Awareness and Localization of Explosives-Related Threats (ALERT)

ALERT is supported by the Department of Homeland Security (DHS) Science and Technology (S&T) Directorate through the Office of University Programs (OUP)

Advanced Development for Security Applications (ADSA) Workshop 22: Reducing Operator Cognitive Load in Aviation Security Virtual Workshop

Session 4
December 8, 2020, 11 AM - 1 PM ET

SPEAKER BIOGRAPHIES

Carl R. Crawford

Csuptwo

Carl Crawford is president of Csuptwo, LLC, a technology development and consulting company in the fields of medical imaging and explosive detection for Homeland Security. He has been a technical innovator in the fields of computerized imaging for more than thirty years. His technology has resulted in 90 U.S. Patents. Dr. Crawford was the Technical Vice President of Corporate Imaging Systems at Analogic Corporation, Peabody, Massachusetts, where he led the application of signal and image processing techniques for medical and security scanners. He developed the reconstruction and explosive detection algorithms for a computerized tomographic (CT) scanner deployed in airports worldwide. He was also employed at General Electric Medical Systems, Milwaukee, Wisconsin, where he invented the enabling technologies for helical scanning for medical CT scanners and physiological motion compensation for projection-based imaging systems. At Elscint, Haifa, Israel, he developed technology for cardiac CT scanners. He also has developed technology for magnetic resonance imaging (MRI), single photon emission tomography (SPECT), positron emission tomography (PET), ultrasound imaging, dual energy imaging and automated threat detection algorithms. He has a PHD in electrical engineering from Purdue University. He is a Fellow of the IEEE and a Fellow of the American Association of Physicists in Medicine (AAPM).

Ben Herbig

American Airlines

Ben is a Program Manager on the Security Innovation team at American Airlines, where he identifies and implements products and services critical to meeting American's security objectives. In this role, Ben serves as subject matter expert on a wide array of security technology systems, regulations, and programs, while developing and leading various internal innovation teams on enterprise programs and initiatives. Ben also serves as American's primary contact and liaison with technology solution producers and innovation teams at DHS, including TSA and CBP, on employee, passenger, and cargo screening/vetting, and facilitation initiatives.

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Bachir Kharraja

Block Engineering

Dr. Bachir Kharraja is currently SVP of Engineering and Technology at Block Engineering. He leads Research, Innovation, Products Development and Program Management functions. Under his leadership, and through Government funds and internal funds, Block has developed advanced Quantum Cascade Laser (QCL) Technology as well several commercial product offerings. Prior to joining Block Dr. Kharraja started his career as a nuclear physicist working on gamma ray spectroscopy and low energy particle physics at Louis Pasteur University - France then at the University of Notre Dame - IN. After that he spent several years leading Products Development, Program Management and Global Operations across several industries: Cell Phones/Wireless/IoT devices (Sr. Staff At Motorola), Then Artificial Intelligence and Autonomous Unmanned Robotics Systems - Ground (PM At iRobot), Underwater (Director At Bluefin Robotics), Air eVTOL (VP of Products Development At Top Flight Technologies), as well as Clean Air Technology Products (VPE At Rypos). Dr. Kharraja was also co-Founder and CEO of RoboWorx. Dr. Kharraja holds 2 Ph.Ds., a MS. and a BS. all in physics.

Michael Lanzaro

Liberty Defense

Michael Lanzaro has more than 25 years of management experience in leading large high-tech organizations with product development, research and development, marketing, and profit and loss responsibilities. He brings over 20 years of experience in the Security and Detection Industry and currently serves as the Chief Technology Officer at Liberty Defense Technologies, following the merger of the company with DrawDown Detection Inc. Liberty Defense is a provider of security solutions for concealed weapons and explosives detection in high volume foot traffic areas. Prior to joining Liberty Defense, Mr. Lanzaro spent 15 years at L3Harris, serving as the Vice President of Engineering and Technology overseeing all the technology, research and development, and engineering development for the Security and Detection Systems business. While there, he and his team successfully developed and brought to market a number of industry-leading TSA and European- approved aviation security solutions, including the millimeter-wave ProVision passenger screener, the CT-based Examiner family and fixed gantry hi-speed MV3D for the checked baggage market, as well as the first-to-market ClearScan CT scanning solution for passenger carry-on screening. Michael holds a Master of Management degree from NYU Polytechnic University, a Master of Computer Science from New York Institute of Technology, and a Bachelor of Electrical Engineering from Stevens Institute of Technology. He has been awarded eleven U.S. Patents during his career.

