## Contents

<table>
<thead>
<tr>
<th>SESSION 1</th>
<th>DETECTION, IDENTIFICATION, AND QUANTIFICATION I</th>
</tr>
</thead>
<tbody>
<tr>
<td>8048 02</td>
<td>Generalized fusion: a new framework for hyperspectral detection (Invited Paper) [8048-01]</td>
</tr>
<tr>
<td></td>
<td>P. Bajorski, Rochester Institute of Technology (United States)</td>
</tr>
<tr>
<td>8048 03</td>
<td>Design methods for continuum fusion detectors [8048-02]</td>
</tr>
<tr>
<td></td>
<td>A. Schaum, U.S. Naval Research Lab. (United States)</td>
</tr>
<tr>
<td>8048 04</td>
<td>Linear log-likelihood ratio (L²R) algorithm for spectral target detection [8048-03]</td>
</tr>
<tr>
<td></td>
<td>B. J. Daniel, A. P. Schaum, U.S. Naval Research Lab. (United States)</td>
</tr>
<tr>
<td>8048 05</td>
<td>Algorithm for detecting anomaly in hyperspectral imagery using factor analysis [8048-04]</td>
</tr>
<tr>
<td></td>
<td>E. Lo, Susquehanna Univ. (United States); J. Ingram, U.S. Military Academy (United States)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SESSION 2</th>
<th>CHANGE DETECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>8048 06</td>
<td>Extension and implementation of a model-based approach to hyperspectral change detection [8048-05]</td>
</tr>
<tr>
<td></td>
<td>J. Meola, M. T. Eismann, U.S. Air Force Research Lab. (United States); R. L. Moses, J. N. Ash, The Ohio State Univ. (United States)</td>
</tr>
<tr>
<td>8048 07</td>
<td>Overlapping image segmentation for context-dependent anomaly detection [8048-06]</td>
</tr>
<tr>
<td></td>
<td>J. Theiler, L. Prasad, Los Alamos National Lab. (United States)</td>
</tr>
<tr>
<td>8048 08</td>
<td>Change detection using mean-shift and outlier-distance metrics [8048-07]</td>
</tr>
<tr>
<td></td>
<td>J. Zollweg, A. Schlamm, Rochester Institute of Technology (United States); D. B. Gillis, U.S. Naval Research Lab. (United States); D. Messinger, Rochester Institute of Technology (United States)</td>
</tr>
<tr>
<td>8048 09</td>
<td>Graph theoretic metrics for spectral imagery with application to change detection [8048-08]</td>
</tr>
<tr>
<td></td>
<td>J. A. Albano, D. W. Messinger, A. Schlamm, W. Basener, Rochester Institute of Technology (United States)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SESSION 3</th>
<th>SPECTRAL DATA ANALYSIS METHODOLOGIES I</th>
</tr>
</thead>
<tbody>
<tr>
<td>8048 0A</td>
<td>Understanding the influence of turbulence in imaging Fourier transform spectroscopy of smokestack plumes [8048-10]</td>
</tr>
<tr>
<td></td>
<td>J. L. Massman, K. C. Gross, Air Force Institute of Technology (United States)</td>
</tr>
</tbody>
</table>
8048 OB Anomaly detection of man-made objects using spectropolarimetric imagery [8048-11]
B. D. Bartlett, A. Schlamm, C. Salvaggio, D. W. Messinger, Rochester Institute of Technology (United States)

8048 OC Selecting training and test images for optimized anomaly detection algorithms in hyperspectral imagery through robust parameter design [8048-12]
F. M. Mindrup, M. A. Friend, K. W. Bauer, Air Force Institute of Technology (United States)

8048 OD An automated method for identification and ranking of hyperspectral target detections [8048-14]
B. Basener, Rochester Institute of Technology (United States)

8048 OE Enhancement of flow-like structures in hyperspectral imagery using tensor nonlinear anisotropic diffusion [8048-15]
M. Marin-McGee, M. Velez-Reyes, Univ. de Puerto Rico Mayaguez (United States)

SESSION 4 SPECTRAL METHODOLOGIES AND APPLICATIONS I

8048 OF Supporting relief efforts of the 2010 Haitian earthquake using an airborne multimodal remote sensing platform [8048-16]
J. W. Faulring, D. M. McKeown, J. van Aardt, M. V. Casterline, B. D. Bartlett, N. Raqueno, Rochester Institute of Technology (United States)

