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 3
May 25, 2021, 11:00 AM – 1:30 PM ET

SPEAKER BIOGRAPHIES

Tim Cargol

Spectrohm, Inc.

Tim Cargol is the founder and CEO of Spectrohm, Inc. At Spectrohm, Mr. Cargol is developing internal imaging technology that maps objects' dielectric properties to supercharge AI's ability to identify their internal composition. Spectrohm's focus on developing smart, rugged, no-contact, inexpensive devices to rapidly triage potential threats is part of Mr. Cargol's long track record of developing solutions to complex, outside-the-box challenges. Prior to founding Spectrohm, Mr. Cargol was a senior officer in the US Intelligence Community (IC), with extensive expertise in advanced weapon systems, cyber, and explosives technologies; he worked closely with colleagues across the US Government and with partner governments, led analysis of cross-cutting weapons threats, and was an instructor for IC training on threats at the nexus of technology and terrorism. Mr. Cargol is a senior member of the IEEE and earned his B.S and M.Eng. degrees in electrical engineering from MIT and conducted extensive research on dielectric materials--the science at the heart of Spectrohm's innovation--at MIT's High Voltage Research Lab before pursuing entrepreneurial opportunities in dielectrics and transmission line–based technologies. He holds 4 patents on dielectric measurement and transmission line technologies.

Morten Christensen

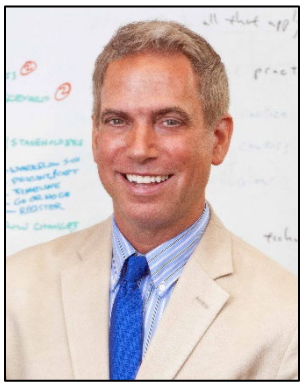
Exruptive

Morten Christensen, Ph.D has been heading the Exruptive R&D scanner program since he joined Exruptive in 2015 after a university centered career combining ultrafast X-ray science and business related activities in multiple innovation networks aimed at commercial application of X-ray, Neutron and Nano Technology.

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).



Keith Dreyer

Massachusetts General Hospital

Keith J. Dreyer, DO, PhD, FACR, FSIIM, is Chief Data Science Officer and Chief Imaging Information Officer for Mass General Brigham. He also holds the positions of Vice Chairman of Radiology, Informatics, at Massachusetts General Hospital, Chief Executive for the MGH & BWH Center for Clinical Data Science, and Associate Professor of Radiology at Harvard Medical School. He is ABR board certified in diagnostic radiology with a BS in Mathematics, MS in Image Processing, PhD in Computer Science and medical fellowships in Imaging Informatics and Magnetic Resonance Imaging from Harvard University at MGH. Dr. Dreyer is the Chief Science Officer for the American College of Radiology's Data Science Institute and has held numerous board, chair, advisory, and committee positions with the American College of Radiology, Radiological Society of North America, Society of Imaging Informatics in Medicine and numerous global healthcare corporations. He has authored hundreds of scientific papers, presentations, chapters, articles and books; lecturing worldwide on artificial intelligence, clinical data science, cognitive computing, clinical decision support, clinical language understudying, digital imaging standards, and implications of technology on the quality of healthcare and payment reform initiatives.

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.

Mike Kemp

Iconal Technology Ltd

Dr. Mike Kemp is an adviser to Iconal Technology Ltd which he founded in 2006 in Cambridge, UK. Iconal works with government organisations on new and emerging technologies for security providing technical consulting, contract research and test & evaluation services. He has worked as consultant and technical adviser to UK, European and US governments and programmes in explosives and weapons detection for urban security and aviation security. Mike has chaired and participated in several EU and NATO working groups on security topics and is a regular speaker at technical conferences.

Dr. Kemp has a degree in Physics and a PhD in Radio Astronomy from the University of Cambridge. He is a Chartered Engineer and held technical and management positions in several companies before setting up Iconal.

Brian Lewis

Noblis, Inc.

Brian Lewis is a Senior Engineer with Noblis, Inc. He currently provides technical subject matter expertise to the Department of Homeland Security, Science and Technology Directorate's Screening at Speed Program. Brian specializes in system architecture, sensor integration, and R&D strategies. He also has extensive experience in Systems Engineering throughout the research and development lifecycle. Brian earned his MBA through the University of Maryland, Robert H. Smith School of Business with a focus on entrepreneurship, innovation, and strategy. He received his bachelor's degree in Electrical Engineering and his master's degree in Engineering Management from Duke University. He is a certified Project Management Professional, Scrum Master, and Innovation Practitioner.

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.

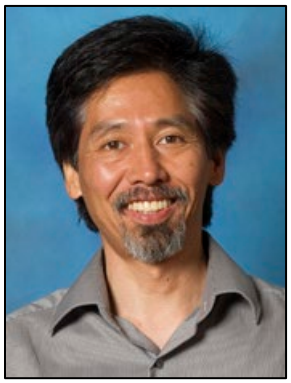
Harry E. Martz

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.

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.



Robert M. Nishikawa

University of Pittsburgh

Robert M. Nishikawa received his B.Sc. in physics in 1981 and his M.Sc. and Ph.D. in Medical Biophysics in 1984 and 1990, respectively, all from the University of Toronto. While at the University of Chicago, he developed computer-aided diagnosis systems for classifying and detecting clustered calcifications in mammograms. He has 7 patents on CAD-related technologies. He is currently a Professor and directory of the Imaging Research group in the Department of Radiology at the University of Pittsburgh. His research interests are in computer-aided diagnosis, breast imaging, radiomics, image quality assessment and evaluation of medical technologies. He has won 24 awards including two for “best” paper, two innovation awards, and one teaching award. He has over 200 publications in breast imaging. He is a fellow of the American Association of Physicists in Medicine, the Society of Breast Imaging, the College of American Institute for Medical and Biological Engineering (AIMBE), the International Society for Optics and Photonics (SPIE); and he is a Distinguished Investigator, Academy of Radiology Research. He has been a consultant for numerous medical imaging companies on digital imaging and computer-aided diagnosis.

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)

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 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).

Michelle Weinberger

Noblis, Inc.

Michelle Weinberger is a physicist with Noblis, Inc. She currently supports the Department of Homeland Security Science and Technology Directorate's Screening at Speed Program. Michelle specializes in X-rays, their application to imaging and diffraction, and technology strategy for development and transition of related technologies to homeland security operations. She has extensive experience supporting development and characterization of both large-scale X-ray imaging systems (e.g. for cargo containers) and smaller systems for aviation security applications, systems for detecting radiological and nuclear material. Michelle earned her BA in Chemistry from the University of Pennsylvania and her Ph.D. in Physical Chemistry from the University of California, Los Angeles.