

# Contents

## **Volume 4708 Sensors, and Command, Control, Communications, and Intelligence (C3I) Technologies for Homeland Defense and Law Enforcement**

CYBERCRIMES AND CYBERTERRORISM  
FORENSIC SCIENCE: TECHNOLOGIES AND SYSTEMS  
CONCEALED WEAPONS AND THROUGH-THE-WALL SENSOR SYSTEMS  
ELECTRO-OPTICAL/INFRARED (EO/IR) AND RADAR SURVEILLANCE SENSORS  
BIOLOGICAL AND CHEMICAL AGENT SENSORS  
UNATTENDED GROUND SENSORS (UGS)  
ROBOTICS, MOBILE SENSORS, AND COUNTER-SNIPER TECHNOLOGIES  
COMMAND, CONTROL, COMMUNICATIONS, AND INTELLIGENCE SYSTEMS  
TAGGING, INTELLIGENCE EXPLOITATION, AND TRACKING TECHNOLOGIES

## **Volume 4709 Investigative Image Processing II**

VIDEO SURVEILLANCE  
IMAGE DATABASES  
IMAGE PROCESSING

## **Volume 4732 Photonic and Quantum Technologies for Aerospace and Applications**

ENABLING LASER TECHNOLOGY I  
ENABLING LASER TECHNOLOGY II  
ENABLING RF PHOTONIC TECHNOLOGY  
ENABLING PHOTONIC TECHNOLOGY  
QUANTUM COMPUTER REALIZATION AND DESIGN ISSUES  
QUANTUM CRYPTOGRAPHY AND QUANTUM INFORMATION PROCESSING  
POSTER SESSION

## **Volume 4733 Component and Systems Diagnostics,**

# Contents

## **Prognostics, and Health Management II**

PROGNOSTICS I  
TESTING AND TESTABILITY  
SYSTEMS AND ARCHITECTURE  
DIAGNOSTIC SYSTEMS  
LEARNING FROM DATA  
PROGNOSTICS II  
ADVANCED CONDITION MONITORING

## **Volume 4734 Optical Pattern Recognition XIII**

INVITED PAPERS ON APPLICATIONS  
INVITED PAPERS ON APPLICATIONS AND SLMS  
APPLICATIONS  
NEURAL NETWORKS AND APPLICATIONS  
POSTER SESSION

## **Volume 4735 Hybrid Image and Signal Processing VIII**

HYBRID IMAGE PROCESSING  
IMAGING SYSTEMS AND IMAGE COMPRESSION  
IMAGE PROCESSING ARCHITECTURES AND SYSTEMS  
APPLICATIONS  
POSTER SESSION

## **Volume 4736 Visual Information Processing XI**

CLASSIFICATION, REMOTE SENSING, AND OTHER APPLICATIONS  
INFORMATION THEORY, RESTORATION, AND RECONSTRUCTION  
IMAGE CODING AND COMPRESSION  
POSTER SESSION

## **Volume 4737 Holography: A Tribute to Yuri Denisyuk and Emmett Leith**

## **Volume 4738 Wavelet and Independent Component Analysis Applications IX**

REMOTE SENSING AND COMPRESSION

# Contents

WAVELET APPLICATIONS  
INTERNET SECURITY AND APPLICATIONS  
ICA REMOTE SENSING AND APPLICATIONS  
INVITED SESSION ON TIME-FREQUENCY REPRESENTATIONS  
RADAR PROCESSING  
WAVELET APPLICATIONS  
NOVEL APPLICATIONS  
POSTERS-THURSDAY

## **Volume 4739 Applications and Science of Computational Intelligence V**

OPTIMALITY  
COMPUTATIONAL INTELLIGENCE: IS IT REAL OR SMOKE AND MIRRORS?  
ART-BASED NEURAL NETWORKS  
THEORY  
APPLICATIONS  
POSTERS-TUESDAY

## **Volume 4740 Digital Wireless Communications IV**

MODULATION AND CODING  
WIRELESS MULTIPLE ACCESS  
EQUALIZATION AND CHANNEL MODELING  
APPLICATIONS  
NETWORKS  
SENSORS, ANTENNAS, AND PROPAGATION

## **Volume 4741 Battlespace Digitization and Network-Centric Warfare II**

KEYNOTE SESSION  
COMMUNICATIONS AND COMPUTING I  
COMMAND AND CONTROL SYSTEMS  
SPECIAL JOINT SESSION ON SMART SENSOR NETWORKS  
INTELLIGENCE, SURVEILLANCE, TARGET ACQUISITION AND

# Contents

RECONNAISSANCE  
GEO-SPATIAL IMAGE AND DATA EXPLOITATION DEVELOPMENTS AND  
APPLICATIONS I



# Volume 4708 Sensors, and Command, Control, Communications, and Intelligence (C3I) Technologies for Homeland Defense and Law Enforcement

## SESSION 4

### CYBERCRIMES AND CYBERTERRORISM

#### [Cryptographic wiretapping at 100 megabits \[4708-14\]](#)

C. Antonelli, K. Coffman, J. Fields, P. Honeyman

#### [Overview of covert communications through networks \[4708-15\]](#)

M. Caloyannides

#### [Active response technology \[4708-16\]](#)

L. Popyack, S. Taylor

#### [Forensic aspects of digital evidence: contributions and initiatives by the National Center for Forensic Science \[4708-17\]](#)

C. Whitcomb

#### [Early detection of Internet worm activity by metering ICMP destination unreachable messages \[4708-19\]](#)

G. Bakos, V. Berk

#### [Models of information security trend analysis \[4708-20\]](#)

T. Shimeall, P. Williams

#### [Evidence acquisition tools for cyber sex crimes investigations \[4708-21\]](#)

J. Novotny, A. Meehan, D. Schulte, G. Manes, S. Sheno

## SESSION 5

### FORENSIC SCIENCE: TECHNOLOGIES AND SYSTEMS

#### [Association of glass fragments by their trace elemental content using ICP-MS and LA-ICP-MS in the analysis scheme \[4708-26\]](#)

J. Almirall, S. Montero, K. Furton

#### [Investigative change detection: identifying new topics using lexicon-based search \[4708-27\]](#)

K. Hintz

#### [Multisource fusion for opportunistic detection and probabilistic assessment of homeland terrorist threats \[4708-30\]](#)

