Front Matter: Volume 8747
Contents

vii Conference Committee
ix Introduction

SESSION 1 GEO-REGISTRATION AND UNCERTAINTY HANDLING IN GEOSPATIAL DATA

8747 02 The full multi-state vector error covariance matrix: why needed and its practical representation [8747-1]
J. T. Dolloff, National Geospatial-Intelligence Agency (United States)

8747 03 Evaluating conflation methods using uncertainty modeling [8747-2]
P. Doucette, J. Dolloff, R. Canavosio-Zuzelski, M. Lenihan, D. Motsko, National Geospatial-Intelligence Agency (United States)

8747 05 Uncertainty quantification techniques for population density estimates derived from sparse open source data [8747-4]
R. Stewart, D. White, Oak Ridge National Lab. (United States) and The Univ. of Tennessee (United States); M. Urban, A. Morton, C. Webster, M. Stoyanov, E. Bright, Oak Ridge National Lab. (United States); B. L. Bhaduri, Oak Ridge National Lab. (United States) and The Univ. of Tennessee (United States)

8747 06 Geoaccurate three-dimensional reconstruction via image-based geometry [8747-5]
D. J. Walvoord, A. J. Rossi, B. D. Paul, B. Brower, M. F. Pellechia, Exelis Inc. (United States)

8747 07 Guidance in feature extraction to resolve uncertainty [8747-6]
B. Kovalerchuk, Central Washington Univ. (United States) and BKF Systems (United States); M. Kovalerchuk, BKF Systems (United States); S. Streltsov, LongShort Way Inc. (United States); M. Best, U.S. Air Force (United States)

8747 08 A fast, accurate, cross-modality image geo-registration and target/object detection algorithm [8747-7]
T. Mckay, CACI International, Inc. (United States); H. Hirsch, Hirsch Engineering and Communications, Inc. (United States)

8747 09 Improved evaluation of geo-registration algorithms for airborne EO/IR imagery [8747-8]
C. N. Taylor, Air Force Research Lab. (United States)

SESSION 2 GEOSPATIAL INFORMATION APPLICATION NEEDS AND CHALLENGES

8747 0A Geodata fusion study by the Open Geospatial Consortium [8747-9]
G. Percivall, Open Geospatial Consortium (United States)
Overview of contextual tracking approaches in information fusion [8747-10]
E. Blasch, Air Force Research Lab. (United States); J. Garcia Herrero, Univ. Carlos III de Madrid (Spain); L. Snidarò, Univ. of Udine (Italy); J. Linas, Univ. at Buffalo (United States); G. Seetharaman, Air Force Research Lab. (United States); K. Palaniappan, Univ. of Missouri-Columbia (United States)

Geometric exploration of virtual planes in a fusion-based 3D data registration framework [8747-11]
H. Aliakbarpour, Univ. of Coimbra (Portugal) and Univ. of Missouri-Columbia (United States); K. Palaniappan, Univ. of Missouri-Columbia (United States); J. Dias, Univ. of Coimbra (Portugal) and Khalifa Univ. (United Arab Emirates)

SESSION 3 GEOSPATIAL DATA PROCESSING EXPLOITATION AND VISUALIZATION

Application of feature descriptors to low-pixel-count persistent surveillance tracking systems [8747-12]
J. Edelberg, C. Miller, M. Wilson, Naval Research Lab. (United States)

A position-independent image complexity selector (PICSEL) for enhanced visualization and intuitive object detection in images [8747-14]
T. McKay, CACI International, Inc. (United States); H. Hirsch, Hirsch Engineering and Communications, Inc. (United States)

Feature selection for appearance-based vehicle tracking in geospatial video [8747-16]
M. Poostchi, F. Bunyak, K. Palaniappan, Univ. of Missouri-Columbia (United States); G. Seetharaman, Air Force Research Lab. (United States)

Vehicle detection and orientation estimation using the radon transform [8747-18]
R. Pelapur, F. Bunyak, K. Palaniappan, Univ. of Missouri-Columbia (United States); G. Seetharaman, Air Force Research Lab. (United States)