8048 OG Demonstration of delivery of orthoimagery in real time for local emergency response [8048-17]
D. McKeown, J. Faulring, R. Krzaczek, S. Cavilia, J. van Aardt, Rochester Institute of Technology (United States)

8048 OH Deepwater Horizon oil spill monitoring using airborne multispectral infrared imagery [8048-18]
S. S. Shen, The Aerospace Corp. (United States); P. E. Lewis, National Geospatial-Intelligence Agency (United States)

8048 OI Evaluation of potential emission spectra for the reliable classification of fluorescently coded materials [8048-20]
S. Brunner, C. Kargel, Univ. der Bundeswehr München (Germany)

SESSION 5 ADVANCEMENTS IN SPECTRAL SENSOR TECHNOLOGIES

8048 OJ Image mapping spectrometry: a novel hyperspectral platform for rapid snapshot imaging (Invited Paper) [8048-21]
R. T. Kester, N. Bedard, T. S. Tkaczyk, Rice Univ. (United States)

8048 OK A Fabry-Perot interferometer with a spatially variable resonance gap employed as a Fourier transform spectrometer [8048-22]
P. G. Lucey, Univ. of Hawaii at Manoa (United States); J. Akagi, Spectrum Photonics, Inc. (United States)

8048 OL The enhanced MODIS airborne simulator hyperspectral imager [8048-23]
D. C. Gerlin, J. Fisher, E. R. Graham, Brandywine Photonics, LLC (United States)
An interference microfilter array with tunable spectral response for each pixel [8048-24]
F. E. Strömqvist Vetelino, A. A. Abtahi, Aerospace Missions Corp. (United States); P. B. Griffin, Stanford Univ. (United States); R. J. Morgan, U. Raghuram, Aerospace Missions Corp. (United States); F. Tejada, Sensing Machines (United States)

Broadband source for multispectral imager characterization [8048-26]
J. A. Mazzetta, M. A. Medina, S. D. Scoptaz, Electro Optical Industries, Inc. (United States)

SESSION 6 SPECTRAL DATA ANALYSIS METHODOLOGIES II

Hyperspectral processing in graphical processing units [8048-27]

GPGPU-based real-time conditional dilation for adaptive thresholding for target detection [8048-71]
J. Morgenstern, B. Zell, Vision4ce LLC (United States)

Evaluation of the GPU architecture for the implementation of target detection algorithms for hyperspectral imagery [8048-28]
B. Trigueros-Espinosa, M. Vélez-Reyes, N. G. Santiago-Santiago, S. Rosario-Torres, Univ. de Puerto Rico Mayagüez (United States)

Parallel implementation of nonlinear dimensionality reduction methods applied in object segmentation using CUDA in GPU [8048-29]
R. Campana-Olivo, V. Manian, Univ. de Puerto Rico Mayagüez (United States)

Real-time georeferencing for an airborne hyperspectral imaging system [8048-31]
T. Opsahl, T. V. Haavardsholm, I. Winjum, Norwegian Defence Research Establishment (Norway)

SESSION 7 SPECTRAL METHODOLOGIES AND APPLICATIONS II

Identification and mapping of night lights' signatures using hyperspectral data [8048-32]
F. A. Kruse, Naval Postgraduate School (United States); C. D. Elvidge, National Oceanic and Atmospheric Administration (United States)

Ship detection in MODIS Imagery [8048-33]
L. P. Dorado-Munoz, M. Velez-Reyes, Univ. de Puerto Rico Mayagüez (United States)

Multiresolution and directional filtering techniques for detecting dust storm direction in satellite imagery [8048-35]
M. Q. Alkhatib, S. D. Cabrera, The Univ. of Texas at El Paso (United States)

High spatial resolution bidirectional reflectance retrieval using satellite data [8048-34]
R. C. Olsen, A. M. Kim, C. McConnon, Naval Postgraduate School (United States)
SESSION 8  CLUSTERING AND CLASSIFICATION

8048 OX  Object classification using discriminating features derived from higher-order spectra of hyperspectral imagery [8048-37]
K. N. Zachery, J. Zhou, Y. Liao, M. Peat, Teledyne Scientific & Imaging, LLC (United States)