K. Laskey, T. Levitt

#### [Automated document analysis system \[4708-31\]](#)

J. Black, R. Dietzel, D. Hartnett

## SESSION 6

### CONCEALED WEAPONS AND THROUGH-THE-WALL SENSOR SYSTEMS

#### [Stepped-frequency CW radar for concealed weapon detection and through-the-wall surveillance](#)

A. Hunt, R. Hogg

#### [Ultrasonic through-the-wall surveillance system \[4708-34\]](#)

N. Wild, F. Doft, J. Wondra, S. Niederhaus, H. Lam

**Motion and ranging sensor system for through-the-wall surveillance system [4708-35]**

J. Black

**Handheld ultrasonic concealed weapon detector [4708-37]**

N. Wilde, S. Niederhaus, H. Lam, C. Lum

**Passive millimeter-wave imaging for concealed object detection [4708-38]**

S. Clark, J. Lovberg, C. Martin, J. Galliano

**Performance of shape descriptors applied to the recognition of weapons in CWD data [4708-39]**

M. Slamani, D. Ferris

**Detection and classification of concealed weapons using a magnetometer-based portal [4708-40]**

D. Kotter, L. Roybal, R. Polk

**Commercialization aspects of a MMW camera [4708-41]**

A. Pergande, L. Mirth, L. Anderson, P. Benson

**Evaluation of a MMW active through-the-wall surveillance system [4708-42]**

N. Currie, K. Stiefvater

**SESSION 7**

**ELECTRO-OPTICAL/INFRARED (EO/IR) AND RADAR SURVEILLANCE SENSORS**

**High-resolution full-panoramic imaging surveillance system [4708-45]**

G. Kerbyson

**Robust automatic camera pointing for airborne surveillance [4708-46]**

D. Dwyer, L. Wren, J. Thornton, N. Bonsor

**Advances in IR sensor for law enforcement [4708-48]**

G. Francisco

**Application of military uncooled infrared sensors to homeland defense [4708-52]**

C. Hornberger

**Tracking and imaging humans on heterogeneous infrared sensor arrays for law enforcement applications [4708-53]**

S. Feller, Y. Zheng, E. Cull, D. Brady

**SESSION 8**

**BIOLOGICAL AND CHEMICAL AGENT SENSORS**

**BioCapture: a handheld bioaerosol collector and concentrator [4708-57]**

A. Kamholz, E. Hanczyc

**Multisensor analyzer detector (MSAD) for low cost chemical and aerosol detection and pattern fusion [4708-58]**

D. Swanson, D. Merdes, D. Lysak, R. Curtis, D. Lang, A. Mazzara, N. Nicholas

**Genetically modified plants for law enforcement applications [4708-62]**

C. Stewart

**MicroSearch: human presence detection in vehicles [4708-63]**

T. Gamble, T. Cirillo

## SESSION 9

### UNATTENDED GROUND SENSORS (UGS)

#### **Physical security equipment for combating terrorism [4708-65]**

M. Toscano

#### **Remote sensing: special operations with unattended ground sensors -- perspectives and challenges [4708-66]**

P. Morgan

#### **Multimission unattended ground sensor for law enforcement applications [4708-68]**

G. Prado, G. Succi, J. Fitzgerald, D. Clapp, R. Gampert, P. Martel, T. Brennan

#### **Small power systems for law enforcement applications [4708-70]**

P. Sims, M. Mauk, O. Sulima

#### **Estimation of target range and orientation from video images for law enforcement applications [4708-71]**

A. Galaitsis

#### **Deployment-ready multimode micropower wireless sensor networks for intrusion detection, classification, and tracking [4708-73]**

M. Horton, A. Broad, M. Grimmer, K. Pister, S. Sastry, T. Rosenbury, N. Whitaker

## SESSION 10

### ROBOTICS, MOBILE SENSORS, AND COUNTER-SNIPER TECHNOLOGIES

#### **GIS-based UAV real-time path planning and navigation [4708-77]**

E. Levin, S. Kupiec, T. Forrester, T. DeBacker, T. Jansson

#### **Low-cost inflatable lighter-than-air surveillance system for civilian applications [4708-79]**

J. Kiddy, P. Chen, J. Niemczuk

#### **Urban gunshot and sniper location: technologies and demonstration results [4708-80]**

G. Lewis, S. Shaw, M. Crowe, C. Cranford, K. Torvik, P. Scharf, B. Stellingworth

## SESSION 11

### COMMAND, CONTROL, COMMUNICATIONS, AND INTELLIGENCE SYSTEMS

#### **Advanced consequence management program: challenges and recent real-world implementations [4708-82]**

T. Graser, K. Barber, B. Williams, F. Saghir, K. Henry

#### **Aspects of satellite imagery exploration in GIS-based command and control real-time technologies [4708-85]**

E. Levin, T. Jansson, A. Kostrzewski

#### **Acoustic monitoring of first responder's physiology for health and performance surveillance [4708-86]**

M. Scanlon

## SESSION 12

### TAGGING, INTELLIGENCE EXPLOITATION, AND TRACKING TECHNOLOGIES

#### **Two optical methods for vehicle tagging [4708-87]**

J. Coulter, C. Klein, J. Jafolla

**WLAN encryption based on local positioning systems [4708-89]**

S. Kupiec, W. Wang, T. Jansson

**Secure key management scheme for SDH-based all-optical networks [4708-90]**

J. Han, S. Lee, T. Nam, S. Sohn

**Command and control suite for small unit operations: the key to ground sensor transition [4708-92]**

S. Jarrett

**Advanced crisis response and consequence management: enabling a coordinated response [4708-95]**

R. Williams, J. Brush, M. Heinrich, J. Mantock, B. Jones, K. Henry



# Volume 4709 Investigative Image Processing II

## SESSION 2

### VIDEO SURVEILLANCE

#### [Automatic video analysis and compilation system AVACS \[4709-5\]](#)

R. Kemp

#### [Sampling theory for digital video acquisition: the guide for the perplexed user \[4709-20\]](#)

L. Rudin, P. Yu, J. Morel

#### [Use of gait parameters of persons in video surveillance systems \[4709-6\]](#)

Z. Geradts, M. Merlijn, G. de Groot, J. Bijhold

#### [Semi-automatic image segmentation and object tracking framework for investigative and surveillance-oriented applications \[4709-7\]](#)

