Be sure to check inside the front cover for your Pocket Guide.
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## I/ITSEC 2020
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- Call for Papers and Tutorials  
- Serious Games Showcase & Challenge
CONFERENCE WELCOME

On behalf of the United States Air Force, this year’s Lead Service; our sponsoring organization, the National Training and Simulation Association; the Service Executives and their Principals; and the 200+ military, government, industry, and academia volunteers, it is my distinct honor and great pleasure to welcome you to the 2019 Interservice/Industry Training, Simulation, and Education Conference (I/ITSEC)!

This year’s theme, Winning the War of Cognition by Pushing Readiness and Lethality Boundaries, emphasizes the need to improve, enable, and quickly acquire technological advancements to better protect our Armed Forces, better prepare our warfighters, and save the lives of our military and first responders in an increasingly complex threat environment. In order to reap the readiness and performance benefits of a technological transformation of unprecedented magnitude, we must embrace new technology, overcome stagnation, deploy assets quickly, and address the ethical implications of our new resources. The I/ITSEC community has answered the call as evidenced by the innovative and diverse venues in this year’s program and on the tradeshow exhibit floor, facilitating information and idea sharing to enable attendees to explore, discuss, interact and acquire technologies across industries like cyber, medical, transportation, energy, and more. The new Air Force Pitch Day, a first for I/ITSEC, is a novel approach to award small businesses with contracts to rapidly develop innovative solutions to evolving training needs, through the application of emerging technologies.

I/ITSEC 2019 features content-rich professional development and educational activities including tutorials, paper presentations, and workshops in which attendees will have the opportunity to learn about the latest training and simulation trends, practices, and technologies. The volunteer members of our six Subcommittees, Tutorial Board, and Conference Committee spent this past year assembling a great program consisting of 125 technical papers, 41 special events, and 18 tutorials. I/ITSEC also provides fantastic opportunities to engage with our future leaders via the many STEM activities, the Future Leaders Pavilion, Student Tours, and the Serious Games Showcase and Challenge. Interaction with these young leaders will not only help expose them to future possible careers, but also enhance your personal engagement with our community. The Black Swan event, which explores challenging issues and their consequences, will focus on Artificial Intelligence (AI) in a conversation called “Deep Fake Videos and the Insider Threat.” Black Swan attendees will observe AI from perspectives which are guaranteed to test their perception of what is real and what is not. All Monday tutorials, Friday workshops, and paper sessions are available for continuing education and continuous learning credits. Additional information regarding registration for these credits is available at www.iitsec.org.

Make time to explore the I/ITSEC exhibit hall, which hosts the largest display of training systems capabilities in the world. Over 500 exhibitors will present leading-edge technology and innovative concepts. With continued growth in the number of international attendees, over 1,800 attendees from over 50 countries are expected, providing an audience with diverse ideas and perspectives. Be sure to take advantage of the many opportunities to network and exchange ideas.

This conference is a reality because of our many volunteers and sponsors. I want to express my sincere appreciation to the I/ITSEC family, as their commitment and support ensures I/ITSEC remains the world’s premier professional development event for the training, simulation, and education professional.

With the theme, Winning the War of Cognition by Pushing Readiness and Lethality Boundaries, I/ITSEC is the premier venue to observe, learn, and discuss the application of innovative technologies in training and learning environments. Whether you are an engineer, educator, trainer, system developer, or business developer, I know you will enjoy experiencing the most advanced, cutting-edge technologies and best practices in the field and leave with the inspiration to transform the world.

Sincerely,

Jennifer Arnold
**Service Keynote**

**GENERAL STEPHEN W. “SEVE” WILSON** is Vice Chief of Staff of the U.S. Air Force, Arlington, Virginia. As Vice Chief, he presides over the Air Staff and serves as a member of the Joint Chiefs of Staff Requirements Oversight Council and Deputy Advisory Working Group. He assists the Chief of Staff with organizing, training and equipping of 685,000 active-duty, Guard, Reserve and civilian forces serving in the United States and overseas.

Gen. Wilson received his commission from Texas A&M University in 1981. He’s had multiple flying tours and led bomber, intelligence, surveillance and reconnaissance, mobility, aeromedical evacuation and airborne command and control operations supporting operations Iraqi Freedom, Enduring Freedom and Combined Joint Task Force-Horn of Africa. General Wilson has also held numerous command positions, including the Joint Functional Component Commander for Global Strike and Air Force Global Strike Command.

General Wilson is a command pilot with more than 4,500 flying hours and 680 combat hours. Prior to his current assignment, the General was Deputy Commander, U.S. Strategic Command, Offutt Air Force Base, Nebraska.

**Industry Keynote**

**MARK MATTHEWS** is the President of Quantum3D Government Systems (GS), responsible for leading the military-focused business area to define and implement new strategies to grow the U.S. Government and International business. Quantum3D Government Systems, together with its sister company Quantum3D Inc., has built a reputation of providing training and simulation technologies, integrated solutions, systems engineering services, specialized R&D, system integration and custom solutions to meet the rigorous demands for both government and commercial customers worldwide. Both business areas bring the “Power of Prepared” thru Quantum3D’s MANTIS training simulation software and Image Generator (IG) products, which have been distributed worldwide for over 20 years.

Prior to his current role, Mr. Matthews had program management and business area responsibility for Boeing’s P-8 Acoustics Programs from 2009 – 2018, where he led a large multi-functional team to design, manufacture, test and deliver an acoustic processing system to the U.S. Navy for the new P-8 submarine hunting platform. In addition, he managed a large portfolio of both domestic and international programs using acoustic detection capabilities.

From 2004 to 2009, Mark was the Deputy Director for International Programs at BAE Systems, where he was responsible for development, manufacturing, test, training and technical support for various avionics, control sticks, mission computers, flight displays and test equipment as well as all aspects of program management including strategy, customer relationships, cost, schedule, policies and procedures.

Mr. Matthews has also held program management and operations management roles with Space Vector, Rockwell International and Ford Aerospace. In these leadership roles, he was responsible for design, development, manufacturing, test and field tests for major platforms such as ICBM, Rail Garrison, Sidewinder missile systems and the U.S. Army HERA target systems.

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**Opening Ceremonies**

**Tuesday • 0830-1000**

- Call to Order
- Presentation of Colors
- National Anthem
- Invocation
- Opening Remarks
  - Brian Holmes, 2019 Conference Chair
- Service and Industry Keynotes

**Senior Leader Panel**

**Tuesday • 1030-1200**

- Fred Drummond, SES
- Vice Admiral DeWolfe Miller, III, USN
- Major General James A. Jacobson, USAF
- Major General William F. Mullen, USMC
- Brigadier General Stephen Michael, USA
- Brigadier General Ilamrs Lejins, NATO
BRIAN J. HOLMES is Quantum3D Government Systems’ Vice President of Business Development, where he leverages his extensive experience in a wide range of disciplines to develop innovative solutions for both his military and commercial clients. Brian’s experience includes working with entire departments, teams, small groups and individuals, at every level in an organization, from Boards of Directors and upper management to support staff. Brian has held positions as Project Engineer, Systems Engineer, Lead Engineer, Project/Program Manager, Capture Manager, Proposal Manager, Director of Operations and Vice President during his 31+ years in the Modeling, Simulation and Training (MS&T) Industry. Brian’s journey in MS&T began at the University of Central Florida where he graduated with a Bachelor of Science degree in Electrical Engineering in 1988 and accepted a position with the Naval Training Systems Center (NTSC, now NAVCTSD). After 5 years at NTSC, Brian accepted a position as a Lead Systems Engineer at the former Simulation and Instrumentation Command (now the Program Executive Office for Simulation, Training and Instrumentation). During his time within the government acquisition commands, he also pursued and completed a Master of Science degree in Industrial Engineering from the University of Central Florida, with an emphasis in simulation and training. Brian has been an active participant on I/ITSEC Subcommittees since 2010, including Chairman of the Simulation Subcommittee in 2014. Brian currently serves as the Treasurer and member of the Board of Directors of Fairways for Warriors.

