance experiment (Invited Paper)** [11870-5]
- 11870 09 **Enhancing learning-based computer vision algorithms accuracy in sUAS using navigation wide-angle cameras** [11870-7]
- 11870 0A **Bridging the gap from academia to application: rapid algorithm design and deployment for artificial intelligence (RADD-AI) (Invited Paper)** [11870-8]
- 11870 0B **On the automatic text detection and recognition algorithms for maritime images** [11870-9]

SIMULATIONS AND DATASETS

- 11870 0C **Simulated SAR for ATR pre-training (Invited Paper)** [11870-10]
- 11870 0D **SAR image generation using GANs with azimuth constraints for target classification** [11870-11]
- 11870 0E **Data augmentation using style transfer in SAR automatic target classification** [11870-12]
- 11870 0F **Image-to-image translation for improvement of synthetic thermal infrared training data using generative adversarial networks** [11870-13]
- 11870 0G **Dynamic vision sensor datasets in the maritime domain** [11870-14]

TRACKING AND LOCALISATION

- 11870 0H **Robot navigation using modified SLAM procedure based on depth image reconstruction** [11870-15]

11870 0I **Multi-object tracking with deep learning ensemble for unmanned aerial system applications**
[11870-17]

DETECTION AND CLASSIFICATION

11870 0J **Detecting aerial objects: drones, birds, and helicopters (Invited Paper)** [11870-18]

11870 0K **Hyperspectral anomaly detection of hidden camouflage objects based on convolutional autoencoder** [11870-19]

11870 0L **Classification of colorimetric sensor data using time series** [11870-20]

11870 0N **Vessel classification for naval operations** [11870-22]

POSTER SESSION

11870 0P **PCA compression of image deblurring neural networks** [11870-24]

11870 0Q **Scanning strategy learning for electronic support receivers by robust principal component analysis** [11870-25]