P. De Smet, I. Bruyland

#### [CCD fingerprint method for digital still cameras \[4709-8\]](#)

N. Saitoh, K. Kurosawa, K. Kuroki, N. Akiba, Z. Geradts-DUPLICATE RECORD-DO NOT USE, J. Bijhold

#### [High-quality still images from video frame sequences \[4709-9\]](#)

T. Daubos, F. Murtagh

## SESSION 3

### IMAGE DATABASES

#### [Advancing the science of forensic data management \[4709-10\]](#)

T. Naughton

#### [Strategies for the automated recognition of marks in forensic science \[4709-11\]](#)

M. Heizmann

#### [Automated comparison of striation marks with the system GE/2 \[4709-12\]](#)

M. Heizmann

#### [Data mining in forensic image databases \[4709-13\]](#)

Z. Geradts, J. Bijhold

## SESSION 4

### IMAGE PROCESSING

#### [3D view on the crossing lines problem in document investigation \[4709-18\]](#)

V. Berx, J. De Kinder

#### [Forensic aspects of digital evidence: contributions and initiatives by the National Center for Forensic Science \(NCFS\) \[4709-19\]](#)

C. Whitcomb

#### [Diffraction image method to measure shape distribution function of micrometer particles \[4709-16\]](#)

Y. Wang

# Volume 4732 Photonic and Quantum Technologies for Aerospace and Applications

## SESSION 1

### ENABLING LASER TECHNOLOGY I

[Angled grating high-power semiconductor lasers: simulation of beam characteristics under thermal effects \[4732-1\]](#)

A. Sarangan

[Nd-doped fiber laser \[4732-2\]](#)

Q. Wang, N. Dutta

[Long-wavelength lasers using GaAs-based quantum dots \[4732-3\]](#)

N. Ledentsov, V. Shchukin

## SESSION 2

### ENABLING LASER TECHNOLOGY II

[Fiber laser modelocked by nonlinear polarization rotation in a fiber loop \[4732-4\]](#)

E. Kuzin, B. Ibarra-Escamilla, D. Gomez-Garcia, J. Haus

[Comparison of fundamental and harmonic modelocking of a 10-GHz external cavity semiconductor laser \[4732-5\]](#)

T. Yilmaz, C. DePriest, P. Delfyett, J. Abeles, A. Braun

[Short pulse generation near 1.55-um wavelength \[4732-6\]](#)

H. Chen, G. Zhu, C. Colpitts, N. Dutta

## SESSION 3

### ENABLING RF PHOTONIC TECHNOLOGY

[Contrast ratio enhancement in a saturable absorber-based photonic analog-to-digital converter \[4732-7\]](#)

M. Hayduk, R. Bussjager, S. Johns, C. Gerhardstein, G. Wicks

[10 GSPS 10-bit optical analog-to-digital converter \[4732-8\]](#)

E. Donkor, J. Green, M. Hayduk, R. Bussjager

## SESSION 4

### ENABLING PHOTONIC TECHNOLOGY

[Bandwidth characteristics for the stepped conical-zoned antenna \[4732-10\]](#)

J. Wiltse

[Photonic packaging for space applications \[4732-11\]](#)

J. Parkerson, C. Chalfant, F. Orlando, T. Hull

[Characterization of a 12-channel optical fiber ribbon cable with MTP array connector assembly for space flight environments \[4732-12\]](#)

M. Ott, S. Macmurphy, P. Friedberg

[Development of holographic optical elements based on LiNbO3 photorefractive crystals and As-S-Se chalcogenide films \[4732-30\]](#)

N. Kukhtarev, T. Kukhtareva, V. Edwards, J. Wang, V. Rotaru, O. Korshak, I. Ciapurin

## SESSION 5

### QUANTUM COMPUTER REALIZATION AND DESIGN ISSUES

#### **Quantum algorithms [4732-14]**

B. Segev

#### **Control of a superconducting qubit in the presence of a nonlinear backreaction [4732-15]**

J. Ralph, T. Clark, M. Everitt, P. Steiffell, R. Prance, H. Prance

#### **Implementing qubits in an entangled Bose-Einstein condensate [4732-16]**

M. Brown

#### **Prospects and challenges for the realization of quantum computers [4732-18]**

E. Donkor, P. Kumavor

## SESSION 6

### QUANTUM CRYPTOGRAPHY AND QUANTUM INFORMATION PROCESSING

#### **Conditional optimization in the four-state protocol of quantum cryptography [4732-19]**

H. Brandt

#### **Embedding of feature space for pattern recognition using quantum computing [4732-20]**

T. Hattori, O. Matoba, B. Javidi

#### **Image recognition based on optical quasi-quantum computing [4732-21]**

T. Hattori, O. Matoba, B. Javidi

## SESSION 8

### POSTER SESSION

#### **Primary design of the data storage unit used in the Space Solar Telescope [4732-27]**

F. Wang, B. Wang, C. Sun

#### **Family of new operations equivalency of neuro-fuzzy logic: optoelectronic realization and applications [4732-28]**

V. Krasilenko, A. Nikolsky, V. Yatskovsky, K. Ogorodnik, S. Lischenko

#### **Photothermoplastic-based recording equipment: new features of airborne and satellite imaging**

V. Rotaru, I. Ciapurin, O. Korshak

# Volume 4733 Component and Systems Diagnostics, Prognostics, and Health Management II

## SESSION 1

### PROGNOSTICS I

[Multimode damage tracking and failure prognosis in electromechanical systems \[4733-1\]](#)

D. Chelidze

[Preliminary architecture for the predictive failures and advanced diagnostics program \[4733-2\]](#)

B. Gilmartin, J. Castrigno, G. Rovnack, J. Bala, P. Faas, K. Eizenga

## SESSION 2

### TESTING AND TESTABILITY

[System health tracking and safe testing \[4733-5\]](#)

A. Bos, A. van Gemund, J. Zutt

## SESSION 3

### SYSTEMS AND ARCHITECTURE

[Integration of health management and support systems is key to achieving cost reduction and operational concept goals of the 2nd generation reusable launch vehicle \[4733-9\]](#)

P. Koon, S. Greene

[NASA integrated vehicle health management technology experiment for X-37 \[4733-10\]](#)

