PROCEEDINGS OF SPIE

SPIDigitalLibrary.org/conference-proceedings-of-spie

Front Matter: Volume 10203

, "Front Matter: Volume 10203," Proc. SPIE 10203, Pattern Recognition and Tracking XXVIII, 1020301 (16 June 2017); doi: 10.1117/12.2270674

SPIE.

Event: SPIE Defense + Security, 2017, Anaheim, CA, United States

PROCEEDINGS OF SPIE

Pattern Recognition and Tracking XXVIII

Mohammad S. Alam

Editor

12–13 April 2017

Anaheim, California, United States

Sponsored and Published by
SPIE

Volume 10203

Proceedings of SPIE 0277-786X, V. 10203

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

Pattern Recognition and Tracking XXVIII, edited by Mohammad S. Alam, Proc. of SPIE Vol.
10203, 1020301 · © 2017 SPIE · CCC code: 0277-786X/17/\$18 · doi: 10.1117/12.2270674

Proc. of SPIE Vol. 10203 1020301-1

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 *Pattern Recognition and Tracking XXVIII*, edited by Mohammad S. Alam, Proceedings of SPIE Vol. 10203 (SPIE, Bellingham, WA, 2017) Seven-digit Article CID Number.

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510609075

ISBN: 9781510609082 (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 © 2017, 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/17/\$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	Authors
vii	Conference Committee

SESSION 1	NOVEL PATTERN RECOGNITION AND TRACKING
10203 02	Contemporary deep recurrent learning for recognition (Invited Paper) [10203-1]
10203 03	Intelligent multi-spectral IR image segmentation (Invited Paper) [10203-2]
10203 05	Comparative analysis of zero aliasing logarithmic mapped optimal trade-off correlation filter [10203-4]
10203 06	Feature extraction for deep neural networks based on decision boundaries [10203-6]
SESSION 2	INVARIANT RECOGNITION
10203 07	Fully invariant wavelet enhanced minimum average correlation energy filter for object recognition in cluttered and occluded environments [10203-8]
10203 08	Wavelet filtered shifted phase-encoded joint transform correlation for face recognition [10203-9]
10203 09	Multispectral iris recognition based on group selection and game theory [10203-10]
10203 0A	Phase conjugate Michelson interferometer for optical logic [10203-11]
SESSION 3	UNCONVENTIONAL PATTERN RECOGNITION TECHNIQUES
10203 0C	Point based interactive image segmentation using multiquadrics splines [10203-12]
10203 0D	Utilization of the modified forward backward linear predication approach to isolate anomalous events [10203-13]
10203 0E	Time-to-impact estimation in passive missile warning systems [10203-15]
10203 0F	Compressed imagery detection rate through map seeking circuit, and histogram of oriented gradient pattern recognition [10203-16]

SESSION 4 BIOMETRIC RECOGNITION

- 10203 0G **2D DOST based local phase pattern for face recognition** [10203-18]
- 10203 0H **Multi-texture local ternary pattern for face recognition** [10203-19]
- 10203 0J **All optical logic for optical pattern recognition and networking applications** [10203-21]

SESSION 5 IMPLEMENTATION FOR PATTERN RECOGNITION

- 10203 0M **Rapid prototyping of SoC-based real-time vision system: application to image preprocessing and face detection** [10203-24]
- 10203 0N **FPGA design of correlation-based pattern recognition** [10203-25]
- 10203 0O **Graph clustering for weapon discharge event detection and tracking in infrared imagery using deep features (Invited Paper)** [10203-28]

POSTER SESSION

- 10203 0P **Image encryption with chaotic map and Arnold transform in the gyrator transform domains** [10203-26]
- 10203 0Q **Comparison of sub-scaled to full-scaled aircrafts in simulation environment for air traffic management** [10203-27]

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.

Abbas, Muhammad, 05	Torres, Gilbert, 03
Ahmad, Foysal, 09	Vidyaratne, L., 02
Alam, M., 02	Woo, Seongyoun, 06
Alam, Mohammad S., 07, 08, 0G, 0P	Young, Rupert, 05
Alfalou, Ayman, 0M, 0N	Zhao, Jun, 0P
Asari, Vijayan, 0H	
Bhattacharjee, Sreyasee Das, 0O	
Bilal, Ahmed, 05	
Cai, Bin, 0P	
Chao, Tien-Hsin, 03	
Chaudry, Qaiser, 05	
Chen, Kang, 03	
Chow, Edward, 03	
Creusere, Charles C., 0F	
Duraisamy, Prakash, 0C	
Elbakary, Mohamed I., 0Q	
Essa, Almbrok, 0H	
Hassan, Ali, 07	
Heim, Stephen, 03	
Iftikharuddin, Khan M., 02, 0Q	
Jridi, Maher, 0M, 0N	
Khan, Muazzam, 07	
Khoury, Jed, 0A, 0J	
Lee, Chulhee, 06	
Lu, Thomas, 03	
Luo, Hongling, 0P	
Luong, Andrew, 03	
Meena, Sachin, 0C	
Moniruzzaman, Md., 08, 0G	
Newman, Brett, 0Q	
Newton, Kathy A., 0F	
Palanniapan, Kannappan, 0C	
Papelis, Yiannis, 0Q	
Patel, Maharshi, 03	
Rehman, Saad, 05, 07	
Riasati, Vahid R., 0D	
Riaz, Farhan, 07	
Roy, Kaushik, 09	
Saeed, Omer, 05, 07	
Şahingil, Mehmet Cihan, 0E	
Sang, Jun, 0P	
Seetharaman, Guna, 0C	
Shelton, Joseph, 09	
Talukder, Ashit, 0O	
Tehsin, Sara, 05, 07	

Conference Committee

Symposium Chair

Donald A. Reago Jr., U.S. Army Night Vision & Electronic Sensors
Directorate (United States)

Symposium Co-chair

Arthur A. Morrish Raytheon Space and Airborne Systems
(United States)

Conference Chair

Mohammad S. Alam, Texas A&M University-Kingsville (United States)

Conference Program Committee

Ayman Alfalou, ISEN Brest (France)
Vijayan K. Asari, University of Dayton (United States)
Tien-Hsin Chao, Jet Propulsion Laboratory (United States)
Khan M. Iffekharuddin, Old Dominion University (United States)
Bahram Javidi, University of Connecticut (United States)
Jed Khoury, Lartec, Inc. (United States)
Vahid R. Riasati, Raytheon Space and Airborne Systems
(United States)
Wesam A. Sakla, Air Force Research Laboratory (United States)
Robert C. Stirbl, Jet Propulsion Laboratory (United States)
Ashit Talukder, The University of North Carolina at Charlotte
(United States)
Rupert C. D. Young, University of Sussex (United Kingdom)

Session Chairs

- 1 Novel Pattern Recognition and Tracking
Mohammad S. Alam, Texas A&M University-Kingsville (United States)
- 2 Invariant Recognition
Khan M. Iffekharuddin, Old Dominion University (United States)
- 3 Unconventional Pattern Recognition Techniques
Mohammad S. Alam, Texas A&M University-Kingsville (United States)
- 4 Biometric Recognition
Mohammad S. Alam, Texas A&M University-Kingsville (United States)

- 5 Implementation for Pattern Recognition
Vahid R. Riasati, Raytheon Space and Airborne Systems
(United States)