

PROCEEDINGS OF SPIE

Visual Information Processing XXI

Mark Allen Neifeld
Amit Ashok
Editors

24–25 April 2012
Baltimore, Maryland, United States

Sponsored and Published by
SPIE

Volume 8399

Proceedings of SPIE, 0277-786X, v. 8399

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

Visual Information Processing XXI, edited by Mark Allen Neifeld, Amit Ashok, Proc. of SPIE
Vol. 8399, 839901 · © 2012 SPIE · CCC code: 0277-786X/12/\$18 · doi: 10.1117/12.979489

Proc. of SPIE Vol. 8399 839901-1

The papers included 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. The papers published in these proceedings 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 this book:

Author(s), "Title of Paper," in *Visual Information Processing XXI*, edited by Mark Allen Neifeld, Amit Ashok, Proceedings of SPIE Vol. 8399 (SPIE, Bellingham, WA, 2012) Article CID Number.

ISSN 0277-786X

ISBN 9780819490773

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 © 2012, 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/12/\$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, with papers published first online and then in print and on CD-ROM. Papers are published as they are submitted and meet publication criteria. A unique, consistent, permanent citation identifier (CID) number is assigned to each article at the time of the first 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, print, and electronic versions of the publication. SPIE uses a six-digit CID article numbering system in which:

- The first four 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. The complete citation is used on the first page, and an abbreviated version on subsequent pages. Numbers in the index correspond to the last two digits of the six-digit CID number.

Contents

vii *Conference Committee*

SESSION 1 SUPERRESOLUTION ALGORITHMS AND SYSTEM DESIGN

- 8399 02 **Toward automatic subpixel registration of unmanned airborne vehicle images** [8399-01]
A. H. Yousef, J. Li, M. Karim, Old Dominion Univ. (United States)
- 8399 03 **Confidence measures of optical flow estimation suitable for multiframe superresolution**
[8399-02]
A. V. Kanaev, U.S. Naval Research Lab. (United States)
- 8399 04 **Precise local blur estimation based on the first-order derivative** [8399-03]
H. Bouma, J. Dijk, A. W. M. van Eekeren, TNO (Netherlands)
- 8399 05 **Compressive imaging measurement design from an image patch manifold prior** [8399-04]
R. Muise, D. Bottisti, Lockheed Martin Missiles and Fire Control (United States)
- 8399 06 **Fast stochastic Wiener filter for superresolution image restoration with information theoretic
visual quality assessment** [8399-05]
A. H. Yousef, J. Li, M. Karim, Old Dominion Univ. (United States)

SESSION 2 IMAGE ANALYSIS I

- 8399 07 **Adaptive segmentation technique for automatic object region and boundary extraction for
activity recognition** [8399-06]
F. A. Albalooshi, V. K. Asari, Univ. of Dayton (United States)
- 8399 08 **A modified shifted means-based segmentation approach to detect active regions and
coronal holes in the solar dynamics observatory images** [8399-07]
S. Suresh, R. Dube, C. Glenn, Sr., Rochester Institute of Technology (United States)

SESSION 3 PATTERN RECOGNITION

- 8399 09 **Tracking individuals in surveillance video of a high-density crowd** [8399-09]
N. Hu, TNO (Netherlands) and Univ. of Amsterdam (Netherlands); H. Bouma, TNO
(Netherlands); M. Worring, Univ. of Amsterdam (Netherlands)
- 8399 0A **Sparse coding for hyperspectral images using random dictionary and soft thresholding**
[8399-10]
E. Oguslu, K. Iftekharuddin, J. Li, Old Dominion Univ. (United States)

SESSION 4 IMAGE ANALYSIS II

- 8399 OE **Multiplatform GPGPU implementation of the active contours without edges algorithm** [8399-14]
O. Zavala-Romero, A. Meyer-Baese, U. Meyer-Baese, The Florida State Univ. (United States);
- 8399 OF **Edge detection and localization with edge pattern analysis and inflection characterization** [8399-15]
B. Jiang, National Institute of Aerospace (United States)
- 8399 OH **Automatic road extraction from remote sensing images based on a Hessian matrix** [8399-17]
Y. Bae, J. H. Jang, J. B. Ra, KAIST (Korea, Republic of)