M. Schwabacher, J. Samuels, L. Brownston

[Data mining of aviation data for advancing health management \[4733-13\]](#)

A. Mathur

## SESSION 4

### DIAGNOSTIC SYSTEMS

[Application of diagnostic system based on dynamic scene identification \[4733-16\]](#)

A. Timofiejczuk

## SESSION 5

### LEARNING FROM DATA

[Classification performance results of various medical diagnostic data sets \[4733-17\]](#)

R. Lynch, P. Willett

[Classifier performance measures in multifault diagnosis for aircraft engines \[4733-18\]](#)

W. Yan, K. Goebel, J. Li

[Combined numerical and linguistic knowledge representation and its application to medical diagnosis \[4733-19\]](#)

P. Meesad, G. Yen

[Methods of detection of changes of complex machinery states \[4733-20\]](#)

A. Timofiejczuk

**SESSION 6**  
**PROGNOSTICS II**

**Physically based diagnosis and prognosis of cracked rotor shafts [4733-21]**

C. Oppenheimer, K. Loparo

**Condition-based predictive maintenance of industrial power systems [4733-22]**

M. Azam, F. Tu, K. Pattipati

**Useful lifetime tracking via the IMM [4733-23]**

E. Phelps, P. Willett, T. Kirubarajan

**Toward dynamic model-based prognostics for transmission gears [4733-24]**

W. Wang

**SESSION 7**  
**ADVANCED CONDITION MONITORING**

**Multiple fault diagnosis in graph-based systems [4733-25]**

F. Tu, K. Pattipati, S. Deb, V. Malepati

**Nonlinear damage models for diagnosis and prognosis in structural dynamic systems [4733-26]**

D. Adams

**Diagnostics of a complex delayed system by numerical approaches [4733-28]**

V. Dailyudenko

**Methodology of declarative and procedural knowledge acquisition for machinery diagnostics [4733-29]**

W. Moczulski

# Volume 4734 Optical Pattern Recognition XIII

## SESSION 1

### INVITED PAPERS ON APPLICATIONS

**Unconstrained eigen-filter pairs for SAR detection [4734-1]**

R. Shenoy, D. Casasent

**Compact 512 x 512 grayscale optical correlator [4734-2]**

T. Chao, H. Zhou, G. Reyes

**New phase contrast methods for optical processing [4734-3]**

J. Glueckstad, P. Mogensen, R. Eriksen

## SESSION 2

### INVITED PAPERS ON APPLICATIONS AND SLMS

**Face recognition through pose estimation and fringe-adjusted joint transform correlation [4734-4]**

A. Alsamman, M. Alam

**Advances in liquid crystal spatial light modulators [4734-5]**

K. Bauchert, S. Serati, A. Furman

**In-situ characterization of a correlator's filter SLM [4734-6]**

R. Juday, S. Monroe, J. Rollins

## SESSION 3

### APPLICATIONS

**Incoherent correlator system for satellite orientation control [4734-7]**

A. Kouris, R. Young, C. Chatwin, P. Birch

**Low-light level recognition using COTS optical correlator [4734-8]**

A. Bergeron

**Comparison of the performance of 2-f versus 4-f correlators with limited coding domain SLM [4734-9]**

D. Selberg, B. Noharet, K. Brunnstroem

**Binary phase-based optical encryption system using interferometer [4734-10]**

D. Seo, C. Shin, J. Kim, C. Kim, J. Kim, S. Kim

**Ladar image recognition using synthetically derived discrete phase-amplitude filters in an optical correlator [4734-11]**

