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

**Edward M. Carapezza**  
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## 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**