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***Unattended Ground, Sea, and  
Air Sensor Technologies and  
Applications XII***

**Edward M. Carapezza**  
*Editor*

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# Contents

vii	<i>Conference Committee</i>
xi	<i>Introduction</i>

---

## LASER AND OTHER TECHNOLOGY

---

- 7693 03 **Engineering rare-earth-doped heavy metal oxide glasses for 2-5  $\mu\text{m}$  lasers** [7693-02]  
B. D. O. Richards, A. Jha, Univ. of Leeds (United Kingdom); V. Dorofeev, Institute of Chemistry of High-Purity Substances (Russian Federation); T. Manzur, Naval Undersea Warfare Ctr. (United States)
- 7693 07 **Distributed optical microsensors for hydrogen leak detection and related applications** [7693-06]  
S. R. Hunter, Oak Ridge National Lab. (United States); J. F. Patton, M. J. Sepaniak, The Univ. of Tennessee (United States); P. G. Datskos, Oak Ridge National Lab. (United States) and The Univ. of Tennessee (United States); D. B. Smith, Oak Ridge National Lab. (United States)
- 7693 08 **Chalcogenide fiber for mid-infrared transmission and generation of laser source** [7693-07]  
F. Chenard, R. A. Kuis, IRflex Corp. (United States)

---

## EO/IR TECHNOLOGY FOR UGS

---

- 7693 0C **Next generation nanostructure-based EO/IR focal plane arrays for unattended ground sensor applications** [7693-11]  
A. K. Sood, R. A. Richwine, Y. R. Puri, Magnolia Optical Technologies, Inc. (United States); T. Manzur, Naval Undersea Warfare Ctr. (United States); N. K. Dhar, D. L. Polla, Defense Advanced Research Projects Agency (United States); P. S. Wijewarnasuriya, U.S. Army Research Lab. (United States); Y. Wei, J. Zhou, C. Li, Z. L. Wang, Georgia Institute of Technology (United States); G. Fernandes, J. M. J. Xu, Brown Univ. (United States)
- 7693 0G **High-resolution streaming video integrated with UGS systems** [7693-15]  
M. Rohrer, McQ, Inc. (United States)

---

## SIGNAL PROCESSING AND SENSOR FUSION

---

- 7693 0H **Sensor and information fusion for improved hostile fire situational awareness** [7693-16]  
M. V. Scanlon, W. D. Ludwig, U. S. Army Research Lab. (United States)
- 7693 0K **Development of an infrared imaging classifier for UGS** [7693-19]  
B. D'Agostino, M. McCormack, B. Steadman, Textron Defense Systems (United States)

- 7693 0L **A learning-based autonomous driver: emulate human driver's intelligence in low-speed car following** [7693-20]  
J. Wei, Carnegie Mellon Univ. (United States); J. M. Dolan, Carnegie Mellon Univ. (United States) and The Robotics Institute, Carnegie Mellon Univ. (United States); B. Litkouhi, GM-CMU Autonomous Driving Collaborative Research Lab., General Motors Corp. (United States)
- 7693 0M **Planning to fail: using reliability to improve multirobot task allocation** [7693-21]  
S. B. Stancliff, Energetics Technology Ctr. of Southern Maryland (United States); J. M. Dolan, Carnegie Mellon Univ. (United States)
- 7693 0N **Learning a detection map for a network of unattended ground sensors** [7693-22]  
M. W. Koch, H. D. Nguyen, Sandia National Labs. (United States)
- 7693 0O **Assessment of a linear pyroelectric array sensor for profile classification** [7693-23]  
J. B. Brown, S. Chari, The Univ. of Memphis (United States); J. Hutchison, J. Gabonia, U.S. Army Night Vision & Electronic Sensors Directorate (United States); E. Jacobs, The Univ. of Memphis (United States)