Vito Levi D'Ancona

Scientific Venture Partners

Vito has co-funded over 15 companies in security, communications and healthcare. Some of these exited and some are still active. Vito has an MBA from London Business School, a Engineering Degree from University of Florence and worked 10 years in designing robotics and automated machinery before becoming an entrepreneur and investor.

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Tim Lorenzen

American Airlines

Tim Lorenzen is the Manager of Security Innovation at American Airlines where he leads a team of dedicated professionals that research and implement technology solutions to the security challenges American faces. Over his 21 year career that began with America West Airlines, he has held numerous roles in the airline, including airport customer service and ground operations management, customer service policies and procedures, international facilitation, and alliance and partnerships project management.

Harry E. Martz

Lawrence Livermore National Laboratory

Harry Martz is the Director for Non-destructive Characterization Institute and a distinguished member of the technical staff at Lawrence Livermore National Laboratory. He is also Principal Investigator (PI) on Department of Homeland Security, Science and Technology, Homemade Explosives Identification, Detection and Mitigation (*HEIDM*) program. Harry joined the Laboratory to develop the area of X-ray imaging and proton energy loss computed tomography for the non-destructive inspection of materials, components, and assemblies. He received his M.S. and Ph.D. in Nuclear Physics/Inorganic Chemistry from Florida State University, and his B.S. in Chemistry from Siena Collage. Harry has applied CT to inspect one-millimeter sized laser targets, automobile and aircraft components, reactor-fuel tubes, new production reactor target particles, high explosives, explosive shape charges, dinosaur eggs, concrete and for non-destructive radioactive assay of waste drum contents. Recent R&D efforts include CT imaging for conventional and homemade explosives detection in luggage and radiographic imaging of cargo to detect special nuclear materials and radiological dispersal devices.

Celia Merzbacher

Quantum Economic Development Consortium, *SRI International*

Dr. Celia Merzbacher is the Deputy Director of the Quantum Economic Development Consortium (QED-C), a consortium that aims to enable and grow the U.S. quantum industry. QED-C is supported by the National Institute of Standards and Technology (NIST) and more than 190 industry and academic members and is managed by SRI International. Previously, Dr. Merzbacher was Vice President for Innovative Partnerships at the Semiconductor Research Corporation, a consortium of the semiconductor industry. In 2003-2008, she was Assistant Director for Technology R&D in the White House Office of Science and Technology Policy, where she oversaw the establishment and coordination of the National Nanotechnology Initiative and served as Executive Director of the President's Council of Advisors on Science and Technology. Dr. Merzbacher began her career as a materials scientist at the U.S. Naval Research Laboratory in Washington D.C. She has served as Chair of the National Materials and Manufacturing Board of the National Academies of Science, Engineering and Medicine and on the Board of Directors of ANSI.

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Matthew Merzbacher

Alameda County Community Food Bank

Dr. Merzbacher recently retired from his position as Director of Certification and Qualification at Smiths Detection. There, and before that at Morpho Detection, Matthew was responsible for detection testing across products for explosives, chemical, and radiation detection. He also served as co-chair of the ANSI standards group on image quality for CT-based explosives detection systems and chaired the NEMA DICOS Threat Detection Working Group. Matthew joined InVision Technologies in 2003 as a Research Scientist in the Machine Vision group before taking over as manager of that group. Dr. Merzbacher has a Ph.D. in Computer Science from UCLA, specializing in data mining. He has several patents on image processing for explosives detection. He spends his time in the more rewarding pursuits of hiking and volunteering at the local food bank.

