

PROCEEDINGS OF SPIE

Wireless Sensing and Processing III

Sohail A. Dianat
Michael D. Zoltowski
Editors

17–18 March 2008
Orlando, Florida, USA

Sponsored and Published by
SPIE

Volume 6980

Proceedings of SPIE, 0277-786X, v. 6980

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

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 *Wireless Sensing and Processing III*, edited by Sohail A. Dianat, Michael D. Zoltowski, Proceedings of SPIE Vol. 6980 (SPIE, Bellingham, WA, 2008) Article CID Number.

ISSN 0277-786X
ISBN 9780819471710

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 © 2008, 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/08/\$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 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 DIVERSITY AND MULTICARRIER TECHNIQUES

- 6980 02 **An investigation of constant-envelope variations of OFDM waveforms for use on HF multipath fading channels** [6980-01]
J. Nieto, Harris Corp. (USA)
- 6980 03 **Reduced dimension equalizer and interference canceller for MIMO-OFDM** [6980-02]
C. C. Lau, M. D. Zoltowski, Purdue Univ. (USA)
- 6980 04 **Carrier diversity via code spreaded OFDM** [6980-03]
M. Al-Mahmoud, M. D. Zoltowski, Purdue Univ. (USA)
- 6980 05 **Waveform diversity for wireless sensing** [6980-04]
T. Qureshi, M. Zoltowski, Purdue Univ. (USA)
- 6980 06 **OFDM LDPC performance comparison on an HF multipath fading channel** [6980-05]
F. C. Kellerman, Harris RF Communications (USA)

SESSION 2 RADIO FREQUENCY AND IDENTIFICATION (RFID)

- 6980 07 **An RF tag communication system model for noise radar** [6980-06]
Q. Pan, R. M. Narayanan, The Pennsylvania State Univ. (USA)
- 6980 08 **Smart radio: spectrum access for first responders** [6980-07]
M. D. Silvius, F. Ge, A. Young, A. B. MacKenzie, C. W. Bostian, Virginia Polytechnic Institute and State Univ. (USA)
- 6980 09 **Nonuniform pulse quantization for multiplication-free correlation in ultra-wideband receivers** [6980-08]
K. Naghdali, S. Dursun, D. Akopian, Univ. of Texas at San Antonio (USA)

SESSION 3 IMPLEMENTATION AND APPLICATION

- 6980 0A **An unattended ground sensor architecture for persistent border surveillance** [6980-09]
R. Johnson, Harris RF Communications (USA); G. Prado, SenTech Inc. (USA)
- 6980 0C **Application and analysis of reduced state techniques on hybrid CPM demodulation** [6980-24]
J. A. Norris, Harris Corp. (USA)

SESSION 4 SENSOR NETWORKS

- 6980 0D **Distributed event region detection in wireless sensor networks** [6980-11]
J. Fang, H. Li, Stevens Institute of Technology (USA); S. A. Quoraishee, M. E. Hohil, U.S. Army TACOM-ARDEC (USA)
- 6980 0E **A lightweight key distribution mechanism for wireless sensor networks** [6980-12]
S. Medidi, M. Medidi, L. E. Compton-Drake, J. Wang, R. R. Rydberg III, Washington State Univ. (USA)
- 6980 0F **Prediction of Sybil attack on WSN using Bayesian network and swarm intelligence** [6980-13]
R. Muraleedharan, X. Ye, L. A. Osadciw, Syracuse Univ. (USA)
- 6980 0G **Remote monitoring of soldier safety through body posture identification using wearable sensor networks** [6980-15]
S. Biswas, M. Quwaider, Michigan State Univ. (USA)

SESSION 5 WIRELESS NETWORKS

- 6980 0I **Asynchronous ad hoc network discovery for low-power systems** [6980-16]
T. W. Joslin, Harris Corp. (USA)
- 6980 0J **Multibeam antenna scheduling in ad hoc wireless networks** [6980-17]
X. Li, Y. Zhang, M. G. Amin, Villanova Univ. (USA)
- 6980 0K **Application of mesh network radios to UGS** [6980-18]
W. Calcutt, B. Jones, B. Roeder, McQ Inc. (USA)

SESSION 6 LOCALIZATION AND MULTIPATH

- 6980 0L **Uplink transmit beamforming design for SINR maximization with full multi-user channel state information** [6980-19]
S. Xi, M. D. Zoltowski, Purdue Univ. (USA)
- 6980 0M **Adaptive MIMO radar detection algorithm in a spatially correlated clutter environment** [6980-20]
W.-J. Chen, R. M. Narayanan, The Pennsylvania State Univ. (USA)
- 6980 0N **Realization and capacity analysis of cooperative communications based on multiplexing** [6980-21]
Y. Zhao, Western Michigan Univ. (USA)
- 6980 0O **Near-field MVDR source localization** [6980-22]
J. J. Handfield, Harris Corp. (USA); R. M. Rao, S. A. Dianat, Rochester Institute of Technology (USA)

- 6980 OP **An iterative maximum-likelihood-based parameter estimation algorithm for Nakagami-m distribution** [6980-23]
S. Dianat, R. Rao, Rochester Institute of Technology (USA)
- 6980 OQ **Finite mixture models for ultra-wideband channels** [6980-26]
D. Choudhary, A. Robinson, Univ. of Memphis (USA)

Author Index

Conference Committee

Symposium Chair

Larry B. Stotts, Defense Advanced Research Projects Agency (USA)

Symposium Cochair

Ray O. Johnson, Lockheed Martin Corporation (USA)

Program Track Chair

Raghuveer M. Rao, Rochester Institute of Technology (USA)

Conference Chairs

Sohail A. Dianat, Rochester Institute of Technology (USA)

Michael D. Zoltowski, Purdue University (USA)

Program Committee

Moeness G. Amin, Villanova University (USA)

Sirisha R. Medidi, Washington State University (USA)

John W. Nieto, Harris Corporation (USA)

Raghuveer M. Rao, Rochester Institute of Technology (USA)

Pramod K. Varshney, Syracuse University (USA)

Session Chairs

- 1 Diversity and Multicarrier Techniques
Fred C. Kellerman, Harris Corporation (USA)
- 2 Radio Frequency and Identification (RFID)
Yimin Zhang, Villanova University (USA)
- 3 Implementation and Application
Raghuveer M. Rao, Rochester Institute of Technology (USA)
- 4 Sensor Networks
John W. Nieto, Harris Corporation (USA)
- 5 Wireless Networks
Sohail A. Dianat, Rochester Institute of Technology (USA)
- 6 Localization and Multipath
Chad C. Lau, Purdue University (USA)
Muthanna Al-Mahmoud, Purdue University (USA)