D. Calloway, D. Goldstein

**Multipurpose mean-square-error filter for processing obscured images [4734-12]**

J. Khoury, P. Gianino, C. Woods

## SESSION 4

### NEURAL NETWORKS AND APPLICATIONS

**Spacecraft navigation using a grayscale optical correlator [4734-13]**

T. Chao, H. Zhou, G. Reyes

**Class-associative multiple-target detection using fringe-adjusted joint transform correlation [4734-14]**

M. Alam, M. Rahman

**Correlators for rank order shape similarity measurement [4734-15]**

J. Gregga, G. Power, K. Iftexharuddin

**Optical music recognition using skeleton structure and neural network [4734-16]**

S. Chang, S. Soak, T. Shin, B. Ahn

**Properties of feedback neural networks studied from discrete algebra and N-dimension geometry**

C. Hu

**Different weighting approaches for performing heterogeneous correlation [4734-18]**

J. Khoury, P. Gianino, C. Woods

## **SESSION 5**

### **POSTER SESSION**

**Imaging objects in an opaque scattering medium [4734-19]**

J. Khoury, J. Kane, P. Gianino, P. Hemmer, C. Woods

**Music recognition system using ART-1 and GA [4734-20]**

S. Soak, S. Chang, T. Shin, B. Ahn

**Extreme patterns in noniterative learning studied from N-dimension geometry [4734-21]**

C. Hu

**New type of compact optical correlator with noise resistance [4734-22]**

Y. Hao, W. Liu, S. Lu, J. Wang, Y. Zhang

# Volume 4735 Hybrid Image and Signal Processing VIII

## SESSION 1

### HYBRID IMAGE PROCESSING

#### [Fast watershed aided by target detection \[4735-1\]](#)

H. Lin, J. Si, G. Abousleman

#### [Segmentation of MPEG-2 motion imagery within the compressed domain \[4735-2\]](#)

T. Heath, M. Robertson, J. Keller, T. Howlett

#### [Pose estimation for autonomous robotic grasping \[4735-3\]](#)

S. Monroe, J. Rollins, R. Juday

#### [New filters for optical correlators \[4735-4\]](#)

N. Evtikhiev, P. Ivanov, A. Kamensky, R. Starikov

## SESSION 2

### IMAGING SYSTEMS AND IMAGE COMPRESSION

#### [High-dynamic-range imaging optical detectors \[4735-6\]](#)

R. Coutinho, D. Selviah, H. Griffiths

#### [Region-based scalable coding for interactive image/video communications over networks \[4735-7\]](#)

J. Lee, G. Lee, S. Yoon

## SESSION 3

### IMAGE PROCESSING ARCHITECTURES AND SYSTEMS

#### [Hybrid image recognition architecture \[4735-11\]](#)

C. Delrieux, R. Katz

#### [Image processing spreadsheet \[4735-13\]](#)

C. Delrieux, G. Ramoscelli, L. Arlenghi, A. Vitale

## SESSION 4

### APPLICATIONS

#### [Dynamic programming-based approach to microarray image registration \[4735-14\]](#)

S. Rodrigues, R. Stanley, C. Caldwell, P. Gader

## SESSION 5

### POSTER SESSION

#### [Multiview 3D display system based on volume holographic lenticular element \[4735-5\]](#)

B. Cho, S. Lee, J. Gu, E. Kim

#### [Convergence control of a moving object using hierarchical algorithms in a stereo vision system](#)

J. Ko, J. Lee, E. Kim

#### [Detection of sample parameters in secondary electron microscope images: test results \[4735-19\]](#)

S. Mahadevan, D. Casasent



# Volume 4736 Visual Information Processing XI

## SESSION 1

### CLASSIFICATION, REMOTE SENSING, AND OTHER APPLICATIONS

**Object recognition in a digital image [4736-2]**

T. Donovan

**Objective quality measures assessment [4736-3]**

J. Leachtenauer

**Vision-enhanced formulation of signal-to-noise ratio for imaging systems [4736-4]**

G. Power

**Statistics of visual representation [4736-5]**

D. Jobson, Z. Rahman, G. Woodell

**Multisensor fusion and enhancement using the Retinex image enhancement algorithm [4736-6]**

Z. Rahman, D. Jobson, G. Woodell, G. Hines

**Latent and apparent image quality metrics [4736-7]**

K. Miettinen

**Genetic algorithm for texture description and classification [4736-8]**

V. Manian, R. Vasquez

## SESSION 2

### INFORMATION THEORY, RESTORATION, AND RECONSTRUCTION

**Display optimization for visual information processing of continuous tone imagery [4736-9]**

J. Leachtenauer

**Application of Shannon Information in image postprocessing [4736-35]**

D. Hope, S. Prasad

**Hyperspectral information efficiency and pattern classification [4736-10]**

S. Reichenbach, R. Narayanan

**Aliasing in remote sensing imagery [4736-11]**

R. Schowengerdt

**Experimental investigation of aliasing in the assessment of sampled images [4736-12]**

J. van der Gracht, G. Euliss, V. Pauca

**Design of a diffractive anti-aliasing filter using information density [4736-13]**

J. Mait, J. van der Gracht, G. Euliss

## SESSION 3

### IMAGE CODING AND COMPRESSION

**Modeling of wavefront-coded imaging systems [4736-14]**

E. Dowski, K. Kubala

**Innovative framework for 3D wavelet video streaming [4736-15]**

J. Dong, Y. Zheng

**XML-based for MPEG-4 video representation, streaming, and error resilience [4736-16]**

X. Sun, Z. Shi, C. Kuo

**Adaptable recursive binary entropy coding technique [4736-17]**

A. Kiely, M. Klimesh

**Error-resilient intelligent compression of SAR imagery [4736-18]**

R. Bonneau, G. Abousleman

## **SESSION 4**

### **POSTER SESSION**

**Data hiding method in adaptive lossless coding scheme [4736-20]**

S. Kato, M. Hasegawa

**Optical image processing using phase reversal Twyman-Green interferometer [4736-22]**

V. Venkateswara Rao, N. Krishna Mohan

**Multispectral image sharpening using a shift-invariant wavelet transform and adaptive processing of multiresolution edges [4736-23]**

G. Lemeshevsky

**Dynamic load balancing and content update for media storage servers [4736-27]**

Y. Zhao, Z. Shi, C. Kuo

**Image order statistics filtering procedures in presence of complex noise [4736-30]**

V. Ponomaryov, F. Gallegos Funes, L. Nino de Rivera

**Implementation of object-based multiview 3D display using adaptive disparity-based segmentation [4736-31]**

K. Bae, S. Lim, E. Kim

**New approach for three-dimensional object tracking and display system [4736-32]**

S. Lim, K. Bae, E. Kim

**Implementation of multiview stereoscopic images based on adaptive object segmentation [4736-33]**

J. Lee, K. Bae, E. Kim

# Volume 4737 Holography: A Tribute to Yuri Denisyuk and Emmett Leith

## SESSION 1

### [Generalization of the theory of holographic coherence confocal imaging \[4737-1\]](#)

E. Leith, K. Mills, W. Chien, B. Athey, D. Dilworth

### [Holographic imaging properties of standing and traveling waves of intensity of fields of light scattered by objects \[4737-2\]](#)

Y. Denisyuk

### [Holography reinvented \[4737-3\]](#)

S. Benton

### [Coherence functions in optical imaging \[4737-4\]](#)

W. Rhodes

### [Solar holography \[4737-5\]](#)

J. Ludman, J. Riccobono, H. Caulfield, T. Upton

### [Holographic techniques for recording ultrafast events \[4737-6\]](#)

M. Centurion, Z. Liu, G. Steckman, G. Panotopoulos, J. Hong, D. Psaltis

## SESSION 2

### [Nonlinear optical information processing with femtosecond pulses \[4737-7\]](#)

D. Panasenko, R. Rokitski, D. Marom, Y. Mazurenko, P. Sun, N. Alic, Y. Fainman

### [New look at volume holography \[4737-8\]](#)

J. Shamir, K. Wagner

### [Holography and the Wigner function \[4737-9\]](#)

A. Lohmann, M. Testorf, J. Ojeda-Castaneda

### [Appearance of conical sections \[4737-11\]](#)

N. Abramson, B. Bonnevier, J. Boman

### [White light interferometry \[4737-12\]](#)

J. Wyant

## SESSION 3

### [Grating waveguide structures and their application \[4737-13\]](#)

A. Friesem, N. Dudovich, T. Katchalski, G. Levy-Yurista

### [From 3D holography to modern lasers \[4737-15\]](#)

G. Pasmanik

### [Holographic brain: a good analogy gone bad \[4737-17\]](#)

H. Caulfield

## SESSION 4

### [Super-realistic imaging based on color holography and Lippmann photography \[4737-20\]](#)

H. Bjelkhagen

### [Display applications of large-scale digital holography \[4737-21\]](#)

M. Klug

# Volume 4738 Wavelet and Independent Component Analysis Applications IX

## SESSION 1

### REMOTE SENSING AND COMPRESSION

[2D empirical mode decompositions in the spirit of image compression \[4738-8\]](#)