---

#### PERIMETER SURVEILLANCE AND SECURITY

---

- 7693 0S **Unattended monitoring of suspicious behavior for route surveillance** [7693-28]  
R. Schoemaker, R. Sandbrink, G. van Voorthuijsen, TNO Defence, Security and Safety (Netherlands)
- 7693 0T **Efficient deployment of fiber-optic cable seismic sensors** [7693-29]  
N. C. Rowe, Naval Postgraduate School (United States)

---

#### MARITIME UGS AND APPLICATIONS

---

- 7693 0W **Edge systems in the deep ocean (Invited Paper)** [7693-32]  
A. Coon, Defense Advanced Research Projects Agency (United States); S. L. Earp, Multisensor Science, LLC (United States)
- 7693 0X **Keeping our waterways safe by equipping commercial vessels with appropriate sensor suites to enable pervasive surveillance of coastal and inland waterborne commercial traffic** [7693-33]  
T. Feeley, J. Lavoie, Rite-Solutions, Inc. (United States)
- 7693 0Y **Semi-fuel cell studies for powering underwater devices: integrated design for maximized net power output** [7693-34]  
A. M. Cardenas-Valencia, R. T. Short, L. Adornato, L. Langebrake, SRI International (United States)
- 7693 10 **An optimization approach to generate robust tradeoffs for the configuration of passive sensor fields against moving targets** [7693-36]  
T. A. Wettergren, Naval Undersea Warfare Ctr. (United States)

---

## ACOUSTIC, MAGNETIC, AND SEISMIC SENSING

---

- 7693 11 **Time-domain classification of humans using seismic sensors** [7693-38]  
S. Schumer, U.S. Army Research, Development and Engineering Command (United States)
- 7693 12 **Development of acoustic sniper localization methods and models** [7693-39]  
D. Grasing, B. Ellwood, U.S. Army Research, Development and Engineering Command (United States)
- 7693 13 **Sensitive optical atomic magnetometer based on nonlinear magneto-optical rotation** [7693-40]  
C. Hovde, Southwest Sciences, Inc. (United States); B. Patton, E. Corsini, Univ. of California, Berkeley (United States); J. Higbie, Bucknell Univ. (United States); D. Budker, Univ. of California, Berkeley (United States)

---

## BIO-INSPIRED TECHNOLOGY FOR UGS

---

- 7693 1A **BackyardNet: distributed sensor network powered by terrestrial microbial fuel cell technology** [7693-47]  
K. G. Cooke, M. O. Gay, S. E. Radachowsky, J. J. Guzman, M. A. Chiu, Trophos Energy, Inc. (United States)
- 7693 1B **A high-throughput label-free cell-based biosensor (CBB) system** [7693-48]  
F. Xu, S. Moon, Brigham and Women's Hospital, Harvard Medical School (United States); E. Hefner, Brigham and Women's Hospital, Harvard Medical School (United States) and Massachusetts Institute of Technology (United States); T. Beyazoglu, A. E. Emre, Brigham and Women's Hospital, Harvard Medical School (United States); T. Manzur, Naval Undersea Warfare Ctr. (United States); U. Demirci, Brigham and Women's Hospital, Harvard Medical School (United States) and Harvard-Massachusetts Institutes of Technology Health Sciences and Technology (United States)

---

## SENSOR NETWORKS AND COMMUNICATIONS

---

- 7693 1D **Seismic-acoustic communication for UGS** [7693-50]  
J. Cechak, Univ. of Defence (Czech Republic)
- 7693 1F **Atmospheric transmission at ~1.55  $\mu\text{m}$  for free-space optical communication** [7693-53]  
J. Zeller, T. Manzur, Naval Undersea Warfare Ctr. (United States)
- 7693 1G **Exploratory community sensing in social networks** [7693-54]  
A. Khrabrov, G. Stocco, G. Cybenko, Dartmouth College (United States)

---

## PANEL DISCUSSION: UGS - FUTURE TECHNOLOGIES AND CHALLENGES

---

- 7693 1J **Advanced unattended sensors and systems: state of the art and future challenges (Invited Paper)** [7693-57]  
J. H. McQuiddy, McQ, Inc. (United States)

