PROCEEDINGS OF SPIE

Disruptive Technologies in Information Sciences IV

Misty Blowers
Russell D. Hall
Venkateswara R. Dasari
Editors

27 April – 1 May 2020
Online Only, United States

Sponsored and Published by
SPIE

Volume 11419

Proceedings of SPIE 0277-786X, V. 11419

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 *Disruptive Technologies in Information Sciences IV*, edited by Misty Blowers, Russell D. Hall, Venkateswara R. Dasari, Proceedings of SPIE Vol. 11419 (SPIE, Bellingham, WA, 2020) Seven-digit Article CID Number.

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

ISBN: 9781510636156
ISBN: 9781510636163 (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 © 2020, 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/20/$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

VISUALILZATION TOOLS AND TECHNOLOGIES

11419 02 **A terabyte-scale geometry query engine for the generation of synthetic radiative transfer sensor imagery** [11419-1]

11419 04 **Optic disc localization in retinal images using deep learning frameworks** [11419-3]

TACTICAL MILITARY OPERATIONS

11419 07 **A cost model of communication in distributed tactical environment computations** [11419-6]

11419 08 **A novel approach towards computing global maps for multi-robotic operations in tactical environments (Invited Paper)** [11419-7]

11419 09 **Adaptive computation at the tactical edge using a proactive resource allocator for reduced latencies (Invited Paper)** [11419-8]

ADVANCED SOLUTIONS FOR SECURING HARDWARE

11419 0B **A zero-sum game theoretic approach for mitigating counterfeit integrated circuits in supply chain (Invited Paper)** [11419-10]

11419 0C **Variable word length: a quantum-proof encryption solution** [11419-13]

ADVANCED HARDWARE ARCHITECTURES

11419 0F **Solving machine learning optimization problems using quantum computers** [11419-16]

CYBERSECURITY AND MACHINE LEARNING

11419 0G **Assuring autonomy (Invited Paper)** [11419-17]

11419 0I **Artificial intelligence presents new challenges in cybersecurity** [11419-19]

ADVANCED COMPUTER ALGORITHMS

11419 0K **Deep learning for modulation and coding rate classification of OFDM** [11419-23]

11419 0L **Analysis of possible frameworks for a graphical query editor in a web application** [11419-24]

11419 0M **Compression artifact mitigation for face in video recognition** [11419-25]

ENABLING NEXT GEN COMMUNICATIONS NETWORKS I

11419 0N **Detection and isolation of black hole attack in mobile ad hoc networks: a review** [11419-27]

11419 0O **The network link outlier factor (NLOF)** [11419-28]

11419 0P **Learning lessons from smart phone developers for cyber physical systems** [11419-29]

ENABLING NEXT GEN COMMUNICATION NETWORKS II

11419 0Q **Evaluating features for network application classification** [11419-30]