8048 OY  Trilateral filter on multispectral imagery for classification and segmentation [8048-38]
W. Sun, D. W. Messinger, Rochester Institute of Technology (United States)

8048 OZ  Automatic clustering of multispectral imagery by maximization of the graph modularity [8048-39]
R. A. Mercovich, A. Harkin, D. Messinger, Rochester Institute of Technology (United States)

8048 10  A scalable hierarchical approach for leveraging low resolution imagery for image classification [8048-40]
F. Padula, H. Gross, C. Munechika, D. Pogorzala, Integrity Applications, Inc. (United States)

8048 11  Multiclass subpixel target detection using functions of multiple instances [8048-41]
A. Zare, Univ. of Missouri-Columbia (United States); P. Gader, Univ. of Florida (United States)

SESSION 9  LANDSAT DATA CONTINUITY MISSION

8048 12  The Operational Land Imager (OLI) and the Thermal Infrared Sensor (TIRS) on the Landsat Data Continuity Mission (LDCM) [8048-42]
D. Reuter, J. Irons, NASA Goddard Space Flight Ctr. (United States); A. Lunsford, NASA Goddard Space Flight Ctr. (United States) and The Catholic Univ. of America (United States); M. Montanaro, NASA Goddard Space Flight Ctr. (United States) and Sigma Space Corp. (United States); F. Pellerano, C. Richardson, R. Smith, NASA Goddard Space Flight Ctr. (United States); Z. Tesfaye, NASA Goddard Space Flight Ctr. (United States) and Millenium Engineering and Integration Co. (United States); K. Thome, NASA Goddard Space Flight Ctr. (United States)

8048 13  Calibration plan for the thermal infrared sensor on the Landsat Data Continuity Mission [8048-43]
K. Thome, NASA Goddard Space Flight Ctr. (United States); A. Lunsford, The Catholic Univ. of America (United States); M. Montanaro, Sigma Space Corp. (United States); D. Reuter, R. Smith, NASA Goddard Space Flight Ctr. (United States); Z. Tesfaye, Basilion Technologies, Inc. (United States); B. Wenny, Sigma Space Corp. (United States)

8048 14  Modeling space-based multispectral imaging systems with DIRSIG [8048-44]
S. D. Brown, N. J. Sanders, A. A. Goodenough, M. Gartley, Rochester Institute of Technology (United States)

8048 15  Data-driven simulations of the Landsat Data Continuity Mission (LDCM) platform [8048-45]
A. Gerace, M. Gartley, J. Schott, N. Raqueño, R. Raqueño, Rochester Institute of Technology (United States)
Spectral analysis of the primary flight focal plane arrays for the thermal infrared sensor
[8048-46]
M. Montanaro, NASA Goddard Space Flight Ctr. (United States) and Sigma Space Corp. (United States); D. C. Reuter, B. L. Markham, K. J. Thome, NASA Goddard Space Flight Ctr. (United States); A. W. Lunsford, NASA Goddard Space Flight Ctr. (United States) and The Catholic Univ. of America (United States); M. D. Jhabvala, S. O. Rohrbach, NASA Goddard Space Flight Ctr. (United States); A. D. Gerace, Rochester Institute of Technology (United States)

 Joint segmentation and reconstruction of hyperspectral images from a single snapshot
[8048-47]
Q. Zhang, R. J. Plemmons, Wake Forest Univ. (United States); D. Kittle, D. Brady, Duke Univ. (United States); S. Prasad, The Univ. of New Mexico (United States)

Estimation of low resolution visible spectra from RGB imagery: II. Simulation result [8048-48]
H. C. Schau, Meridian Systems LLC (United States)

A multiband statistical restoration of the Aqua MODIS 1.6 micron band [8048-49]
I. Gladkova, M. Grossberg, G. Bonev, The City College of New York (United States); F. Shahrir, CUNY Graduate Ctr. (United States)

Estimating true color imagery for GOES-R [8048-50]
M. D. Grossberg, The City College of New York (United States); F. Shahrir, CUNY Graduate Ctr. (United States); I. Gladkova, P. K. Alabi, The City College of New York (United States); D. W. Hillger, NOAA/NESDIS Regional and Mesoscale Metrology Branch (United States); S. D. Miller, Cooperative Institute for Research in the Atmosphere (United States)

