

PROCEEDINGS OF SPIE

Pattern Recognition and Tracking
XXIX

Mohammad S. Alam
Editor

18–19 April 2018
Orlando, Florida, United States

Sponsored and Published by
SPIE

Volume 10649

Proceedings of SPIE 0277-786X, V. 10649

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 *Pattern Recognition and Tracking XXIX*, edited by Mohammad S. Alam, Proceedings of SPIE Vol. 10649 (SPIE, Bellingham, WA, 2018) Seven-digit Article CID Number.

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

ISBN: 9781510618091
ISBN: 9781510618107 (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 © 2018, 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 \$18.00 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/18/\$18.00.

Printed in the United States of America Vm7 i ffUb 5gg: WJUH g' bWzi bXYf' JW bg' Zca CD-9.

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

SPIE. DIGITAL LIBRARY
SPIDigitalLibrary.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>

NOVEL PATTERN RECOGNITION AND TRACKING SYSTEMS

10649 02	A systematic evaluation of recent deep learning architectures for fine-grained vehicle classification (Invited Paper) [10649-1]
10649 03	A simplification of the Shor quantum factorization algorithm employing a quantum Hadamard transform (Invited Paper) [10649-2]
10649 04	Deep neural network for precision multi-band infrared image segmentation (Invited Paper) [10649-3]

NOVEL DETECTION ALGORITHMS

10649 05	Image-based flight data recording for United States Air Force aircraft [10649-4]
10649 06	Efficient anomaly detection algorithms for summarizing low quality videos [10649-5]
10649 07	The development of a video browsing and video summary review tool [10649-6]
10649 08	Comparative study of local binary pattern and its shifted variant for osteoporosis identification [10649-8]
10649 09	A composite framework for segregating x-rays of osteoporotic cases from healthy controls [10649-9]

NEURAL NETWORK BASED DETECTION AND TRACKING

10649 0B	Wildland fires detection and segmentation using deep learning [10649-11]
10649 0C	ASIFT based recognition of fixed shape moving objects and tracking via modified particle filters [10649-14]

MOTION SENSING AND ESTIMATION ALGORITHMS

10649 0D	Nanosensor network for 3D+T motion analysis [10649-15]
----------	---

- 10649 OE **ATR performance improvement using images with corrupted or missing pixels** [10649-16]
- 10649 OF **Anomaly detection in low quality traffic monitoring videos using optical flow** [10649-17]
- 10649 OG **A fast method for detecting and estimating motion in radar images using normalized cross-correlation** [10649-18]
- 10649 OH **Automated WAMI system calibration procedure based on multi-scale fusion and adaptive data association for geo-coding error correction** [10649-19]
- 10649 OI **Vehicle tracking in full motion video using the progressively expanded neural network (PENNet) tracker** [10649-20]
- 10649 OJ **Road sign identification and geolocation using JTC and VIAPIX module** [10649-21]

BIOMETRIC RECOGNITION

- 10649 OK **PCA and LDA based classifiers for osteoporosis identification** [10649-23]
- 10649 OL **Biometric based human recognition using gait energy images** [10649-24]
- 10649 OM **A comparative study of CFs, LBP, HOG, SIFT, SURF, and BRIEF techniques for face recognition** [10649-25]
- 10649 ON **Convolutional neural network based image segmentation: a review** [10649-26]

DEEP LEARNING BASED PATTERN RECOGNITION

- 10649 OR **Stochastic gradient descent implementation of the modified forward-backward linear prediction** [10649-32]
- 10649 OS **Approximate regularized least squares algorithm for classification** [10649-33]
- 10649 OT **Occluded object reconstruction for first responders with augmented reality glasses using conditional generative adversarial networks** [10649-34]
- 10649 OU **Augmented reality data generation for training deep learning neural network** [10649-35]

NOVEL FILTERING STRATEGIES

- 10649 OV **Real-time holographic heterodyne spatial filtering** [10649-36]

- 10649 OW **Real-time holographic deconvolution for image differentiation** [10649-37]
- 10649 OY **Low-complexity algorithm using DCT approximation for POST-HEVC standard** [10649-39]
- 10649 OZ **Comparison of SIFT and ASIFT based filters for better recognition and tracking in a remote scene environment** [10649-40]
- 10649 10 **A multi-component based volumetric directional pattern for texture feature extraction from hyperspectral imagery** [10649-41]
- 10649 11 **Energy criterion in correlation-based face recognition applications** [10649-42]

POSTER SESSION

- 10649 12 **Bayesian belief network modeling of direct numerically simulated imagery variables for sub-surface structure diagnostics** [10649-12]
- 10649 13 **Pre-screener for automatic detection of road damage in SAR imagery via advanced image processing techniques** [10649-30]
- 10649 14 **Parallax rectification and stabilization technique for multiple objects tracking in wide area surveillance system** [10649-43]
- 10649 15 **Benchmarking deep learning trackers on aerial videos** [10649-44]