JENNIFER ARNOLD is a Principal with Booz Allen Hamilton with over 25 years of experience in the Simulation and Training industry and has been recognized for her award-winning contributions to Defense, Intelligence, Federal, and Commercial clients. She is the business development lead for the Firm’s Strategic Innovation Group focused on driving Immersive, Data Science and Machine Intelligence (DS&MI), Cyber, and Digital technologies to support strategic planning, pipeline/portfolio development, and strategic level captures. Prior to joining the Firm, she built and managed a Performance Improvement organization with specialized expertise in mission-related systems integration, training, education, and strategic organizational transformation. She holds an M.A. in Industrial Organizational Psychology from St. Mary’s University and a B.A. in Psychology from Texas Tech University. She currently serves on the Board of Directors for the Camaraderie Foundation, an organization committed to helping our Veterans and First responders battling post-traumatic stress and other “invisible” wounds of war. Jennifer has served as an active member on I/ITSEC Subcommittees and Conference Committee for 15 years.

Following graduation from Rensselaer Polytechnic Institute, designation as a Naval Aviator and training in the F-14 Tomcat, Admiral Robb deployed nine times across the globe accumulating over 5,000 hours and 1,000 carrier landings. Following a tour flying Russian fighters in the Nevada desert, he commanded Fighter Squadron Fifty One, Carrier Air Wing Nine, the Navy Fighter Weapons School (TOPGUN) and Carrier Strike Group Seven. As a Flag Officer he managed all Naval Aviation Programs (N980) and was the Director of Navy Readiness (N43). Following 9/11, he joined USCENTCOM as the Director of Plans (J5), deploying to the Middle East in support of combat operations. Retiring in 2006, he built a successful small consulting business before joining the National Training and Simulation Association as President in June 2012.

Herbert J. “Hawk” Carlisle became president and chief executive officer of the National Defense Industrial Association (NDIA) June 15, 2017. Gen. Carlisle came to NDIA after a 39-year career in the Air Force, from which he retired as a four-star General in March 2017. His last assignment was as Commander, Air Combat Command at Langley Air Force Base in Virginia. Before that, Gen. Carlisle was the commander of Pacific Air Forces; the air component commander for U.S. Pacific Command; and executive director of Pacific Air Combat Operations staff, Joint Base Pearl Harbor in Hawaii. Gen. Carlisle has served in various operational and staff assignments throughout the Air Force and commanded a fighter squadron, an operations group, two wings and a Numbered Air Force. He was a joint service officer and served as Chief of Air Operations, U.S. Central Command Forward in Riyadh, Saudi Arabia. During that time, he participated in Operation Restore Hope in Somalia.

Carlisle was chief of air operations for U.S. Central Command. He also served as Commander, Air Combat Command, Joint Base Langley-Eustis, Virginia. The Air Combat Command is part of the U.S. Air Force and the military’s air component, serving as the nation’s air advantage provider. Prior to his most recent assignment, Carlisle was the commander of Pacific Air Forces from July 5, 2015 to April 10, 2017, following three years as chief of staff, U.S. Central Command.

The Air Combat Command is the nation’s air advantage provider, including the air component of U.S. Army Forces Central Command, U.S. Special Operations Command and U.S. Southern Command. It is responsible for planning, executing and overseeing the operations of U.S. forces in the air, space and cyberspace. The Combat Command’s operational mission is to provide joint forces the air, space and cyberspace dominance to achieve a decisive advantage for U.S. armed forces and our allies and partners.

Brian currently serves as the Treasurer and member of the Board of Directors of Fairways for Warriors.
Air Force Service Executive (Lead Service)

COL. PHILIP E. CARPENTER, USAF, is the Senior Materiel Leader, Simulators Program Office. He leads a 500+ member team, executes a $5.8B portfolio and is responsible for developing and maintaining 60+ training systems for ACC, AMC, AETC, AFOSI, AFSC and multiple FMS partner nations. He enlisted in the Air Force in 1986 and served as an avionics technician on the SR-71 and a communications systems operator on EC-130 and EC-135 aircraft. He was commissioned in 1995 through Air Force Officer Training School and has held a variety of program management positions in space, intelligence, command and control, cyber and weapons. As a company grade officer, he served as a C-5 and KC-10 aircraft maintenance officer. He deployed in support of Operation Iraqi Freedom and was named the 60th Air Mobility Wing Maintenance Support Officer of the Year. Col. Carpenter served as the Chief of Acquisition Officer Assignments at the Air Force Personnel Center and completed a joint tour with U.S. Forces, Japan. During this assignment, he served as an Operations Officer, Combat Ops and Exercises; Chief, Integrated Air and Missile Defense; and Executive Officer to the Commander. He also participated in Operation Tomodachi following the devastating 9.0 earthquake and tsunami. Col. Carpenter was the Materiel Leader for AM-120 development and, most recently, he was the Chief, F-16 Foreign Military Sales, where he managed a $23B portfolio to produce and modify over 750 aircraft for 10 nations. Col. Carpenter holds an APDP Level III in Program Management and is a Level II Credentialed Space Professional.

Army Service Executive

BG MICHAEL E. SLOANE, USA, is the Program Executive Officer, Simulation, Training and Instrumentation (PEO STRI) in Orlando, Florida. PEO STRI is responsible for a multi-billion dollar program annually. Previously, he served as the Assistant Program Executive Officer Enterprise Information Systems as well as the Chief of Staff to the Acting Assistant Secretary of the Army (Acquisition, Logistics and Technology). His operational assignments include platoon leader and company executive officer in the 24th Infantry Division (Mechanized), deploying for Operations Desert Shield and Desert Storm, as well as to Honduras for Joint Task Force 105 and to support Hurricane Andrew relief operations. After a break in active duty service, he served in the 10th Mountain Division (Light Infantry) as the Division Support Command S4 and as a company commander, deploying to the Balkans with the NATO-led multinational peacekeeping force. His subsequent assignments included Recent Readiness and Assignment Officer, Human Resources Command; the Missile Defense Agency’s Ter-

minal High Altitude Area Defense (THAAD) System Project Office as the Assistant Product Manager for Missile Development and later as Assistant Product Manager for THAAD System Test and Evaluation; the Office of the Deputy Chief of Staff, G-1 as the lead Personnel Policy Integrator for the Acquisition, Chaplain and Judge Advocate General Corps; PEO Soldier as the Product Manager for Soldier Clothing and Individual Equipment and as the Project Manager for Soldier Sensors and Lasers.

Navy Service Executive

CAPT TIMOTHY M. HILL, USN, is the Commanding Officer, Naval Air Warfare Center Training Systems Division (NAWCTSD) and Naval Support Activity (NSA), Orlando. NAWCTSD is the Navy’s principal center for modeling, simulation and training systems technologies. The command provides training solutions and research for a wide spectrum of military programs, including aviation, surface and undersea warfare and other specialized requirements. Captain Hill leads a workforce of 1,200 scientists, evaluators, engineers, technicians, logisticians, contracting specialists and support personnel. Captain Hill was commissioned with the U.S. Naval Academy Class of 1992 after earning a Bachelor of Science degree in Systems Engineering. As a Naval Flight Officer, Captain Hill has logged over 3,200 flight hours and 750 carrier arrested landings in 32 different aircraft models, with operational flying tours in the S-3B Viking and the F/A-18F Super Hornet. He also served various staff and acquisition program management roles. Captain Hill served as the Executive Officer for NAWCTSD for two and a half years prior to assuming command in November 2018. His awards include the Legion of Merit, Bronze Star Medal, 2 Defense Meritorious Service Medals, Meritorious Service Medal, 2 Strike Flight Air Medals, along with other personal awards and numerous campaign medals and unit citations.