SESSION 5 IMAGE ENHANCEMENT

- 8399 OI **Ghost-free high-dynamic range imaging using layered exposed images based on local histogram equalization** [8399-18]
J. Im, H. Kim, T. Kim, Chung-Ang Univ. (Korea, Republic of); S. Lee, J. Bae, Hanwha Corp. (Korea, Republic of); J. Paik, Chung-Ang Univ. (Korea, Republic of)
- 8399 OJ **Scene-based nonuniformity correction in infrared videos** [8399-19]
Y. Bae, J. Lee, KAIST (Korea, Republic of); J. H. Lee, Agency for Defense Development (Korea, Republic of); J. B. Ra, KAIST (Korea, Republic of)
- 8399 OK **Infrared image denoising by nonlocal means filtering** [8399-20]
B. Dee-Noor, A. Stern, Y. Yitzhaky, N. Kopeika, Ben-Gurion Univ. of the Negev (Israel)
- 8399 OL **Adaptive smoothing in real-time image stabilization** [8399-21]
S. Wu, D. C. Zhang, Y. Zhang, J. Basso, M. Melle, SRI International Sarnoff (United States)

SESSION 6 THREE-DIMENSIONAL IMAGING

- 8399 OM **Surface reconstruction for 3D remote sensing** [8399-22]
M. S. Baran, R. L. Tutwiler, D. J. Natale, The Pennsylvania State Univ. (United States)
- 8399 ON **Dense point-cloud creation using superresolution for a monocular 3D reconstruction system** [8399-23]
Y. Diskin, V. K. Asari, Univ. of Dayton (United States)
- 8399 OO **A study of the sensitivity of long-range passive ranging techniques to atmospheric scintillation** [8399-24]
J. de Villiers, Council for Scientific and Industrial Research (South Africa) and Univ. of Cape Town (South Africa); F. Wilson, Council for Scientific and Industrial Research (South Africa); F. Nicolls, Univ. of Cape Town (South Africa)
- 8399 OP **A method for 3D scene recognition using shadow information and a single fixed viewpoint** [8399-25]
D. C. Bamber, J. D. Rogers, S. F. Page, Digital Barriers plc (United Kingdom)

SESSION 7 IMAGE RECONSTRUCTION

- 8399 OQ **Mean squared error performance of MFB nonlinear scene reconstruction using speckle imaging in horizontal imaging applications** [8399-26]
G. E. Archer, J. P. Bos, M. C. Roggemann, Michigan Technological Univ. (United States)
- 8399 OR **MTF compensation algorithm based on blind deconvolution for high-resolution remote sensing satellite** [8399-27]
J. Lee, J. Chun, KAIST (Korea, Republic of); D. Lee, Korea Aerospace Research Institute (Korea, Republic of)
- 8399 OS **A comparison of some predictors of stereoscopic match correctness** [8399-28]
V. Petran, Artificial Perception Technologies Inc. (United States) and Case Western Reserve Univ. (United States); F. Merat, Case Western Reserve Univ. (United States)

POSTER SESSION

- 8399 OT **End-to-end image quality assessment** [8399-29]
J. Raventos, Nightline, Inc. (United States)
- 8399 OU **Novel multiplexed coaxial holographic storage technique** [8399-30]
Z. Chen, City Univ. of Hong Kong (Hong Kong, China); W. Jia, City Univ. of Hong Kong (Hong Kong, China) and Shanghai Institute of Optics and Fine Mechanics (China); T. Chung, F. J. Wen, Y. T. Chow, P. S. Chung, City Univ. of Hong Kong (Hong Kong, China)
- 8399 OX **Quantifying focus criterion function comparison for two-stage autofocusing system** [8399-31]
Q. Liang, Y. Qu, BeiHang Univ. (China)

Author Index

Conference Committee

Symposium Chair

Kevin P. Meiners, Office of the Secretary of Defense (United States)

Symposium Cochair

Kenneth R. Israel, Lockheed Martin Corporation (United States)

Conference Chairs

Mark Allen Neifeld, The University of Arizona (United States)

Amit Ashok, The University of Arizona (United States)

Program Committee

Gary W. Euliss, The MITRE Corporation (United States)

Richard D. Juday, NASA Johnson Space Center (United States)

Ram M. Narayanan, The Pennsylvania State University (United States)

John Pellegrino, U.S. Army Research Laboratory (United States)

Robert A. Schowengerdt, The University of Arizona (United States)

Joseph van der Gracht, HoloSpex, Inc. (United States)

Session Chairs

- 1 Superresolution Algorithms and System Design
Amit Ashok, The University of Arizona (United States)
- 2 Image Analysis I
Ram M. Narayanan, The Pennsylvania State University (United States)
- 3 Pattern Recognition
Amit Ashok, The University of Arizona (United States)
- 4 Image Analysis II
Michael E. Gehm, The University of Arizona (United States)
- 5 Image Enhancement
Amit Ashok, The University of Arizona (United States)
- 6 Three-Dimensional Imaging
Jiang Li, Old Dominion University (United States)

- 7 Image Reconstruction
Mark Allen Neifeld, The University of Arizona (United States)