SESSION 4 GEOSPATIAL PROCESSING EXPLOITATION AND VISUALIZATION

Evaluating fusion techniques for multisensor satellite image data [8747-19]
B. W. Martin, The Univ. of Tennessee Knoxville (United States); R. R. Vatsavai, Oak Ridge National Lab. (United States)

Usage of data-encoded web maps with client side color rendering for combined data access, visualization, and modeling purposes [8747-20]
D. Pliutau, N. S. Prasad, NASA Langley Research Ctr. (United States)

Correlation of partial frames in video matching [8747-21]
B. Kovalerchuk, Central Washington Univ. (United States) and BKF Systems (United States); M. Kovalerchuk, BKF Systems (United States)

Subdimensional geo-localization from finite set statistics [8747-22]
F. Boyle, L-3 Communications Integrated Systems (United States)
KOLAM: a cross-platform architecture for scalable visualization and tracking in wide-area imagery [8747-23]
J. Fraser, A. Haridas, Univ. of Missouri-Columbia (United States); G. Seetharaman, Air Force Research Lab. (United States); R. M. Rao, U.S. Army Research Lab. (United States); K. Palaniappan, Univ. of Missouri-Columbia (United States)

A Semi-Automated Building Outline Tool (SABOT) [8747-24]
S. Simmons, M. Thompson, D. Lamb, T. McKay, CACI International, Inc. (United States); H. Hirsch, Hirsch Engineering and Communications, Inc. (United States)

Mining patterns in persistent surveillance systems with smart query and visual analytics [8747-26]
M. S. Habibi, A. Shirkhodaie, Tennessee State Univ. (United States)

Author Index
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1. Geo-registration and Uncertainty Handling in Geospatial Data
   Peter Doucette, National Geospatial-Intelligence Agency (United States)

2. Geospatial Information Application Needs and Challenges
   Paul B. Deignan, L-3 Communications Integrated Systems (United States)

3. Geospatial Data Processing Exploitation and Visualization
   Paul B. Deignan, L-3 Communications Integrated Systems (United States)

4. Geospatial Processing Exploitation and Visualization
   Kannappan Palaniappan, Univ. of Missouri-Columbia (United States)

Panel on Synergistic Data Fusion through Multi-Sensing Enablement
Shiloh L. Dockstader, ITT Exelis (United States)
Introduction

A Geospatial Information System (GIS) describes any information system that collects, integrates, stores, edits, analyzes, shares, and displays geographic information. GIS systems are fundamental to today’s information networks and inherently encompass techniques that transform “raw bits and bytes” into “actionable information”, also termed InfoFusion. GIS applications incorporate tools that allow users to create interactive queries (user-created searches), analyze spatial information, edit data, maps, and present the results of all these operations. In the commercial sector, GIS systems are used in cartography, remote sensing, land surveying, utility management, geographical strategic natural resource planning, photogrammetric science, geography, urban planning, emergency management, navigation, and localized search engines. For example, defense and security applications, such as Unmanned Ariel Systems and Airport Security Systems, are rapidly transforming from basic sensor collection systems that “take pictures” to fully-capable GIS systems that incorporate multi-sensor collections, perform advanced processing and correlations in real-time, initiate sensor cross-cueing, and allow multiple users to instantly retrieve and disseminate information. GIS is critical to defense and security providers in order to enable satisfying emerging demands and rapid access to information for situational awareness and forensic back-tracking missions.

These proceedings provide the SPIE community with a collection of perspectives, advancements, learning, and new solutions from a range of global industry, government and academic authors. The motivation of this conference track is simple: to expand the awareness of advanced architectures and enabling technologies that address emerging and adaptive security threats. Technical and scientific papers related to advancements in Architectures for GIS Collection Sensors, Data Processing Algorithms and Techniques, Information Dissemination, Serving, Search, and Query Methodologies, and Information Visualization Solutions that push beyond the scope of the state-of-the-art in industry are solicited.

On behalf of the Conference Chairs, Dr. Kannappan Palaniappan, Mr. Matthew Pellechia, and Mr. Richard Sorensen, and our cochairs, we hope you find these proceedings useful in the advancement of GIS technologies.

Matthew F. Pellechia
Richard J. Sorensen
Kannappan Palaniappan