Marine Corps Service Executive

COL. “LOU” LARA is the Marine Corps Systems Command Program Manager, Training Systems (PM TRASYS). He is responsible for managing a workforce of over 150 personnel in the acquisition and sustainment of training systems used throughout the Marine Corps. Col. Lara graduated from Embry Riddle Aeronautical University in 1993 with a B.S. in Aviation Maintenance Management. He also holds M.S. Degrees in Acquisition and Contract Management from the Naval Post-Graduate School and Military Studies from the Marine Corps University. He earned a commission in 1995 and subsequently became a Logistics Officer and a Contracting Officer. In 1999, he deployed on a Western Pacific deployment as a member of the 11th Marine Expeditionary Unit. Additionally, in support of the Global War on Terror, he deployed three times to Kuwait/Iraq, twice as a Contingency Contracting Officer and once as the Regimental Combat Team - 5 Logistics Officer in support of combat operations in Fallujah. Prior to his selection as Program Manager Training Systems, Col. Lara served as the Deputy Program Manager for Training Systems, and completed a fellowship as a Secretary of Defense Executive Fellow at Georgia Power Company. Other key Acquisition Officer assignments include, Acquisition Command as Product Manager for Anti-Armor Systems, Deputy Director for the Amphibious Combat Vehicle (ACV), Assistant Program Manager Logistics for the Expeditionary Fighting Vehicle (EFV), Team Leader for the Body Armor and Load Bearing team and Director of Contracts at Marine Corps Support Facility, Blount Island Command. His personal decorations include the Bronze Star, the Meritorious Service Medal with three gold stars in lieu of fourth award, the Navy and Marine Corps Commendation Medal and the Navy and Marine Corps Achievement Medal. Additionally, he is a recipient of the Combat Action Ribbon.

Senior Advisor for Readiness and Training

GREGORY KNAPP supports the U.S. Army Threat Systems Management Office (TSMO), the Office of the Under Secretary of Defense for Research and Engineering and the Office of the Under Secretary of Defense for Personnel and Readiness performing program management, technology and acquisition functions. He provides leadership and expertise in DoD 5G implementation, spectrum research and EW programs, coalition training programs, training infrastructure, and a wide variety of DoD training and technology issues including the air combat training system (ACTS). He provided critical support for the fielding of the Defense Readiness Reporting System and the conduct of the SecDef Nuclear Review. He served as the Vice Deputy Director for Future Joint Force Development, J7, Joint Staff, overseeing Operational Analysis, Chairman’s Wargaming, Doctrine Development, Joint Concepts and Experimentation. He was also the Executive Director of the Joint Warfighting Center supporting USJFCOM and was instrumental in establishing the Joint National Training Capability and the Combatant Command Engagement and Training Transformation Program. Mr. Knapp has been a leader in training and technology for over 30 years, leading the development of numerous combat systems, combat system training systems and Navy test programs and is widely recognized as a leader in distributed simulation training technology implementation. He has managed over 50 programs affecting all Combatant Commands, Services, Interagency and Coalition partners.
Service Principals

Tony DalSasso  
**Air Force (Lead Service)**  
Engineering Technical Advisor  
Simulators Program Office, Air Force Materiel Command (AFMC)

Diana Teel  
**Navy**  
Outreach Director / Chief Evangelist  
Naval Air Warfare Center Training Systems Division (NAWCTSD)

Jesse Campos  
**Army**  
PM Cyber, Test, and Training, Chief Engineer  
U.S. Army Program Executive Office, Simulation, Training and Instrumentation (PEO STRI)

Koren L. Odermann  
**Marine Corps**  
Team Lead for Collective Training, Marine Corps Systems Command (MARCSSYSCOM) Program Manager, Training Systems (PM TRASYS)

OSD Principal

Walter (Shep) Barge, Ph.D.  
Director  
Joint Integrated Operations and Training, Office of the Deputy Assistant Secretary of Defense for Force Education and Training

Education and Training Advisor

VADM Al Harms, USN (Ret.)  
President  
Lake Highland Preparatory School
Agenda
### Dress Code

<table>
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<tr>
<th>BRANCH</th>
<th>CONFERENCE AND GENERAL SESSIONS</th>
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<tr>
<td>Army</td>
<td>ACUs or Duty Uniform</td>
<td>Army Blue <em>(Army Evening Mess Optional)</em></td>
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<td>Marine Corps</td>
<td>Service “C”</td>
<td>Evening Dress <em>(Dress Blue “B” or Service “A” Optional)</em></td>
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<td>Service Khaki, Navy Service Uniform</td>
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<td>Air Force</td>
<td>Blues <em>(Short or Long Sleeve)</em></td>
<td>Mess Dress or Semi-Formal</td>
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<td>Coast Guard</td>
<td>Tropical Blue Long</td>
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<td>Civilian</td>
<td>Business Attire</td>
<td>Black Tie <em>(Optional)</em> or International Traditional Costume</td>
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### Pre-Conference Agenda

#### Wednesday, 27 November 2019

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<th>TIME</th>
<th>EVENT</th>
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<tr>
<td>0800</td>
<td>Exhibitor Registration Open</td>
<td>South Concourse, S220CDE</td>
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#### Thursday, 28 November 2019

CLOSED FOR THANKSGIVING

#### Friday, 29 November and Saturday, 30 November 2019

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<td>Exhibitor Registration Open</td>
<td>South Concourse, S220CDE</td>
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#### Sunday, 1 December 2019

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<td>0800</td>
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<td>South Concourse, S220CDE</td>
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<td>1200</td>
<td>Conference Registration Open</td>
<td>South Concourse, S220CDE</td>
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<td>1200</td>
<td>Satellite Registration Open</td>
<td>Hyatt Regency Main Lobby</td>
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<td>1800</td>
<td>All Registrations Close</td>
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<tr>
<td>TIME</td>
<td>LOCATION</td>
<td>TIME</td>
</tr>
<tr>
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</tr>
<tr>
<td>0700</td>
<td>Conference and Exhibit Registration Open</td>
<td>South Concourse, S220CDE</td>
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<tr>
<td>0730</td>
<td>Satellite Registration Open</td>
<td>Hyatt Regency Main Lobby</td>
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<tr>
<td><strong>0830 - 1000</strong></td>
<td><strong>TUTORIALS</strong> (Synopses begin on page 50)</td>
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<tr>
<td>A Comprehensive Introduction to Medical Simulation</td>
<td>1910</td>
<td>Room S320B</td>
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<td>Live, Virtual and Constructive (LVC) Simulation Interoperability 101</td>
<td>1931</td>
<td>Room S320C</td>
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<tr>
<td>TENA/JMETC: Live-Virtual-Constructive Integration for Test and Training</td>
<td>1928</td>
<td>Room S320D</td>
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<td>Cybersecurity in LVC</td>
<td>1917</td>
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<tr>
<td>Introduction to DoD Modeling and Simulation (M&amp;S)</td>
<td>1923</td>
<td>Room S320F</td>
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<tr>
<td>An Introduction to Cognitive Systems for Modeling &amp; Simulation</td>
<td>1914</td>
<td>Room S320GH</td>
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<tr>
<td><strong>1030 - 1200</strong></td>
<td><strong>SIGNATURE EVENT 1:</strong> Congressional Modeling and Simulation Event (page 15)</td>
<td><strong>1030 - 1200</strong></td>
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<td>M&amp;S Case Study Analysis: Design for Additive Manufacturing &amp; 3D Printing</td>
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<td>Distributed LVC Event Integration and Execution Process</td>
<td>1911</td>
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<td>Distributed Interactive Simulation (DIS) 101</td>
<td>1937</td>
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<td>Risk Management Framework: Cyber Security Compliance for Modeling, Simulation and Training Systems</td>
<td>1939</td>
<td>Room S320E</td>
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<td>Addressing the Challenges of Rigorous Simulation Validation</td>
<td>1941</td>
<td>Room S320F</td>
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<td>Artificial Intelligence: Past, Present, Capabilities and Limitations</td>
<td>1919</td>
<td>Room S320GH</td>
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<td><strong>1400</strong></td>
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<tr>
<td><strong>1430 - 1600</strong></td>
<td><strong>TUTORIALS</strong> (Synopses begin on page 56)</td>
<td><strong>1430 - 1600</strong></td>
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<td>Location, Location, Location: Big Data, Artificial Intelligence and Analytics in the Cloud</td>
<td>1936</td>
<td>Room S320B</td>
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<tr>
<td>A Functional Approach to Distributed Network Architectures for LVC</td>
<td>1922</td>
<td>Room S320C</td>
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<tr>
<td>Introduction to HLA</td>
<td>1916</td>
<td>Room S320D</td>
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<tr>
<td>Simulation Conceptual Modeling Theory and Use Cases</td>
<td>1943</td>
<td>Room S320E</td>
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<tr>
<td>Design of Experiments: Applications for the Simulation Profession</td>
<td>1918</td>
<td>Room S320F</td>
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<td>Superforecasting: Proven Practices for Leveraging Human Ingenuity</td>
<td>1921</td>
<td>Room S320GH</td>
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<tr>
<td><strong>1600 - 1730</strong></td>
<td><strong>SIGNATURE EVENT 2:</strong> I/ITSEC Fellow 2019 (page 16)</td>
<td><strong>1600 - 1730</strong></td>
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<td><strong>1800</strong></td>
<td>Exhibits Close</td>
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<tr>
<td><strong>1800</strong></td>
<td>All Registration Stations Close</td>
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</table>
**TIME** | **LOCATION**
---|---
0700 | Conference and Exhibit Registration Open South Concourse, S220CDE
0700 | Satellite Registration Open Hyatt Regency Main Lobby