A new deblurring morphological filter for hyperspectral images [8048-51]
E. E. F. Abdelkawy, T. A. Mahmoud, W. M. Hussein, Military Technical College (Egypt)

Hyperspectral anomaly detection using sparse kernel-based ensemble learning [8048-52]
P. Gurram, U.S. Army Research Lab. (United States); T. Han, The Johns Hopkins Univ. (United States); H. Kwon, U.S. Army Research Lab. (United States)

Effects of random measurements on the performance of target detection in hyperspectral imagery [8048-53]
Y. Chen, The Johns Hopkins Univ. (United States); N. M. Nasrabadi, U.S. Army Research Lab. (United States); T. D. Tran, The Johns Hopkins Univ. (United States)

Implications of model mismatch and covariance contamination on chemical detection algorithms [8048-54]
S. Niu, Northeastern Univ. (United States); S. E. Golowich, MIT Lincoln Lab. (United States); V. K. Ingle, Northeastern Univ. (United States); D. G. Manolakis, MIT Lincoln Lab. (United States)
8048 1F  Performance limits of LWIR gaseous plume quantification [8048-55]
S. E. Golowich, D. G. Manolakis, MIT Lincoln Lab. (United States)

SESSION 12  SPECTRAL DATA ANALYSIS METHODOLOGIES IV

8048 1G  Multi- and hyperspectral scene modeling [8048-56]
C. C. Borel, R. F. Tuttle, Air Force Institute of Technology (United States)

8048 1H  The target implant method for predicting target difficulty and detector performance in hyperspectral imagery [8048-57]
W. F. Basener, Rochester Institute of Technology (United States); E. Nance, Raytheon Intelligence & Information Systems (United States); J. Kerekes, Rochester Institute of Technology (United States)

8048 11  Dynamic dimensionality reduction for hyperspectral imagery [8048-58]
H. Safavi, K.-H. Liu, C.-I Chang, Univ. of Maryland, Baltimore County (United States)

8048 1J  An empirical estimate of the multivariate normality of hyperspectral image data [8048-59]
A. Schlamm, D. Messinger, Rochester Institute of Technology (United States)

8048 1K  Interactive visualization of hyperspectral images on a hyperbolic disk [8048-60]
A. A. Goodenough, A. Schlamm, S. D. Brown, D. Messinger, Rochester Institute of Technology (United States)

8048 1L  Realism, utility, and evolution of remotely sensed simulations [8048-61]
E. Ontiveros, M. Gartely, S. Brown, R. Raqueno, Rochester Institute of Technology (United States); D. Pogorzala, Integrity Applications, Inc. (United States)

SESSION 13  ENDMEMBER EXTRACTION AND SPECTRAL UNMIXING

8048 1M  Simultaneous sparse recovery for unsupervised hyperspectral unmixing [8048-62]

8048 1N  Joint sparsity for target detection [8048-63]
Y. Chen, The Johns Hopkins Univ. (United States); N. M. Nasrabadi, U.S. Army Research Lab. (United States); T. D. Tran, The Johns Hopkins Univ. (United States)

8048 1O  High spatial resolution hyperspectral spatially adaptive endmember selection and spectral unmixing [8048-64]
K. Canham, A. Schlamm, B. Basener, D. Messinger, Rochester Institute of Technology (United States)

8048 1P  Kernel-based weighted abundance constrained linear spectral mixture analysis [8048-65]
K.-H. Liu, E. Wong, C.-I Chang, Univ. of Maryland, Baltimore County (United States)
### POSTER SESSION

#### 8048 1Q
**Hyperspectral band selection using statistical models** [8048-67]
J. Maerker, W. Groß, W. Middelmann, A. Ebert, Fraunhofer Institute of Optronics, System Technologies and Image Exploitation (Germany)

#### 8048 1R
**Noise reduction of hyperspectral images using a joint bilateral filter with fused images** [8048-68]

#### 8048 1S
**Spectrum reconstruction for filter-array spectrum sensor using sparse representation** [8048-69]
C.-C. Chang, N.-T. Lin, National Taipei Univ. of Technology (Taiwan); U. Kurokawa, B. I. Choi, NanoLambda, Inc. (United States)

#### 8048 1T
**Subpixel target detection and enhancement in hyperspectral images** [8048-70]
K. C. Tiwari, M. Arora, D. Singh, Indian Institute of Technology Roorkee (India)

*Author Index*