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Augustus W. Fountain III
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Introduction

This year the SPIE Defense, Security + Sensing Symposium's, CBRNE Sensing Conference had its 15th annual meeting in Baltimore, MD from 5–9 May 2014. I was especially excited this year because I was actually able to attend as Chair, after last year's ban on conference travel. Although the paper count was about 20% below what it had been the previous few years, the quality was high and the average attendance throughout the conference was on par with the SPIE overall average. This year the conference featured speakers from various government, industry, and academic institutions discussing novel techniques of detecting CBRNE threats. The conference highlighted many novel devices, experimental methods, and computational/modeling approaches, focusing on optical standoff, rather than point detection.

In Chemical Detection I & II, a series of experimentalists and computational experts discussed various laser techniques for proximal and standoff detection of threats. Notably Zhaowei Zhang from the Defense Science and Technology Laboratory (United Kingdom) discussed utilizing optical parametric oscillators (OPO) in Fourier transform infrared (FTIR) spectroscopy-based standoff detection. In addition Logan Marcus from U.S. Army Research Laboratory gave a talk on use of photoacoustic spectroscopy (PAS) ultracompact sources for standoff detection and Anish Goyal from the Massachusetts Institute of Technology Lincoln Laboratories discussed modeling the long wave IR (LWIR) reflectance signals from contaminated surfaces. Fredrik Kullander from the Swedish Defence Research Agency (FOI) discussed their work in using UV-Raman to detect chemical warfare agents.

The Explosive Detection sessions included speakers that discussed both proximal and standoff detection of energetic materials. The talks covered various detection methods and analysis algorithms. Many talks also focused on combining the specificity of Raman spectroscopy with the broad area imaging capabilities of IR HSI and other spectroscopic techniques. William Hug discussed what Photon Systems us doing to improve the sensing capabilities of current DUV Raman systems by fusing the information from fluorescence and Raman signals. James Carrier from Ondax, Inc. presented research on using low frequency Raman or "THz Raman" to obtain both structural and chemical information on explosives threats. Henric Östmark from FOI presented techniques for remote Raman imaging of post- blast scenes. These sessions and others highlighted a number of novel concepts for explosives detection applications.

Other talks focused on biological detection in environmental samples. Notably Yiping Zhao from the University of Georgia presented his research using surface enhanced Raman spectroscopy (SERS) to detect pathogens in food samples. In our smallest session, most of the radiological and nuclear detection talks focused

on development of algorithms and techniques for interpreting and analyzing data collected by detectors.

As in past years, the CBRNE Sensing Conference had a joint session with the Micro/Nanotechnologies for Lasers and Standoff Detection. Notable talks in these sessions were from Chris Kendziora of NRL who gave a talk on the creation of a mobile platform IR system. It uses a photothermal imaging approach, powered by a QCL to detect chemical threats at 30m distance in ambient outdoors conditions. Also, Seonghwan Kim from the University of Calgary (Canada) gave a talk on standoff detection of trace explosives using QCLs based on TiO_2 microcantilever sensors.

Once again I want to thank my committee who really makes this conference happen. There is no way I could review all the abstracts and proceedings papers or host all the sessions without them. I am confident that this conference remains a viable and important means of bringing the leaders in the field of CBRNE sensing from every sector: government, academia, and industry. I am already excited about next year's conference and the new developments it will report on.

Augustus W. Fountain III