---

## UNATTENDED SENSOR SYSTEMS

---

- 7693 1L **Enhanced technologies for unattended ground sensor systems** [7693-59]  
D. C. Hartup, L-3 Communications Nova Engineering (United States)
- 7693 1M **UGS-technology-driven application expansion** [7693-60]  
J. H. McQuiddy, McQ, Inc. (United States)
- 7693 1O **Affordable next-generation UGS development and testing** [7693-62]  
M. Winston, D. Egerton, J. McQuiddy, B. Jones, McQ, Inc. (United States)
- 7693 1Q **SCORPION II persistent surveillance system update** [7693-64]  
M. Coster, J. Chambers, Northrop Grumman-Xetron (United States)
- 7693 1R **A roadmap to truly disposable unattended ground sensor (UGS) systems** [7693-65]  
B. M. Jones, McQ, Inc. (United States)

*Author Index*

# Conference Committee

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**Graeme P. van Voorthuijsen**, TNO Defence, Security and Safety  
(Netherlands)

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- 1 Laser and Other Technology  
**John M. Dolan**, Carnegie Mellon University (United States)  
**Tariq Manzur**, Naval Undersea Warfare Center (United States)
- 2 EO/IR Technology for UGS  
**John M. Dolan**, Carnegie Mellon University (United States)  
**Myron E. Hohil**, U.S. Army Research, Development and Engineering Command (United States)
- 2 Signal Processing and Sensor Fusion  
**John M. Dolan**, Carnegie Mellon University (United States)  
**Myron E. Hohil**, U.S. Army Research, Development and Engineering Command (United States)
- 4 Air/Ground Collaboration  
**Myron E. Hohil**, U.S. Army Research, Development and Engineering Command (United States)
- 5 Perimeter Surveillance and Security  
**Sachi V. Desai**, U.S. Army Armament Research, Development and Engineering Center (United States)
- 6 Maritime UGS and Applications  
**Sachi V. Desai**, U.S. Army Armament Research, Development and Engineering Center (United States)  
**George McNamara**, Naval Undersea Warfare Center (United States)  
**Tariq Manzur**, Naval Undersea Warfare Center (United States)
- 7 Acoustic, Magnetic, and Seismic Sensing  
**Sachi V. Desai**, U.S. Army Armament Research, Development and Engineering Center (United States)  
**Myron E. Hohil**, U.S. Army Research, Development and Engineering Command (United States)
- 8 Bio-Inspired Technology for UGS  
**Myron E. Hohil**, U.S. Army Research, Development and Engineering Command (United States)  
**Daniel Lehrfeld**, Blue Marble Group, LLC (United States)
- 9 Sensor Networks and Communications  
**Myron E. Hohil**, U.S. Army Research, Development and Engineering Command (United States)  
**Daniel Lehrfeld**, Blue Marble Group, LLC (United States)

- 10 Panel Discussion: UGS - Future Technologies and Challenges  
**Myron E. Hohil**, U.S. Army Research, Development and Engineering Command (United States)
- 11 Unattended Sensor Systems  
**Myron E. Hohil**, U.S. Army Research, Development and Engineering Command (United States)
- 12 Ground Surveillance System I: Joint Session with Conference 7666  
**Daniel Lehrfeld**, Blue Marble Group, LLC (United States)
- 13 Ground Surveillance System II: Joint Session with Conference 7666  
**Daniel Lehrfeld**, Blue Marble Group, LLC (United States)
- 14 Counter Sniper: Joint Session with Conference 7666  
**Myron E. Hohil**, U.S. Army Research, Development and Engineering Command (United States)
- 15 Maritime and Port Surveillance I: Joint Session with Conference 7666  
**Han Q. Le**, University of Houston (United States)  
**George McNamara**, Naval Undersea Warfare Center (United States)
- 16 Maritime and Port Surveillance II: Joint Session with Conference 7666  
**Han Q. Le**, University of Houston (United States)  
**George McNamara**, Naval Undersea Warfare Center (United States)



