



ALERT
AWARENESS AND LOCALIZATION
OF EXPLOSIVES-RELATED THREATS

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 23:
Autonomous Security Systems**

Session 1

May 4, 2021, 11:00 AM – 1:30 PM ET

SPEAKER BIOGRAPHIES



Frank Cartwright

Transportation Security Administration

Frank Cartwright currently serves as the Branch Manager for Capability Development & Integration (CDI) within the Requirements & Architecture Division (RAD). In this capacity Mr. Cartwright is responsible for the innovative development of the next generation of security capabilities that will be implemented across the fleet of Transportation Security Equipment under the governance of TSA. This includes capabilities (both hardware & software) used in Check-point, Checked Baggage and Cargo environments. For the past 20 years, Frank Cartwright has served the TSA in various technical capacities. As a contractor, he supported the TSL (Transportation Security Lab) with the development of technical requirements for Checked-baggage Systems. After several years developing requirements and helping to design the next generation of Checked-baggage systems, he performed similar duties for Infrastructure & Conveyance (i.e. Cargo/Intermodal). As a Federal employee, Mr. Cartwright supported the Passenger Screening Program as the Portfolio System Engineer for Carry-on-Bag screening technologies and later Passenger Screening technologies.



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).



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John M. Fortune

DHS Science and Technology (S&T) Directorate, Department of Homeland Security

Dr. John M. Fortune is the Screening at Speed Program Manager in the DHS Science and Technology (S&T) Directorate. The Screening at Speed Program is pursuing transformative R&D activities that support a future vision for increasing aviation security effectiveness and improving the passenger experience. He also leads the Screening Program Management Team in S&T's Office of Mission Capability and Support. Previously, Dr. Fortune was a Branch Chief in S&T's Resilient Systems Division, where he focused on enhancing resilience of the Nation's most critical infrastructure sectors, such as energy, transportation, water, and communications. He managed the Resilient Tunnel Project, which developed inflatable plugs to protect subway tunnels from flooding. He also oversaw several projects to assess vulnerability and design countermeasures for critical transportation infrastructure, including development of a blast protection strategy that was purchased and installed by a major U.S. mass transit agency. In his earlier work at S&T, Dr. Fortune served in the Emerging Threats Portfolio, where he oversaw a nationwide assessment of underwater subway tunnels, a high priority effort requested by the TSA Administrator, and he worked closely with the intelligence community to understand potentially disruptive threats to the Nation's security. Dr. Fortune came to DHS in 2005 as a Science and Technology Policy Fellow with the American Association for the Advancement of Science. Prior to joining DHS, Dr. Fortune was a researcher at the National Institute of Environmental Health Sciences. He holds a Ph.D. in biochemistry from Vanderbilt University and a B.S. in chemistry from Duke University.

Donald King

Amir Neeman Consulting Inc.

Donald King is a graduate from Northeastern University with a Master's Degree in Strategic Intelligence and Analysis, with concentrations in Counter-Terrorism and Human Intelligence. He has been working in the field of Aviation Security, first as a Transportation Security Officer, then as an Analyst and Data Collection Manager, since 2019. He has worked on a variety of initiatives within the Transportation Security Administration, primarily on screening technology, alongside officers at airports on a day-to-day basis. In addition to Aviation Security, he has pursued extensive independent analysis focusing on Far-Right Extremism, the radicalization process, and their propaganda.



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 College. 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.



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Matthew Merzbacher

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.



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.



Carey Rappaport

Northeastern University

Carey M. Rappaport received five degrees from the Massachusetts Institute of Technology: the SB in Mathematics, the SB, SM, and EE in Electrical Engineering in June 1982, and the PhD in Electrical Engineering in June 1987. He is married to Ann W. Morgenthaler, and has two children, Sarah and Brian. Prof. Rappaport joined the faculty at Northeastern University in Boston, MA in 1987. He has been Professor of Electrical and Computer Engineering since July 2000. In 2011, he was appointed College of Engineering Distinguished Professor. He was Principal Investigator of an ARO-sponsored Multidisciplinary University Research Initiative on Humanitarian Demining, Co-Principal Investigator and Associate Director of the NSF-sponsored Engineering Research Center for Subsurface Sensing and Imaging Systems (CenSSIS), and Co-Principal Investigator and Deputy Director of the DHS-sponsored Awareness and Localization of Explosive Related Threats (ALERT) Center of Excellence. Prof. Rappaport has authored over 425 technical journal and conference papers in the areas of microwave antenna design, electromagnetic wave propagation and scattering computation, and bioelectromagnetics, and has received two reflector antenna patents, two biomedical device patents

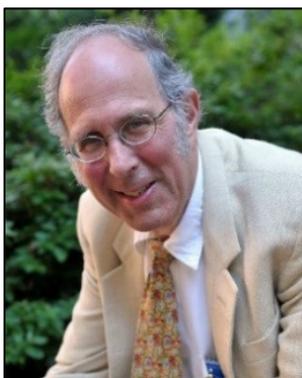


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and three subsurface sensing device patents. He was awarded the IEEE Antenna and Propagation Society's H.A. Wheeler Award for best applications paper, as a student in 1986. He is a member of Sigma Xi and Eta Kappa Nu professional honorary societies.



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).



Jay Stanley

American Civil Liberties Union

Jay Stanley is Senior Policy Analyst with the ACLU's Speech, Privacy, and Technology Project, where he researches, writes and speaks about technology-related privacy and civil liberties issues and their future. He writes for and is editor of the ACLU's "Free Future" blog, and has authored a variety of influential ACLU reports on such topics as government and private-sector surveillance, network neutrality, scientific freedom, police cameras, drones, AI, big data, and airline passenger security. Before joining the ACLU in 2001, Stanley was an analyst at the technology research company Forrester, where he focused on Internet policy issues. He is a graduate of Williams College and holds an M.A. in American History from the University of Virginia.



Kirk Yeager

Federal Bureau of Investigation

Kirk Yeager received his B.S. in Chemistry from Lafayette College and PhD in Inorganic Chemistry from Cornell University. He worked as a research scientist and Associate Director of R&D at the Energetic Materials Research and Testing Center (EMRTC). While in the Land of Enchantment he also held the position of Adjunct Professor in the New Mexico Tech chemistry department. For 10 years he served as a Physical Scientist/Forensic Examiner for the FBI Laboratory's Explosives Unit where he deployed as a bombing crime scene investigator to dozens of countries. Currently he is the FBI's Chief Explosives Scientist. Dr. Yeager has approximately 25 years of experience with improvised explosives and IED's, has presented over 200 talks at international meetings and conferences, has produced over 80 specialty publications in the area of explosives



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and IED's, to include 4 book chapters. Over the course of his colorful career he has served as a subject matter expert for the National Academies of Sciences, worked as a technical advisor for the Mythbusters, and been the subject of a feature article in Popular Mechanics. He is an avid geocacher and holds the rank of Black Belt in Dan Zan Ryu Ju-Jutsu. His academic prowess is surpassed only by his charm and humility.