**0830 - 1000 OPENING CEREMONIES**

**Call to Order**
**Presentation of Colors**
**National Anthem**
**Invocation**

**OPENING REMARKS**
Brian Holmes, 2019 Conference Chair

**KEYNOTE ADDRESSES**

<p>| | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>General Stephen W. Wilson</td>
<td>Vice Chief of Staff of the United States Air Force</td>
</tr>
<tr>
<td>Mark Matthews</td>
<td>President Quantum3D Government Systems</td>
</tr>
</tbody>
</table>

**1030 - 1200 SIGNATURE EVENT 3: Senior Leader Panel** (page 17)

**1200**

**Exhibits Open**

**1200 - 1330**

**Lunch** (Opening of Exhibits and Lunch will occur at 1200 or upon adjournment of the General/Flag Officer Panel)

**1230**

**1200 - 1330**

**FOCUS EVENT 2: Best from Around the Globe** (page 28)

**1400 - 1530**

**FOCUS EVENT 3: Acquisition Agility** (page 29)

**1400 - 1530**

**FOCUS EVENT 4: Ignite!** (page 30)

**1400 - 1530**


**1400**

**LAUNCH PAD: Using Artificial Intelligence Technology and Personalized Services for Optimized Dynamic Language Teaching and Learning**

**1430**

**LAUNCH PAD: An App-based Approach for Reliably and Efficiently Bringing Users to Fluency in a New Language**

**1600 - 1730**

**SIGNATURE EVENT 5: 5G – From Hype to Reality** (page 19)

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**FOCUS EVENT 5: Big Data in Training** (page 31)

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**COMMUNITY OF INTEREST 2: The European Perspective on Battelabs and the Role of Simulation** (page 40)

**1600 - 1730**

**PROGRAM BRIEF 1: Air Force Acquisition Update** (page 44)

**1600**

**LAUNCH PAD: Using Artificial Intelligence Technology and Personalized Services for Optimized Dynamic Language Teaching and Learning**

**1600**

**LAUNCH PAD: An App-based Approach for Reliably and Efficiently Bringing Users to Fluency in a New Language**

**1600**

**LAUNCH PAD: One World SDK for Unity**

**16:00**

**Satellite Registration Stations at Hyatt Close**

**1630**

**LAUNCH PAD: Physically Based Night Vision Goggle Sensor Simulation in Game Engine**

**1700 - 1830**

**Exhibitor Networking Event**

**1800**

**Convention Center Registration Closes**

**1800**

**Senior Leaders Networking Hour and M&S Awards Dinner** *(invitation only)*

**1830**

**Exhibits Close**
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### Thursday, 5 December 2019

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| 1415     | Future Leaders Awards Ceremony                                       | Innovation Showcase Booth 2588|
| 1500     | Exhibit Hall and Registration Close                                 | Exhibit Hall                  |
| 1800     | Hosted Reception sponsored by Lockheed Martin                      | Hyatt Regency Windermere Ballroom|
| 1900     | Conference Awards Banquet                                            | Hyatt Regency Windermere Ballroom|

#### Reception & Awards
- Best Paper Award presentation
- I/ITSEC 2019 Scholarship Presentations
  - RADM Fred Lewis Postgraduate Scholarships
  - Leonard P Gollobin Postgraduate Scholarships
  - Barbara McDaniel Undergraduate Scholarships
- Passing of the Flag for I/ITSEC 2020
- Post Dinner Entertainment and Networking

### Friday, 6 December 2019

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<td>PDW1.1: Cyberspace Training: Is This Even Legal?</td>
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<td>PDW1.2: Blockchain in Simulation: Managing Innovations in Training, Games, Health and IoT</td>
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South Concourse

Although the buildings are large, a five-minute walk will take you...
- from the South Concourse to the North Concourse
- from the South Concourse to the Hilton
- from the South Concourse to the Hyatt Regency
- from the South Concourse to the Rosen Center

LEVEL 2 (Entry / Registration / Exhibit Hall)

LEVEL 3 (Tutorials / Presentations / Events / Practice Rooms / Professional Development Workshops)
Special Events
Congressional Modeling and Simulation Event

SELECT MEMBERS OF CONGRESS WILL PARTICIPATE IN THIS I/ITSEC EVENT

MONDAY, 2 DECEMBER
1030 – 1200 • ROOM S330BCD
SE1

This special event invites everyone attending the conference or exposition to hear from the training and simulation leaders in Congress. It is also a great opportunity for you to interact with Congressional Members on issues of importance to you or your company and to impress upon them your priorities. With defense budgets constantly in flux, this forum provides you an opportunity to advocate for the value of training and simulation in support of national security. Attendees will hear from the leadership of the Modeling and Simulation Congressional Caucus on their perspective of the situation in Washington and have the opportunity to make their case for timely investments in modeling and simulation. With every budget dollar being scrutinized, strong advocacy for training and readiness has never been more important. This event is always standing room only, so get there early.

The following members of Congress have been invited to address the M&S Community at I/ITSEC:

Bobby Scott*
Caucus Co-Chair
Virginia 3rd District

Stephanie Murphy*
Caucus Co-Chair
Florida 7th District

John Rutherford*
Caucus Co-Chair
Florida 4th District

Martha Roby*
Caucus Co-Chair
Alabama 2nd District

Robert Aderholt*
Alabama 4th District

Jack Bergman
Michigan 1st District

Gus Bilirakis*
Florida 12th District

Mo Brooks*
Alabama 5th District

John Carter*
Texas 31st District

Steve Cohen*
Tennessee 9th District

Mike Conaway*
Texas 11th District

John Cornyn
Texas

Ted Cruz
Texas

Duncan Hunter
California 50th District

Tim Kaine
Virginia

Doug Lamborn*
Colorado 5th District

Elaine Luria
Virginia 2nd District

Ed Markey
Massachusetts

Susan Davis*
California 53rd District

Dianne Feinstein
California

Virginia Foxx*
North Carolina 5th District

Scott Peters*
California 52nd District

Bill Posey*
Florida 8th District

Robert Wittman*
Virginia 1st District

Marco Rubio
Florida

C.A. Dutch Ruppersberger*
Maryland 2nd District

Mark Warner
Virginia

Elizabeth Warren
Massachusetts

Joe Wilson*
South Carolina 2nd District

Robert Wittman*
Virginia 1st District

*denotes members of the Congressional M&S Caucus

The Congressional panel addresses the audience and visits the exhibit floor during I/ITSEC.
About the 2019 Fellow

Richard Fujimoto is a Regents’ Professor in the School of Computational Science and Engineering at the Georgia Institute of Technology. He received a Ph.D. from the University of California at Berkeley in 1983. Prior to this, he received an M.S. degree from the same institution and two B.S. degrees from the University of Illinois at Urbana-Champaign.