## Introduction

The interest in unattended sensor technologies and applications has dramatically increased over the past several years. Systems are being developed in support of military, homeland security, intelligence, law enforcement, physical security, and environmental monitoring applications around the world. Government agencies are making significant investments to develop improved unattended sensors and sensor networks. Recently the United States and other countries have significantly increased the use of unattended ground, sea, and air sensors for homeland security applications, such as land border and coastal shore monitoring. This SPIE conference series is devoted to papers on recent technological advancements in unattended ground, sea, and air sensor technologies and applications

The conference included four keynote/invited talks and 85 technical paper presentations organized into 11 technical sessions covering recent advances in Laser, EO/IR, Signal Processing, Sensor Fusion, Air/Ground Collaboration, Perimeter Surveillance and Security, Maritime UGS and Applications, Bio-Inspired Technology for UGS, Acoustic, Magnetic, and Seismic Sensing, Sensor Networks and Communications, and five additional joint sessions with Sensors and C3I Technologies for Homeland Security and Homeland Defense (Conference 7666) on Ground Surveillance, Counter Sniper, and Maritime and Port Surveillance Systems.

The following five keynote/invited presentations were given and we sincerely thank all of the following speakers for very stimulating and relevant presentations:

- 1) "UUV autonomy considerations for extended reach of naval platforms" by Dr. P. J. Corriveau (Naval Undersea Warfare Center)
- 2) "Advanced distributed maritime sensors" by Dr. A. Coon (Defense Advanced Research Projects Agency)
- 3) "Nano-engineered chemical and biological sensors with unprecedented sensitivity based on SERS: opportunities and challenges" by Dr. M. Moskovits (University of California, Santa Barbara)
- 4) "Free-surface microfluidics for control of SERS hot-spot formation" by Dr. C. D. Meinhart (University of California, Santa Barbara)
- 5) Bio-inspired networks for command and control Dr. J. P. Hespanha (University of California, Santa Barbara)

Additionally a special panel titled "Future Technologies and Challenges for Unattended Sensor Systems" was included in the program. The following four

additional invited papers were presented during this panel discussion and we sincerely thank all of the following speakers for very stimulating and relevant presentations:

- 1) "Department of Homeland Security (DHS) Science and Technology Unattended Ground Sensor (UGS) focus areas and capabilities" by Dr. John Appleby (U.S. Department of Homeland Security)
- 2) "Future trends in MEMS and NEMS" by Dr. Panos Datskos (Oak Ridge National Laboratory)
- 3) "Advanced unattended sensors and systems: state of art and future challenges" by Dr. John McQuiddy (McQ Inc.)
- 4) "Future directions in sensor technologies" by Dr. Jennifer Ricklin (Lockheed Martin Corporation)

Thanks to those who prepared and presented the technical papers and for their contribution to a very successful meeting. The success of this conference is attributed to the participation of the commercial, university, and government research-and-development community as well as the organizing efforts of the diverse and talented program committee.

Thanks to our program committee members for their dedication, time and assistance in conference planning and organizing and especially to those members who were able to participate as session chairs including: Todd Hintz (Naval Space and Warfare Center), Myron Hohil (U.S. Army Research, Development and Engineering Command), Dan Lehrfeld (Blue Marble Group), Tariq Manzur (Naval Undersea Warfare Center), George McNamara (Naval Undersea Warfare Center), and Sachi Desai (U.S. Army Research, Development and Engineering Command).

Very special thanks to two of our program committee members who worked extra hard to help organize this challenging conference: Todd Hintz and Myron Hohil. We could not have had so successful a technical conference without their excellent help and dedication.

Finally, an extra special thanks to all of the conference attendees this year for your interest and enthusiasm. The conference was well attended this year, with a lot of interest in all the sessions. We hope the interest in this technology continues to grow, and that this conference will expand with even greater technical content and significance in future years.

**Dr. Edward M. Carapezza**