PROCEEDINGS OF SPIE

Multisensor, Multisource Information Fusion: Architectures, Algorithms, and Applications 2015

Jerome J. Braun Chair

21 April 2015 Baltimore, Maryland, United States

Sponsored and Published by SPIE

Volume 9498

Proceedings of SPIE 0277-786X, V. 9498

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

Multisensor, Multisource Information Fusion: Architectures, Algorithms, and Applications 2015, Proc. of SPIE Vol. 9498, 949801 \cdot © 2015 SPIE \cdot CCC code: 0277-786X/15/\$18 \cdot doi: 10.1117/12.2199876

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 Multisensor, Multisource Information Fusion: Architectures, Algorithms, and Applications 2015, Proceedings of SPIE Vol. 9498 (SPIE, Bellingham, WA, 2015) Article CID Number.

ISSN: 0277-786X ISBN: 9781628416145

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 © 2015, 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/15/\$18.00.

Printed in the United States of America.

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



Paper Numbering: Proceedings of SPIE follow an e-First publication model, with papers published first online and then in print. Papers are published as they are submitted and meet publication criteria. A unique 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.

Contents

v Authors vii Conference Committee

SESSION 1	INFORMATION FUSION APPROACHES AND ALGORITHMS I
9498 02	An asset valuation approach using fuzzy logic [9498-1]
9498 03	Reliable sources and uncertain decisions in multisensor systems [9498-2]
9498 04	STAC: a comprehensive sensor fusion model for scene characterization [9498-4]
SESSION 2	INFORMATION FUSION APPROACHES AND ALGORITHMS II
9498 05	Better-than-the-best fusion algorithm with application in human activity recognition [9498-5]
9498 06	A theoretical performance analysis of discrete data classification when fusing two features [9498-6]
9498 07	Flight plan optimization [9498-7]
SESSION 3	INFORMATION FUSION APPROACHES AND ALGORITHMS III
9498 08	Pragmatic open space box utilization: asteroid survey model using distributed objects management based articulation (DOMBA) [9498-8]
9498 0A	Uncertainty characterization using copulas for classification [9498-10]
SESSION 4	INFORMATION FUSION AND ROBOTICS
9498 OB	Effects of using a 3D model on the performance of vision algorithms [9498-12]
9498 OD	Evaluation of parallel reduction strategies for fusion of sensory information from a robot team [9498-14]
9498 OE	Performance measurement of mobile manipulators [9498-15]

Proc. of SPIE Vol. 9498 949801-4

Authors

Numbers in the index correspond to the last two digits of the six-digit citation identifier (CID) article numbering system used in Proceedings of SPIE. The first four 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.

Adistambha, Keyne D., 07 Allen, Thomas G., 0A Benjamin, D. Paul, OB Bostelman, Roger, OE Choi, Sora, 0A Dharmaseelan, Anoop, 07 Gupta, Shalabh, 05 Hong, Tsai, 0E Johnson, Kevin, 03 Kennedy, Chris, 04 Kira, Zsolt, 04 Leroy, Joseph, 0D Leung, Henry, 02 Lynch, Robert, 06, 0B Lyons, Damian M., OB, OD Marvel, Jeremy, 0E Minor, Christian, 03 Mohammad, Atif Farid, 08 Najjar, Nayeff, 05 Ozdemir, Onur, 0A Straub, Jeremy, 08 Tuell, Grady, 04 Varshney, Pramod K., 0A Wagner, Alan R., 04 Willett, Peter, 06 Zutty, Jason, 04

Proc. of SPIE Vol. 9498 949801-6

Conference Committee

Symposium Chair

Wolfgang Schade, Clausthal University of Technology and Fraunhofer Heinrich-Hertz Institute (Germany)

Symposium Co-chair

Ming C. Wu, University of California, Berkeley (United States)

Conference Chair

Jerome J. Braun (United States)

Conference Program Committee

Sheela V. Belur, The Van Dyke Technology Group, Inc. (United States) **D. Paul Benjamin**, Pace University (United States)

Belur V. Dasarathy, Information Fusion Technologies (United States)

Michael Heizmann, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany)

Charles F. Hester, U.S. Army Research, Development and Engineering Command (United States)

Mieczyslaw M. Kokar, Northeastern University (United States)

Damian M. Lyons, Fordham University (United States)

Mirela Popa, Chemring Detection Systems, Inc. (United States)

Firooz A. Sadjadi, Lockheed Martin Maritime Systems & Sensors (United States)

Pramod Kumar Varshney, Syracuse University (United States)

Shanchieh Jay Yang, Rochester Institute of Technology (United States)

Session Chairs

- Information Fusion Approaches and Algorithms I Jerome J. Braun (United States)
 Damian M. Lyons, Fordham University (United States)
- Information Fusion Approaches and Algorithms II
 D. Paul Benjamin, Pace University (United States)
 Damian M. Lyons, Fordham University (United States)

- Information Fusion Approaches and Algorithms III
 Damian M. Lyons, Fordham University (United States)
 D. Paul Benjamin, Pace University (United States)
- Information Fusion and Robotics Damian M. Lyons, Fordham University (United States) Jerome J. Braun (United States)