He has been an active researcher and educator in the parallel and distributed simulation field and has devoted his career to this subject. He has authored or co-authored hundreds of technical papers on this topic, including seven award-winning publications and three books, one devoted entirely to parallel and distributed simulation systems. He led the development of parallel and distributed simulation software systems, including the Georgia Tech Time Warp (GTW) simulation executive and the Federated Simulation Development Kit (FDK). He has given numerous keynote addresses and tutorials on parallel and distributed simulation at leading conferences. He led the definition of the time management services for the High Level Architecture for Modeling and Simulation standard (IEEE 1516). Fujimoto has served as Co-Editor-in-Chief of the journal Simulation: Transactions of the Society for Modeling and Simulation International, as well as a founding area editor for ACM Transactions on Modeling and Computer Simulation.

He has led in the organization of many modeling and simulation conferences, notably the PADS conference over the last thirty years. He was the founding Chair of the School of Computational Science (CSE) at Georgia Tech, among the first academic units of its kind focused on the discipline concerned with computer-based models of natural and engineered systems. In this role, he led the creation of the Ph.D. and M.S. degree programs in CSE as well as two undergraduate minors. He is a recipient of the ACM Distinguished Contributions in Modeling and Simulation Award for his accomplishments in the parallel and distributed simulation field.

Come See the I/ITSEC Fellow Presentation

Parallel Discrete Event Simulation: Past, Present and Future

Richard Fujimoto, Ph.D., focused his I/ITSEC Fellows paper on his personal views of the origins and development of the Parallel Discrete Event Simulation (PDES) field, as well as directions for future development. In presenting the early history of PDES, Richard tells of two distinct solutions to attack the time synchronization problem. The solutions developed were quite different since the application contexts in which they were applied dictated opposite approaches. He then discusses efforts to evaluate the performance of the competing camps, known as conservative and optimistic synchronization. Richard led the effort to define the time management services for the High Level Architecture (HLA), integrating both conservative and optimistic synchronization approaches. His legacy with this work ensures time stepped, real-time, and event-driven simulations can interoperate temporally within a federation. He concludes his paper and presentation by discussing commercialization efforts as well as future research in PDES, paying particular attention to updated computing platforms.
Global forces continue to be challenged by erratic budgets and complex threats. Services continue to prepare for a wide array of missions that range from disaster assistance to the return of great power competition. Additionally, Nations continue to deal with the opportunities and challenges of accelerating technology and cybersecurity. Our Senior Officer panel will address current and future environments within the context of this year’s conference theme, “Winning the War of Cognition by Pushing Readiness and Lethality Boundaries”. This year’s panel will include senior representatives from OSD, all U.S. Military Services and NATO. Following opening remarks, the audience will interact with the panel through written questions. Don’t miss the opportunity to hear from national leaders on the way ahead.
This event will provide an opportunity for I/ITSEC participants to engage with Air Force leaders involved with shaping the implementation of technology across the Air Force enterprise to increase readiness and lethality. Participants will be representing Headquarters Air Force and several Air Force Major Commands (MAJCOMs). This panel discussion will enable the speakers to share their perspectives on the conference theme of “Winning the War of Cognition by Pushing Readiness and Lethality Boundaries” and discuss where they are taking the Air Force of the future, from the viewpoints of their respective positions.
In its National Security Strategy, the Trump administration identified the deployment of a secure 5th generation — 5G — wireless telecommunications capability as a priority. Since then, the secure fielding of a 5G network has become even more critical for our national security, economic competitiveness, and to the Department of Defense.

This special event will focus on the emergence of 5G capability. Particular attention will be paid to how the evolving state of 5G can apply to DoD training and education efforts. The panelists, representing diverse perspectives, will look into the changing future landscape of 5G and what the development of 5G-enabled capabilities could mean.

Questions to be explored include:

• How can 5G help shape future military training and education efforts and advance mission readiness and lethality?
• What opportunities exist for the military, industry, and academia to collaborate on 5G efforts?
• Can 5G spur leap-ahead advances for our warfighters and the commercial sector?
Our troops have more data available than ever before. Just think of the vast quantity of imagery, terrain data, and intelligence data — whether collected traditionally or through harvesting open sources like social media. **Data Outruns Our Capabilities!**

While Velocity, Volume, Variety and Veracity (the 4 “magical” V’s) of data are growing faster and faster, our capabilities to handle the data and — more importantly — to leverage data for our operational purposes are not growing nearly as fast.

Ultimately, today’s Warfighters and Commanders can’t leverage available data (e.g., for improved decision-making) as much as it is desired and required to dominate complex theaters. **Data Needs Our Attention!**

The most successful businesses around the globe have realized that data is the fuel of the 21st century economy. It is no longer enough to simply store data or to produce standardized reports — fully exploiting data and generating real value requires more effort. Businesses must truly understand their data, they must investigate their data, and they must be able to instantaneously transform their data into insights that can be readily used.

Data is regularly a lot more expensive than the simulator or command & control system using the data — yet defense organizations around the world focus their operations and maintenance efforts on the systems, not on the data. **Data Requires Our Care!**

We need to change our way of working! We need to treat data as a critical resource — a resource that requires constant attention and care. Without institutionalizing key aspects like data ownership and data portfolio management (very much like you manage your financial portfolio), our ability to benefit from data is limited, no matter how much data we have available, and the costs of dealing with data at scale are out of control. **Data — What You Should Know About It**

Data and information systems (including simulators and C2 systems) impact all aspects of 21st century defense from acquisition and training to operations and missions. This event gives every warfighter, commander, system engineer, project manager, and leadership a true view on the value of data, and what each and every one of you can do to really leverage data.
This panel considers an array of emerging simulation technologies to increase cognition and reduce operational risk to special operations forces (SOF). The technologies under consideration range from virtual/augmented reality to artificial intelligence/machine learning applications. The panelists are members of the United Special Operations Command (USSOCOM), representing a variety of government and commercial experiences, assembled to discuss and further an enterprise strategy toward developing future game-changing capabilities.

The overarching focus is mission planning and preparation for Special Operators, including facets of training and analysis. The panelists will describe their respective portfolios and give preliminary thoughts on 3D simulation and artificial intelligence/machine learning optimization. Subsequently, other USSOCOM subject matter experts and analysts will address technical aspects of potential capabilities, including proliferation of interoperable systems and use of common database to achieve best outcomes.

Potential questions to drive the panel discussion include: Beyond battlefield lethality, what other gaps might AI address for SOF? How does SOF integrate maintenance training into its predictive maintenance applications of aircraft, vehicles, and/or waterborne vessels? What simulation tools and skills are required to modernize database development and storage from home station to the tactical edge?
Superior technology and training is critical to the United States Navy’s advantage over its potential adversaries. In this special event, Navy Flag Officers will discuss how the U.S. Navy plans to advance the best-prepared fighting force in the world. This year’s I/ITSEC theme, “Winning the War of Cognition, by Pushing Readiness & Lethality Boundaries” highlights how the Navy uses the latest learning innovations and technology to modernize traditional military training methods to give us a distinct advantage.

In the face of any potential opponent, it is the readiness of our personnel – their ability to pivot and make sound decisions under pressure – that will provide our greatest asymmetrical, warfighting advantage. Because highly-skilled warfighters are able to make superior decisions and perform their missions better, training sits at the very core of naval readiness. To that end, the Department of the Navy is moving to become a true continual learning organization, because that is essential to maintaining Warfighting Readiness and ensuring excellence in the battle.

