

PROCEEDINGS OF SPIE

Real-Time Image and Video Processing 2018

**Nasser Kehtarnavaz
Matthias F. Carlsohn**
Editors

**16–17 April 2018
Orlando, Florida, United States**

Sponsored and Published by
SPIE

Volume 10670

Proceedings of SPIE 0277-786X, V. 10670

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

Real-Time Image and Video Processing 2018, edited by Nasser Kehtarnavaz,
Matthias F. Carlsohn, Proc. of SPIE Vol. 10670, 1067001 · © 2018 SPIE
CCC code: 0277-786X/18/\$18 · doi: 10.1117/12.2502372

Proc. of SPIE Vol. 10670 1067001-1

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 *Real-Time Image and Video Processing 2018*, edited by Nasser Kehtarnavaz, Matthias F. Carlsohn, Proceedings of SPIE Vol. 10670 (SPIE, Bellingham, WA, 2018) Seven-digit Article CID Number.

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

ISBN: 9781510618510
ISBN: 9781510618527 (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.

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

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

SESSION 1 REAL-TIME ALGORITHMS I

10670 02	On the parallel classification system using hyperspectral images for remote sensing applications [10670-1]
10670 03	Robust enhancement technique for color images corrupted by impulsive noise [10670-2]
10670 04	Blind image sharpness metric based on edge and texture features [10670-3]
10670 05	Extraction of vital signs using real time video analysis for neonatal monitoring [10670-4]
10670 06	Real time demosaicking and superresolution of multispectral images [10670-5]

SESSION 2 REAL-TIME HARDWARE IMPLEMENTATION

10670 07	An efficient dense descriptor applied to 3D vision implemented on parallel computing [10670-6]
10670 08	Computationally efficient blood vessels segmentation in fundus image on shared memory parallel machines [10670-7]
10670 0A	A high-speed driver for silicon photonics Mach-Zehnder modulator for high data-rate transfer of particle collision images in high-energy physics and in medical physics [10670-9]

SESSION 3 REAL-TIME ALGORITHMS II

10670 0B	A computationally efficient pipeline for 3D point cloud reconstruction from video sequences [10670-10]
10670 0C	Real-time lung segmentation from whole-body CT scans using Adaptive Vision Studio: a visual programming software suite [10670-11]
10670 0D	Evolutionary cortical surface segmentation [10670-12]
10670 0F	Performance analysis of real-time DNN inference on Raspberry Pi [10670-14]

SESSION 4 REAL-TIME VIDEO SYSTEMS

- 10670 0G **Computational efficiency of optic disk detection on fundus image: a survey** [10670-15]
- 10670 0H **Impact of segment size on dynamic adaptive video streaming over HTTP (DASH) over LAN network** [10670-16]
- 10670 0I **Real-time image and video processing for advanced services on-board vehicles for passenger transport** [10670-17]

POSTER SESSION

- 10670 0J **Real-time kinematics for accurate geolocalization of images in telerobotic applications** [10670-18]
- 10670 0L **Real-time stereovision framework for underwater drone maneuvering** [10670-20]
- 10670 0M **Person re-identification by semi-supervised dictionary rectification learning** [10670-21]
- 10670 0N **A vehicle real-time detection algorithm based on YOLOv2 framework** [10670-22]
- 10670 0O **A sparse dimension-reduction based person re-identification algorithm** [10670-23]
- 10670 0P **Discriminative deep transfer metric learning for cross-scenario person re-identification** [10670-24]

Authors

Numbers in the index correspond to the last two digits of the seven-digit citation identifier (CID) article numbering system used in Proceedings of SPIE. The first five digits reflect the volume number. Base 36 numbering is employed for the last two digits and indicates the order of articles within the volume. Numbers start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B...0Z, followed by 10-1Z, 20-2Z, etc.

Akil, Mohamed, 08, 0G
Alzahrani, Ibrahim Rizqallah, 0H
Amira, Abbas, 0H
Bedoui, Mohamed Hedi, 0G
Ben Sayadia, Sofien, 0G
Carmona-Galán, Ricardo, 0F
Chang, Chih-Hsiang, 0B
Chen, Fuhua, 0M, 0O
Chen, Shoubing, 0P
Ciarpì, G., 0A
Cygarek, Bogusław, 03, 0L
Czardybon, Michal, 0C
Ding, Zongyuan, 0M
Dudzik, Wojciech, 0D
Elloumi, Yaroub, 08, 0G
Fernández-Berni, Jorge, 0F
García-Salgado, Beatriz P., 02
Geng, Lei, 0O
Grecos, Christos, 04
Indic, Premananda, 05
Jin, Cui, 0P
Jovanov, Ljubomir, 06
Kawulok, Michal, 03, 0D
Kehtarnavaz, Nasser, 0B
Liu, Suolan, 0M
Lohani, Bhushan, 05
Magazzu, G., 0A
Maheshwary, Priti, 04
Nalepa, Jakub, 03, 0C, 0D
Ni, Tongguang, 0M, 0P
Philips, Wilfried, 06
Ponomaryov, Volodymyr I., 02, 07
Ramzan, Naeem, 0H
Robles-Gonzalez, Cesar Marco A., 02, 07
Rodríguez-Vázquez, Ángel, 0F
Rosas-Miranda, Dario I., 07
Sadovnychiy, Sergiy, 02
Saponara, Sergio, 0A, 0I, 0J
Shirvaikar, Mukul, 04, 05
Smotka, Bogdan, 03, 0D, 0L
Sun, Jinyu, 0O
Velasco-Montero, Delia, 0F
Walczak, Maksym, 0C, 0D
Wan, Jianwu, 0O
Wang, Chong, 0O
Wang, Hongyuan, 0M, 0N, 0O, 0P
Yang, Wei, 0N
Zhang, Ji, 0N
Zhang, Wenwen, 0O

Conference Committee

Symposium Chair

Robert D. Fiete, Harris Corporation (United States)

Symposium Co-chair

Jay Kumler, JENOPTIK Optical Systems, LLC (United States)

Conference Chairs

Nasser Kehtarnavaz, The University of Texas at Dallas (United States)

Matthias F. Carlsohn, Computer Vision and Image Communication at
Bremen (Germany)

Conference Program Committee

Mohamed Akil, ESIEE (France)

Guillermo Botella, Universidad Complutense de Madrid (Spain)

Philip P. Dang, U.S. Department of Commerce (United States)

Touradj Ebrahimi, Ecole Polytechnique Fédérale de Lausanne
(Switzerland)

Barak Fishbain, Technion-Israel Institute of Technology (Israel)

Sergio R. Goma, Qualcomm Inc. (United States)

Christos Grecos, Central Washington University (United States)

Reinhard Koch, Christian-Albrechts-Universität zu Kiel (Germany)

Volodymyr Ponomaryov, Instituto Politécnico Nacional (Mexico)

Luis Salgado, Universidad Politécnica de Madrid (Spain)

Sergio Saponara, Università di Pisa (Italy)

Mukul V. Shirvaikar, The University of Texas at Tyler (United States)

Athanassios N. Skodras, University of Patras (Greece)

Bogdan Smolka, Silesian University of Technology (Poland)

Session Chairs

- 1 Real-Time Algorithms I
Nasser Kehtarnavaz, The University of Texas at Dallas (United States)
- 2 Real-Time Hardware Implementation
Mukul V. Shirvaikar, The University of Texas at Tyler (United States)
- 3 Real-Time Algorithms II
Matthias F. Carlsohn, Computer Vision and Image Communication at
Bremen (Germany)

- 4 Real-Time Video Systems
Christos Grecos, Central Washington University (United States)