Igor Novosselov

University of Washington

Dr. Igor Novosselov is a Research Associate Professor at the University of Washington, Mechanical Engineering. He received his Ph.D. from the Department of Mechanical Engineering at the University of Washington in 2006. After that, he worked as an R&D manager in a small company developing instrumentation for biological and chemical aerosol detection. In 2014 he joined the University of Washington; his group focuses on research in the areas of fluid dynamics, aerosol science, and supercritical fluids. During the last five years, under funding from DHS, his group studied forces acting on a particle in the flow boundary layer. He had developed and tested novel approaches for a non-contact surface sampling of trace explosive residues. Dr. Novosselov has 70+ peer-reviewed publications and patents. He has 14 years of experience as a PI/Lead scientist in government and industry-sponsored research, including DoD, DHS, NSF, and NIH.

Laura Parker

Department of Homeland Security

Laura Parker is the Senior Advisor for Sensors in the Science and Technology Directorate at the Department of Homeland Security. She is also the Program Manager for the ALERT Center of Excellence, a DHS-sponsored consortium of universities led by Northeastern University to perform research that address explosive threats. Laura, most recently, was the Program Manager for the Next Generation Explosives Trace Detection Program focused on developing advanced explosives trace detectors for use at checkpoints and other DHS operational environments. Laura has worked on a variety of research projects focused on explosives screening technologies to include algorithm and hardware development and interfacing with DHS components such as Transportation Security Administration, Customs and Border Protection, US Secret Service, the US Coast Guard and other government agencies. Previously, Laura worked as a contractor providing technical and programmatic support of chemical and biological defense and explosives programs for several Department of Defense (DoD) offices. She also performed research in several US Navy laboratories in the field of energetic materials. She obtained her Ph.D. in chemistry from the Pennsylvania State University.

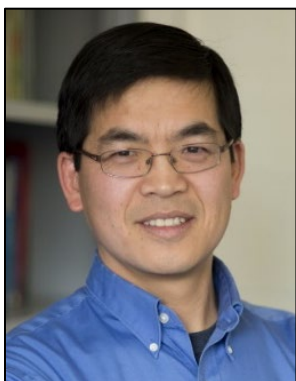**Awareness and Localization of Explosives-Related Threats (ALERT)**

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Michael B. Silevitch

Northeastern University

Michael B. Silevitch is currently the Robert D. Black Professor of Engineering at Northeastern University in Boston, an elected life fellow of the IEEE, the Director of the Homeland Security Center of Excellence for Awareness and Localization of Explosives Related Threats (ALERT), and the Director of the Bernard M. Gordon Center for Subsurface Sensing and Imaging Systems (Gordon-CenSSIS), a graduated National Science Foundation Engineering Research Center (ERC).His training has encompassed both physics and electrical engineering disciplines. An author/co-author of over 65 journal papers, his research interests include laboratory and space plasma dynamics, nonlinear statistical mechanics, and K-12 science and mathematics curriculum implementation. Prof. Silevitch is also the creator of the Gordon Engineering Leadership (GEL) Program at Northeastern University, a graduate curriculum offered through the College of Engineering, with the mission of creating an elite cadre of engineering leaders. He and the current GEL Director, Simon Pitts, were awarded the 2015 Bernard M. Gordon Prize for Engineering Education by the National Academy of Engineering (NAE).

Nian Sun

Northeastern University

Nian Sun is a professor of Electrical and Computer Engineering and professor in affiliation with Bioengineering, Director of the W.M. Keck Laboratory for Integrated Ferroics, Northeastern University, and founder and Chief Technology Advisor of Winchester Technologies, LLC. He received his Ph.D. degree from Stanford University. Dr. Sun was the recipient of the Humboldt Research Award, NSF CAREER Award, ONR Young Investigator Award, Outstanding Research Award, Outstanding Translational Research Award, etc. His research interests include novel gas sensors and systems for pathogen sensing and for the diagnosis of different diseases; novel magnetic, ferroelectric, and multiferroic materials, devices, and microsystems, etc. He has over 280 publications and over 30 patents and patent applications with an H-index of 53 on Google Scholar. One of his papers was selected as the "ten most outstanding full papers in the past decade (2001~2010) in *Advanced Functional Materials*". Dr. Sun has given over 180 plenary/keynote/invited presentations and seminars. He is a fellow of the IEEE, the Institute of Physics, and of the Institution of Engineering and Technology, and an editor of *Sensors*, and *IEEE Transactions on Magnetics,* etc.