Likewise, the United States Maritime Strategy calls for the sea services to “create a true learning competency that unites our acquisition, requirements, and programming efforts to deliver the latest in technology and design, resulting in realistic simulation and live, virtual, and constructive scenarios before our people deploy...” High-quality training is an investment in improving the human performance of our warfighters. However, in developing training, we also have the responsibility to make affordability a priority throughout the training system cycle of research, development, acquisition and sustainment. To remain flexible, agile, and ready, our Navy seeks out and employs innovative training methods to train Sailors more efficiently and to ever-higher levels of proficiency while maintaining a high speed to fleet.

The Navy is taking efforts to prevent inefficiencies in the training pipeline and the training acquisition process. For the Navy, a key measure in deciding whether to invest in a new training technology is whether it will make the Naval force more lethal. Senior leaders know that people are foundational to everything the Navy does. The U.S. Military can have the best possible processes, the best ships, airplanes, rifles, and tanks – but without the people who operate and maintain them, they are worthless. This is why the Navy is dedicated to recruiting, training, and retaining the best Sailors in America.

Sailors with superior training are an essential component of maintaining maritime superiority, now and in the future. This panel of senior Navy leaders will provide insight from acquisition, research and development, and mission readiness perspectives into how effective and relevant training optimizes the human performance of U.S. Navy Sailors. As Chief of Naval Operations, Adm. Michael Gilday said, “We will question our assumptions. We will think differently about the competition that we are now in. We will be the navy the nation needs now and we will build a Navy the nation needs to fight and win in the future.”
Alignment of Army M&S Across the M&S Enterprise and the Army Future Force Modernization Enterprise

BUILD ONCE AND REUSE OFTEN!

WEDNESDAY, 4 DECEMBER
1400 – 1530 • ROOM S310AB
SE9

Moderators
Colonel Scott D. Gilman
Deputy Director, U.S. Army Modeling and Simulation Office

Panelists
Forrest Crain, Ph.D.
Director, Center for Army Analysis & U.S. Army Modeling and Simulation Office
John W. Diem, SES
Executive Director, U.S. Army Operational Test Command
Royce Manis
Highly Qualified Expert Soldier Lethality CFT Army Futures Command
Colonel Joseph M. Nolan
Deputy Director, STTC
Lori Mongold
Deputy Chief of Staff, Global Force Management, Chief Management Officer Headquarters Department of the Army, G-3/5/7
Lieutenant Colonel Carlos J. Kavetsky
M&S Integration Officer, SR Division, U.S. Army Modeling and Simulation Office
Glen Quesenberry
Program Manager, Army Geospatial Command

Since the stand up of Army Futures Command (AFC), the Army Modeling and Simulation Office (AMSO) has been the only Headquarters, Department of the Army (HQDA) organization that has collaborated in-depth with both AFC HQ and each Cross Functional Team to ensure unity of effort with regard to modeling and simulation. Additionally, the Commanding General, AFC, and the Deputy Chief of Staff, G-8, directed AMSO to align M&S between the two enterprises.

An information overview of how the Army M&S Enterprise collaborates with Army Future Command’s Cross Functional Teams in order to identify key areas for M&S innovation while exploiting opportunities to drive down technical costs, increase savings, and implement technical reuse.
A common mantra within the U.S. military has been to “train as you fight.” Yet, live training fails to replicate with fidelity the type of cyber and informationized operations that warfighters will experience in a contested and complex battlespace. Synthetic training environments can inject a much-needed degree of realism, replicating an information-saturated combat environment for non-cyber warfighter training. However, synthetic training systems, scenarios, and models must evolve to support this future.

Integrating cyber and informationized operations into non-cyber warrior training does not just require simulating the effects of an adversary’s cyber or information operations in a synthetic training environment. Warfighters must also understand the unique attributes that cyber warriors bring to the fight when pursuing multi-domain operations, to include timing, authorities, and classification, among others. Multi-domain operations require warfighters to more seamlessly work between domains to support, augment, or assure their mission. An integrated synthetic training environment must support this end.

This special event will highlight multi-domain battlespace training requirements, successes, challenges, gaps, and potential solutions from the perspective of multi-domain warfighters, cyber simulation and training researchers, and integrated synthetic training environment developers. Scientists and technologists across academia, industry, and the services will showcase technologies they have developed that allow cyber effects to propagate across environments. The technology demonstration should provide a networking opportunity, so that participants can work together to scale and implement ideas to better serve the warfighter.
Improve Joint and Multinational Simulation Interoperability

THE TIME IS NOW: SIMULATION INTEROPERABILITY FOR TRAINING AND MISSION REHEARSAL

Despite more than 25 years of experience in distributed simulation, we have made little progress in our ability to rapidly and routinely connect tactical simulators between different Services and nations. As live training resources diminish, simulation naturally assumes a bigger role in maintaining readiness. As we have observed during Bold Quest, numerous policy, programmatic and technical issues pose obstacles that prevent tactical warfighters from routinely training with other Service and coalition partners using distributed simulators to build and maintain joint fires proficiency.

The participants in this Special Event represent organizations who are actively working toward a shared long term goal of establishing a process for continuously improving simulation interoperability. Each participant has a different simulation experience to discuss (Civil–military relations, Digitally Aided Close Air Support (DACAS), Globally Integrated Operations (GIO), Net Enabled Weapons (NEW)), but the challenges are all familiar to the audience. Together, we must work to make one-off events of simulation integration into persistent capability that can be shared across all Services and multinational partners.

We hope these senior leader perspectives provide insights of interest to the I/ITSEC community on issues in networking, cybersecurity, information sharing, standards and how industry can help.
In conjunction with the Air Force’s Small Business Innovation Research (SBIR) program, the Simulators Program Office solicited proposals from small businesses to inject innovative technologies into operational training systems. The program office has asked small businesses to “pitch” how they can help the Air Force in certain areas or topics including but not limited to the following:

- High end weather effects within simulator gaming environments
- Deployable, austere environment high-fidelity simulator
- Visual acuity and fidelity of objects at long ranges within the simulator environment
- Interoperability among networked simulators
- Simulator interoperability considering releasability of capabilities
- Cloud-based simulators
- Performance based training, data collection and analysis
- Artificial intelligence aided instruction in simulator
- Shortening the timeline for maintenance training

The objective was not to ask small businesses to go out and invent something new, but rather to creatively repurpose existing technologies that could be leveraged to satisfy Air Force training needs. Ultimately the idea is to connect with industry which will help us move into the latest technological space faster.

The first phase of this effort, held in July 2019, resulted in a number of Phase I SBIR awards. In October, select Phase I awardees were given the opportunity to submit proposals for a Phase II award that would build on what was learned and demonstrated in their Phase I efforts. These companies were then invited to privately present their Phase II proposals to an Air Force panel at the Simulators Pitch Day event during I/ITSEC.

Regardless of whether the Phase II proposal resulted in an award or not, the selected companies are now given the opportunity to pitch their initiatives to the I/ITSEC community as a whole, during the “Media Day” event on 5 December. It is expected that attendees at this event will include major prime defense industry executives, venture capitalists and other service acquisition executives.
Iron Dev

A “COOKING SHOW” EVENT FOR DEVELOPERS

Main Event (Show)
THURSDAY, 5 DECEMBER
1000 – 1130 • LAUNCH PAD
BOOTH 793

Team Preparations
MONDAY, 2 DECEMBER
0830 – 1800 • ROOM S330G
TUESDAY, 3 DECEMBER
0830 – 1800 • ROOM S330G
WEDNESDAY, 4 DECEMBER
0830 – 1800 • ROOM S330G
FE1

Co-Hosts
Bob Kleinhample
Vice President, Training
Solutions SAIC

Alethea Duhon, Ph.D.
Technical Director, Air Force
Agency for Modeling and
Simulation

Mark Tanner
Senior Modeling and
Simulation Operations
Research Analyst; Tony Stark
Impersonator

Judges
Major General Maria R. Gervais
Director, Synthetic Training
Environment Cross
Functional Team

John Meyers, SES
Executive Director, Naval
Air Warfare Center Training
Systems Division

Col. Tony Millican, Ph.D., USAF
Director, Future Learning
Initiatives

Paul Thurkettle
Education & Training
Technologies Manager, Allied
Command Transformation,
North Atlantic Treaty
Organization

Amy Peck
Senior Director, Enterprise
Content, Vive Studios HTC
Vive

Come watch the finale of the Iron Dev competition which features teams of training system developers. During the first several days of the conference, teams have been given a challenge and are building training systems relevant to our warfighters. The final show will be similar to competitive food cooking shows. The show hosts will describe how the teams worked during the first few days of competition in a fun and entertaining way. Meanwhile, the teams will be on the stage making final preparations to their training systems. They will then present their systems live to the panel of judges and audience. The judges will critique the systems in areas of technical precision, use of the secret ingredient, how well they addressed the challenge in their solution, and how bold and innovative they were. During this show, the winner will be announced. The extent to which teams consist of early career developers will be considered in the final score.