A. Linderhed

[Wavelet packet decompositions of texture images: analysis of cost functions, filter influences, and image models \[4738-9\]](#)

A. Linderhed

[Wavelet multiscale feature detection applied to foliage penetration in Landsat images \[4738-10\]](#)

K. Jones

[Spectral BRDF modeling using wavelets \[4738-11\]](#)

L. Claustres, Y. Boucher, M. Paulin

[Multiresolution registration of remote sensing images using stochastic gradient \[4738-12\]](#)

A. Cole-Rhodes, K. Johnson, J. Le Moigne

[Spectral data reduction via wavelet decomposition \[4738-14\]](#)

S. Kaewpijit, J. Le Moigne, T. El-Ghazawi

## SESSION 2

### WAVELET APPLICATIONS

[Wavelet-based communication channel modeling and identification \[4738-15\]](#)

M. Doroslovacki, L. Stankovic

[Modeling variable-bit-rate video traffic using linear scale-invariant systems \[4738-16\]](#)

R. Narasimha, R. Rao

[Scalable software architecture for high-speed color document compression based on JPEG2000: VI \[4738-17\]](#)

M. Thierschmann, U. Martin

[Matched low-pass filter design for orthogonal IIR filter banks \[4738-18\]](#)

L. Wilkinson, A. Bopardikar, R. Rao, H. Szu

[Asymptotic Cramer-Rao bounds for Morlet wavelet filter bank transforms of FM signals \[4738-20\]](#)

R. Scheper

## SESSION 3

### INTERNET SECURITY AND APPLICATIONS

[Digital watermarking methods of still images using the wavelet transform \[4738-1\]](#)

P. Thitimajshima

[Digital watermarking method using vector set of wavelet coefficients \[4738-2\]](#)

M. Hasegawa, S. Kato

[Biometric verification in dynamic writing \[4738-3\]](#)

S. George

**Object classification with multiresolution wavelet decomposition [4738-4]**

M. Leo, A. Branca, G. Attolico, A. Distante

**Combinatorial analysis of network security [4738-5]**

S. Noel, B. O'Berry, C. Hutchinson, S. Jajodia, L. Keuthan, A. Nguyen

**Optical Internet security [4738-6]**

L. Keuthan, J. Sanghera, I. Aggarwal

**Progress in wavelet algorithms and applications [4738-7]**

M. Wickerhauser

**SESSION 5**

**ICA REMOTE SENSING AND APPLICATIONS**

**Fast LCNN ICA for unsupervised hyperspectral image classifier [4738-55]**

I. Kopriva, H. Szu

**Lagrange constraint neural network for fully constrained subpixel classification in hyperspectral imagery [4738-56]**

H. Ren, H. Szu, J. Buss

**Power-line communication testbed through underdetermined blind source separation [4738-46]**

P. Chanyagorn, I. Kopriva, H. Szu

**Lagrange constraint neural network for audio varying BSS [4738-58]**

H. Szu, C. Hsu

**SESSION 6**

**INVITED SESSION ON TIME-FREQUENCY REPRESENTATIONS**

**Joint time-frequency analysis of over-the-horizon radar data [4738-21]**

B. Root

**Moving-target detection in over-the-horizon radar using adaptive chirplet transform [4738-22]**

G. Wang, X. Xia, B. Root, V. Chen

**Applications of rotational time-frequency transforms to radar imaging of moving targets [4738-23]**

V. Chen

**Radon transforms and time-frequency representations for ISAR motion compensation and imaging [4738-24]**

P. Steeghs, L. Kester, S. Gelsema

**SESSION 7**

**RADAR PROCESSING**

**Radar imaging: a "natural" wavelet application? [4738-25]**

L. Vignaud

**Comparison of quadratic time-frequency methods applied to ISAR imaging of aircraft [4738-26]**

T. Sparr

**Distortion in radar images: numerical and experimental studies [4738-27]**

S. Wong, G. Duff, E. Riseborough

**Target recognition based on the moment functions of radar signatures [4738-28]**

K. Kim, H. Kim

**Integrated speckle reduction and edge detection of SAR images using overcomplete wavelet decomposition [4738-29]**

P. Thitimajshima

## **SESSION 8**

### **WAVELET APPLICATIONS**

**New way to search for the best base in wavelet packets [4738-30]**

H. Chen, T. Olson

**Theory and application of triplet-valued wavelets [4738-31]**

V. Labounets, A. Maidan, E. Labunets-Rundblad, J. Astola

**Fast invariant recognition for color 3D images based on Hurwitzon-valued moments and invariants [4738-32]**

V. Labounets, E. Labunets-Rundblad, J. Astola

**Implementation of reduced-complexity high-performance programmable wavelet FIR filters using field-programmable logic [4738-33]**

J. Ramirez, U. Meyer-Baese

**Time-frequency representations applied to canonical Newtonian gradient forms: I [4738-34]**

D. Hughes

**Physical wavelets: applications in optics [4738-35]**

S. Deschenes, Y. Sheng

## **SESSION 9**

### **NOVEL APPLICATIONS**

**Classification of similar medical images in the lifting domain [4738-36]**

C. Sallee, R. Tashakkori

**Effect of scanning of medical images on the performance of lifting [4738-37]**

R. Tashakkori, J. Tyler, X. Qi, C. Sallee

**Compression of EEG multichannel signal using wavelets [4738-38]**

V. Ponomaryov, L. Badillo, C. Juarez, J. Sanchez, L. Igartua, J. Sanchez Garcia

**Wavelet-based model matching for FM denoising [4738-39]**

A. Teolis, R. Scheper

**Two-dimensional Zernike wavelets for one-dimensional complex signal identification [4738-40]**

A. Teolis

**Lagrange constraint neural networks for massive pixel parallel image demixing [4738-52]**

H. Szu, C. Hsu

**Image and audio wavelet integration for home security video compression [4738-60]**

Y. Cheng, G. Huang

## SESSION 10

### POSTERS-THURSDAY

**Solid rocket near-field noise in static experiment: wavelet analysis [4738-42]**

Q. Xu, G. Liao

**Analysis on optical dome in wider waveband [4738-43]**

H. Zhou

**Spatial model of lifting scheme in wavelet transforms and image compression [4738-44]**

Y. Wu, G. Li, G. Wang

**Video via radio testbed [4738-48]**

H. Szu, C. Hsu

**Wavelet-based region indexing for advanced content-based image retrieval systems [4738-49]**

M. Ameen

**Wavelets for ultrasonic echo identification in aircraft fuel tanks [4738-61]**

M. Sadok

# Volume 4739 Applications and Science of Computational Intelligence V

## SESSION 1

### OPTIMALITY

[Results on a fractal measure for evolutionary optimization \[4739-1\]](#)