The competition format will provide a fun and professional development opportunity to help grow future leaders in our developer community.
Best from Around the Globe features the Best Paper awardees of MODSIM World and ITEC. Each of the winners was selected by a committee and criteria specific to the particular global conference focus and theme. Come hear the award winners from MODSIM World and ITEC offer their outstanding presentations from these prestigious international conferences.

MODSIM World 2019 Best Paper
Simulation-Based Training’s Incorporation of Machine Learning
Ivar Oswalt, Ph.D., The MIL Corporation and Tim Cooley, Ph.D., DynamX Consulting

Machine learning (ML) is all around us. This paper describes ML and discusses emerging/innovative technological ideas on integrating ML into two categories of training systems. First are multi-person training simulators, such as convoy trainers, which — with the injection of ML — could realize decreases in training time and increases in proficiency. Second, the analysis expands these insights into the context of LVC training simulations. For LVC, it summarizes precursor semi-automated systems, highlights current ML applications, discusses the roles ML could play in future LVC environments, and describes how these systems could be wrapped in advanced training delivery approaches. This paper concludes with thoughts and considerations regarding ML topics that are critical in simulation-based training.

ITEC 2019 Best Paper
Making the Invisible Visible—Increasing Pilot Training Effectiveness by Visualizing Scan Patterns of Trainees Through AR
Jeanine Vlasblom, Netherlands Aerospace Centre NLR

This paper describes the development and evaluation of a scan pattern monitoring system using augmented reality (AR). The system enables instructors to monitor scan patterns of pilots by non-intrusively tracking the pilot’s eyes and displaying the scan patterns to the instructor through augmented reality. Subject matter experts (pilot instructors) evaluated this application as a support for the debriefing.
The Department of the Navy (DON) recognizes it lacks the agility needed to assure relevance in the modern era of technology and competition. How do we flip the script and leverage the leading technologies and agile processes being developed in the private sector? It is critical that DON maintains relevance and closes the adversarial gap through acquisition agility.

During this panel, a group of Navy acquisition professionals will discuss acquisition agility challenges and potential solutions from both government and industry partners. This will be a lively discussion of how to take great ideas and turn them into readiness and new capabilities, to meet the Navy acquisition agility challenge.
Come and hear industry experts speak on topics such as education, design thinking, human-machine teaming and more. Have you ever sat through a long presentation and lamented that there were only five minutes of content? Imagine if you could hear only that five minutes of targeted, compelling and maybe even provocative content... that’s Ignite! Ignite is a presentation format that allows dynamic, high octane speakers a platform to share their passion and ideas. I/ITSEC’s version of Ignite focuses on topics that are relevant and thought-provoking. So bring your short attention span and prepare to be inspired, entertained, educated and amazed by an array of talented speakers. Each talk is jam-packed with inspiration and information using 20 slides that auto-advance every 15 seconds, creating a fun and dynamic event. See online program for an updated presenter list.

**Presenters**

**John Aughey**  
The Boeing Company  
*Students! Students! Students!*

**Anne Little, Ph.D.**  
SAIC  
*Design Thinking*

**Ella M. Phillips**  
Escambia Virtual Academy  
*Is Virtual Reality Always the Best Instructional Medium?*

**Nathan Schurr, Ph.D.**  
Aptima, Inc.  
*How I Met Charlie: Developing the World’s First AI Panelist*

**Samantha Dubrow**  
Aptima, Inc.  
*Human-Machine Teaming: What Skills do the Humans Need?*
Has Big Data lived up to the hype? Behold a spirited debate unfold between data scientists from the Army and Navy training worlds about the troubles, possibilities, and results from exploring the Big Data promise. If we are going to build the AI and Deep Learning capability of tomorrow what do we need to do today? Attendees are invited to add questions to the conversation.
Imagine 2030: AI-Empowered Learning

WEDNESDAY, 4 DECEMBER
0830 – 1000 • ROOM S320GH
FE6

Moderator
Daniel Serfaty
Founder and Chief Executive Officer, Aptima, Inc.

Participants
Sae Schatz, Ph.D.
Director, Advanced Distributed Learning (ADL) Initiative

Benjamin Nye, Ph.D.
Director of Learning Sciences, University of Southern California, Institute for Creative Technologies

Ulrik Christensen, M.D.
Executive Chairman and Founder Area9

Colonel Robert H. “Hammerhead” Epstein
Commander, Air Force Agency for Modeling and Simulation

Charlie, A.I.
AI-Empowered Panelist, Aptima, Inc.

Join us for a fireside chat debate where panelists (four humans and one artificially intelligent bot) are asked to imagine what learning will look like in 2030. AI is poised to revolutionize how we approach training and learning; these panelists will share their perspectives on the dramatic impact that AI will have on that future. And while the human panelists lay out their vision, the AI panelist — driven by a cutting-edge, I/ITSEC-trained generative language model — will be creatively answering questions and providing its own vision in real-time.

The world is searching for better and more productive ways to incorporate AI in our lives. The military services are exploring the potential for AI to increase warfighter readiness, enable precision training, and ensure overmatch. And while AI is being used largely experimentally today, the potential is high for significant AI-driven increases in training effectiveness in the years to come.

One key topic for the discussion is how AI can go beyond generating learning materials and experiences. It is important to start thinking now of how we will incorporate more capable AI as instructors and even student/trainee peers, enabling collaboration and co-learning. Much in the same way we imagine AI being embedded in the learning of the future, we plan to embed AI into our panel discussion as well.

These panelists have both diverse perspectives and diverse backgrounds, ranging from academic to military to industry. Come and find out what each of our panelists have to share regarding the dramatic impact that AI will have on (and in) the future of learning.
Competency-based learning has been around for a while, yet is gaining traction in the commercial aviation world as the new preferred method for pilot training and performance evaluation. This special event will gather speakers who have helped to define standards and approaches for competency-based learning from across the spectrum of military, commercial and academic approaches.

This event is special because it brings together experts on competency-based learning from multiple areas of practice: from those in the military and academic domains who have been implementing this for some time, to those from the commercial aviation industry where the standards are newly emerging. We will present perspectives of those who support competency-based learning as a positive path for learning assessment, as well as others who have encountered difficulty in such implementation.
Patient Safety in Healthcare: The Role of Modeling and Simulation

INCREASING PATIENT SAFETY THROUGH SIMULATION

WEDNESDAY, 4 DECEMBER
1400 – 1530 • ROOM S310C
FEB

Moderator
Grace Peng, Ph.D.
Program Director, Division of Discovery Science & Technology, National Institute of Biomedical Imaging and Bioengineering

Panelists
Colonel Jeffrey Mikita, M.D.
USA Division Chief, Medical Modernization and Simulation Division, Defense Health Agency

Carolyn Lauzon, Ph.D.
Deputy Director of Artificial Intelligence & Technology, U.S. Department of Energy

Dana Andersen, M.D.
Scientific Program Director, Digestive Disease and Nutrition, National Institute of Diabetes and Kidney Diseases

Lieutenant Commander USPHS
Rachel Slayton, Ph.D.
Mathematical Modeling Unit Lead, Healthcare Quality, Centers for Disease Control and Prevention

Steven H. Platts, Ph.D.
Deputy Chief Scientist, Human Research Program, National Aeronautics and Space Administration

Jack Norfleet, Ph.D.
Chief Engineer, Medical Simulation Research Branch, U.S. Army Futures Command

David Rodrick, Ph.D.
Healthcare Administrator, Agency for Healthcare Research and Quality

This is an NTSA-sponsored event in support of the Patient Safety Working Group established after I/ITSEC in 2018. The purpose is to continue the dialog surrounding patient safety and the role that M&S has in supporting patient safety across healthcare. This is a part of a series of activities to encourage participation from Government agencies, hospitals, universities, device manufacturers and organizations surrounding healthcare to expand the use of M&S to minimize risk and save money.