P. Angeline

[Genetic routing algorithms to optimize availability in broadband wireless networks with load balancing \[4739-2\]](#)

W. Hortos

[Evolutionary programming for goal-driven dynamic planning \[4739-3\]](#)

J. Vaccaro, C. Guest, D. Ross

[Reinforcement learning and design of nonparametric sequential decision networks \[4739-4\]](#)

E. Ertin, K. Priddy

[Evolutionary algorithm in group theory \[4739-5\]](#)

L. Wang, P. Angeline

## SESSION 2

### COMPUTATIONAL INTELLIGENCE: IS IT REAL OR SMOKE AND MIRRORS?

[Computational intelligence: Is it real or smoke and mirrors? \[4739-6\]](#)

K. Priddy

## SESSION 3

### ART-BASED NEURAL NETWORKS

[Ellipsoid ART/ARTMAP category regions for the choice-by-difference category choice function \[4739-7\]](#)

G. Anagnostopoulos, M. Georgiopoulos

[Boosted ellipsoid ARTMAP \[4739-8\]](#)

G. Anagnostopoulos, M. Georgiopoulos, S. Verzi, G. Heileman

[Fuzzy ART and Fuzzy ARTMAP with adaptively weighted distances \[4739-9\]](#)

D. Charalampidis, G. Anagnostopoulos, M. Georgiopoulos, T. Kasparis

## SESSION 4

### THEORY

[Interdependencies in data preprocessing, training methods, and neural network topology generation \[4739-10\]](#)

S. Rudolph, S. Brueckner

[Adaptive constructive neural networks using Hermite polynomials for compression of still and moving images \[4739-11\]](#)

L. Ma, K. Khorasani, M. Azimi-Sadjadi

[Confusion-based fusion of classifiers \[4739-13\]](#)

M. Oxley, A. Magnus



**Quantifying the expertise of classifiers using 4-value logic [4739-14]**

A. Magnus, M. Oxley

**Adaptable multiple neural networks using evolutionary computation [4739-15]**

S. Sohn, C. Dagli

## **SESSION 5**

### **APPLICATIONS**

**Fast tree-structured vector quantization method for medical image compression [4739-16]**

A. Meyer-Baese, U. Meyer-Baese

**Neural self-adapting architecture for video-on-radio devices [4739-17]**

G. Basti, A. Perrone

**Security encryption for video-on-radio devices [4739-18]**

A. Perrone, G. Basti

**ROI and neural linear network technique applied to help in the analysis of skin cancer using vision [4739-19]**

M. Vazquez Rueda, T. Cervantes Medrano, L. Vazquez Rueda

**Automatic frog call monitoring system: a machine learning approach [4739-28]**

G. Yen, Q. Fu

**Parameter whitening method for neural network modeling for gray problem [4739-22]**

L. Zhong, J. Yuan, C. Zou

## **SESSION 6**

### **POSTERS-TUESDAY**

**FNN-based hyper-cylinder cluster and its application in the control of nonlinear systems [4739-25]**

K. An, S. Liu, T. Zhao, H. Chen

**Copyright protection of images using human visual masking on DCT-based watermarking [4739-26]**

Y. Rangsanseri, P. Thitimajshima

**Hiding binary logo with DCT-based digital watermarking [4739-27]**

P. Thitimajshima, Y. Thitimajshima, Y. Rangsanseri

# Volume 4740 Digital Wireless Communications IV

## SESSION 1

### MODULATION AND CODING

**Wavelet packet modulation: solving the synchronization problem [4740-1]**

E. Kjeldsen, A. Lindsey, R. Schwartz

**Low-density parity check codes using OFDM on multipath fading channel [4740-3]**

F. Kellerman, S. Dianat

## SESSION 2

### WIRELESS MULTIPLE ACCESS

**Novel power control scheme for packet-switched W-CDMA systems [4740-4]**

M. Chang, C. Kim, C. Kuo

**Probabilistic microcell prediction model [4740-5]**

S. Kim

**Performance evaluation of data transmission over multicarrier CDMA systems [4740-7]**

F. Chen, C. Hwang, C. Kim, C. Kuo

**Error-resilient design of high-fidelity scalable audio coding [4740-8]**

D. Yang, H. Ai, C. Kyriakakis, C. Kuo

**Suppression of digital communication interference sources in GPS [4740-9]**

L. He, M. Amin, A. Lindsey

**Nonstationary interference suppression in spread spectrum communication systems [4740-10]**

M. Amin

## SESSION 3

### EQUALIZATION AND CHANNEL MODELING

**Symbol rate estimation with multipath propagation with application to digital TV [4740-11]**

M. Zoltowski, M. Breinholt, M. Fimoff

**Conjugate-gradient-based decision feedback equalization with structured channel estimation for digital Television [4740-12]**

M. Zoltowski, W. Hillery, S. Ozen, M. Fimoff

**Performance comparison of dual and combined mode adaptive techniques for dynamic channel equalizations [4740-13]**

L. He, M. Amin

## SESSION 4

### APPLICATIONS

**Survey on advanced personal portable communication systems [4740-14]**

H. Zhu, L. Boucher

**Mobile health systems: a brief overview [4740-25]**

S. Voskarides, C. Pattichis, R. Habib Istepanian, E. Kyriacou, M. Pattichis, C. Schizas

**RF/photonic antenna for high-capacity wireless communications [4740-26]**

M. Khodier, C. Christodoulou, G. Tzeremes, P. Yu

**Adaptive recovery protocols for multilayer ad-hoc networks in theater of nonuniform failure rate**

W. Cui, M. Bassiouni

**Power control algorithms in wireless communications [4740-28]**

J. Rohwer, C. Abdallah, A. El-Osery

**Investigations on polarization schemes for use in wireless environments [4740-29]**

M. Kar, P. Wahid

**SESSION 5**

**NETWORKS**

**Throughput estimation of users in GPRS networks based on packet data traffic modeling [4740-17]**

K. Kim, F. Liu, C. Kuo

**Kernel-based LSI system model for synthesizing self-similar network traffic traces [4740-19]**

S. Lee, R. Rao

**Fuzzy system for adaptive network routing [4740-20]**

A. Pasupuleti, A. Mathew, N. Shenoy, S. Dianat

**SESSION 6**

**SENSORS, ANTENNAS, AND PROPAGATION**

**Capacity efficiencies of time slot allocation schemes for adaptive antenna systems [4740-21]**

G. Okamoto, C. Chen

**Pseudo full-duplex phased array antennas [4740-22]**

J. Foshee, R. Tahim, K. Chang

**Ultra-wide band signal analysis in urban environment [4740-23]**

G. Schiavone, R. Palaniappan, J. Tracy, P. Wahid, T. Dere

**Amplitude and phase optimization for adaptive antenna arrays via spatially smoothed ESPRIT [4740-24]**

F. Tseng, J. Venkataraman

# Volume 4741 Battlespace Digitization and Network-Centric Warfare II

## SESSION 1

### KEYNOTE SESSION

#### [ISTAR concept experimentation for Canada's future army \[4741-3\]](#)

G. Clairoux, M. Gareau, G. Thibault, G. Vezina, R. Walker

## SESSION 2

### COMMUNICATIONS AND COMPUTING I

#### [FCS communications technology for the objective force \[4741-4\]](#)

P. Sass, J. Freebersyser

#### [Networked sensor communications for the objective force \[4741-5\]](#)

J. Nemeroff, L. Garcia, D. Hampel, S. Di Pierro

#### [Recent advances in the design of distributed embedded systems \[4741-6\]](#)

J. Bay

#### [Information hiding technique \[4741-7\]](#)

M. Younger, P. Budulas, S. Young

#### [Using OpenSSH to secure mobile LAN network traffic \[4741-8\]](#)

B. Luu, R. Gopaul

#### [Indirect networked target-enhanced robust video-interaction telepresence \[4741-10\]](#)

A. Kostrzewski, W. Wang, D. Kang, B. Sun, C. Lee, J. Kim, K. Kolesnikov, T. Jansson

#### [Network data routing in dynamic environments of potentially mobile nodes \[4741-11\]](#)

J. Impson, J. Moody, N. Mehravari

## SESSION 3

### COMMAND AND CONTROL SYSTEMS

#### [NATO initial common operational picture capability project \[4741-13\]](#)

L. Fanti, D. Beach

#### [Lessons from UK Digitization research \[4741-14\]](#)

E. Ross

#### [Service-based architectures for the network-centric battlefield \[4741-15\]](#)

P. Vessels

#### [Autonomous self-organizing resource manager for multiple networked platforms \[4741-17\]](#)

J. Smith

#### [New computer and communications environments for light armored vehicles \[4741-18\]](#)

J. Rapanotti, M. Palmarini, M. Dumont

#### [Optimization of armored fighting vehicle crew performance in a net-centric battlefield \[4741-19\]](#)

W. McKeen, M. Espenant

## SESSION 4

### SPECIAL JOINT SESSION ON SMART SENSOR NETWORKS

**Measured results of an efficient broadband HF antenna system for reliable all-terrain communication between unattended ground sensors [4741-22]**

J. Pedersen, J. Chabra

**Target location by self-organizing autonomous air vehicles [4741-23]**

K. Brown, R. Bowyer, D. Koks

**Smart Sensor Web: experiment**

E. Bjorkman, J. Mackin, A. Sciarretta

**Target localization using acoustic time-difference of arrival in distributed sensor networks [4741-25]**

P. Boettcher, J. Sherman, G. Shaw

**Cooperative sensor networks with bandwidth constraints [4741-26]**

L. Sciacca, R. Evans

**Distributed data fusion over an ad hoc network [4741-27]**

S. Anderson, L. Binns, P. Collins, A. Cooke, P. Greenway, D. Valachis

## SESSION 5

### INTELLIGENCE, SURVEILLANCE, TARGET ACQUISITION AND RECONNAISSANCE

**Immersive remote monitoring of urban sites [4741-30]**

R. Kumar, H. Sawhney, A. Arpa, S. Samarasekera, M. Aggrawal, S. Hsu, D. Nister, K. Hanna

**Network-centric data fusion [4741-31]**

D. Nicholson, C. Lloyd, P. Collins

**Automatic aircraft recognition [4741-33]**

H. Hmam, J. Kim

**Three-dimensional compression of mesoscale meteorological data based on JPEG 2000 [4741-34]**

S. Cabrera

**Detecting buried mines in ground penetrating radar using a Hough transform approach [4741-35]**

M. Carlotto

**Rapid area coverage for unexploded ordnance using UAVs incorporating magnetic sensors [4741-36]**

A. Perry, P. Czipott, D. Walsh

## SESSION 6

### GEO-SPATIAL IMAGE AND DATA EXPLOITATION DEVELOPMENTS AND APPLICATIONS I

**Remote sensing support for the World Trade Center recovery effort [4741-37]**

W. Roper

**Real-time geo-spatial registration of target images from the WAR HORSE sensor [4741-38]**

W. Kendall

**Linear feature detection using multiresolution wavelet filters [4741-39]**

S. Kozaitis, S. Udomhunsakul, R. Cofer, A. Agarawal, S. Song

**Statistical modeling for improved land cover classification [4741-40]**

Y. Zhao, X. Zhou, K. Palaniappan, X. Zhuang

**Error analysis of image matching using a non-planar object model [4741-42]**

W. Bell, V. Devarajan

**Dynamic visualization of urban terrain: movement to navigation in 4D virtual worlds [4741-44]**

J. Harrison, D. Kliman, W. Roper

**Video imagery applications for intelligent home condition assessment [4741-45]**

G. Richa, W. Roper

**New method of feature extraction in polarimetric SAR image classification [4741-47]**

J. Xu, J. Yang, Y. Peng

**Natural and artificial target recognition by hyperspectral remote sensing data [4741-48]**

B. Zhang, L. Liu, Y. Zhao, G. Xu, L. Zheng, Q. Tong

**Target independent algorithms for description and structural matching of aerospace photographs [4741-50]**

V. Lutsiv, I. Malyshev, V. Pepelka, A. Potapov