Session Chair:
Teresita Sotomayor, Medical Simulation and Performance Branch US AFC CCDC Soldier Center – STTC
Multinational Perspectives on Live, Virtual and Constructive Implementation in Ops

THE “WILD SIDE” OF PLANNING AND IMPLEMENTING LVC IN OPS. MULTINATIONAL SUCCESSES AND CHALLENGES

WEDNESDAY 4 DECEMBER
1400 – 1530 • ROOM S330EF
FE9

Moderator
Timothy Steffen, CMSP
Former Warrior Prep Center, Deputy Director and Chief Plans & Requirements, now with the Air National Guard, Washington, DC

Panelists
Wing Commander Mick Tully
Executive Officer, Air Force Ranges Directorate – Air Warfare Centre, Project Manager LVC and Ranges Capability

Wing Commander Ruari Henderson-Begg, MA RAF
Air Capability Delivery | DOTC(A) Programme Manager, HQ Air Command, DOTC(A) SO1

Major J.C. (Hans) van de Velde
Air & Space Warfare Centre, Royal Netherlands Air Force

Lieutenant Colonel Roberto Ambra
Italian Air Force – Air Staff Logistics Department, Mission Systems / Training & Simulation Manager

A number of multinational partners are investing in live, virtual, and constructive technologies and developing novel ways of blending these to achieve greater training value and improved readiness outcomes across a range of mission spaces and contexts.

Five invited international subject matter experts will discuss their national perspectives and activities as they relate to the operational integration of live, virtual, and constructive capabilities “in the wild of day-to-day ops.”

Each presenter is actively involved in their country’s day-to-day planning and implementation of LVC capabilities. They will highlight what they are doing today and planning in the near future, and discuss common and unique challenges and payoffs related to their LVC applications.

Session Chair:
Josh Looper, AFRL
Continuing our Black Swan series of panel discussions, we propose the scenario of a deep fake video authenticated by a credible insider threat. We examine the artificial intelligence (AI) algorithms behind the creation of deep fake videos and how they can be used for training and possibly public deception. We also add the intrigue of using an insider threat to authenticate this deceptive video and how insider threats can be used to gain access to the inner circle information and possibly sway public opinion.

As training videos are used extensively in the military and industry, the science of AI and its application to creating deep fake videos must be explored and understood. Insider threat knowledge and the tradecraft includes the use of such deception and thus complicates its countermeasures. This session hopes to introduce the audience to these techniques and explore both their nefarious and beneficial uses to the training and simulation communities.

The term black swan is used to describe a low probability/high impact event which could profoundly affect our future. The term comes from the 2007 book, *The Black Swan: The Impact of the Highly Improbable* by Nassim Nicholas Taleb, where he presents various world changing events and advocates anti-fragility to not only survive but thrive during crises. Modeling and simulation can play a major part in exploring these events in a cost-effective manner.

Please join us for this engaging session!
The landscape for training and education is changing rapidly. Increasing operational demands, new technologies, and an increased understanding of human performance have us rethinking learning and development. How do we harness these new opportunities to develop talent and enable learning, particularly, learning at scale? After a multiyear study, a new book — Modernizing Learning: Building the Future Learning Ecosystem — provides a blueprint for the future learning ecosystem. This vision is characterized by interconnected lifelong learning systems, a blending of formal and informal learning, and an integration of emerging technologies with contemporary learning science principles. These concepts promise to revolutionize talent development, but only if they can bridge the research–practice gap.

Extensive research, across myriad disciplines, has already examined many aspects of the future learning ecosystem. However, to achieve its full implementation and maximal benefits, it’s necessary to harmonize the advancements in learning science, technology, data science, organizational dynamics, and public policy.

This panel brings together experts who contributed to the book Modernizing Learning. The speakers will consider the future of learning—and, notably, how we realize this vision in the real world—across six aspects: Tech infrastructure, design, policy and commitment, governance, and human infrastructure. This session will be moderated by the book’s co-editor, Sae Schatz, Ph.D. She will challenge the panelists to outline actionable plans for achieving the future learning in practice and will engage the audience to encourage dialog and interactivity in this session.
THURSDAY, 5 DECEMBER
1030 – 1200 • ROOM S330EF
FE12

Moderator
Bernice Glenn
Senior Vice President of Strategic Partnerships,
NSTXL

Panelists
Marianna Eddy, Ph.D.
Team Leader, Cognitive Science and Applications,
Combat Capabilities Development Command Soldier Center, U.S. Army

Pinata Sessoms, Ph.D.
Research Biomedical Engineer, Biomechanist, Director of the Physical and Cognitive Operational Research Environment (PhyCORE) Laboratory, Warfighter Performance Department and Operational Readiness Directorate, Naval Health Research Center

Nadia Matthews
Strategic Initiatives Director, Microsoft Federal

Elizabeth Baron
Vice President, Immersive Solutions at Silverdraft Supercomputing

This must-attend event brings together a panel of thought leaders who are implementing immersive technologies in defense and commercial applications. They will share use cases from the fields of training, medicine, and engineering; discuss some of the most pressing challenges to effective implementation; and offer guidance on how to generate buy-in among colleagues for adopting immersive technology.

The discussion will appeal to attendees who are either learning to develop better business cases for the use of AR, VR, and MR in their practice or looking for guidance on how to take their technological capabilities in the areas of immersive technology to the commercial sector. The audience will be invited to pose questions to and engage in dialogue with the panelists at the end of the session.
New and Emerging Augmentation Technologies for Training and Operations within the NATO Alliance Nations

SHOWCASE THE STATE OF THE ART IN HUMAN PERFORMANCE AUGMENTATION

THURSDAY, 5 DECEMBER
1330 – 1500 • ROOM S310C
FE13

Moderators
Elizabeth Biddle, Ph.D.
Technical Fellow/RTG Member, Boeing Research & Technology, The Boeing Company (United States)

Benjamin Goldberg, Ph.D.
Senior Scientist/RTG Member and Co-Chair, U.S. Army CCDC-Soldier Center, STTC (United States)

Panelists
Thomas Alexander, Ph.D.
RTG Member/Co-Chair, Federal Institute for Occupational Safety and Health (BAUA; Germany)

Jerzy Jamais, Ph.D.
RTG Member, Toronto Research Centre – Defence Research and Development Canada (Canada)

Glenn Gunzelmann, Ph.D.
RTG Member U.S. Air Force Research Laboratory (United States)

Peder Sjolund, Ph.D.
RTG Member, Skydome (Sweden)

Ian Greig, Ph.D.
RTG Member, Defence Science and Technology Laboratory (United Kingdom)

Dexter Fletcher, Ph.D.
RTG Member, Institute for Defense Analyses

LTC Vincent Capaldi, M.D.
RTG Member, Walter Reed Army Institute of Research

In this Special Event, we showcase the North Atlantic Treaty Organization (NATO) Research Task Group (RTG) focused on the assessment of human performance oriented augmentation technologies. The event will start with a short engagement with the RTG to review task group objectives, followed by an overview of the innovative technologies that will be showcased. We provide an interactive forum to demonstrate current trends in augmentation technology in the context of human performance. This will involve hands-on demonstrations of eight current and emerging technologies that interact with and stimulate user(s) perceptual systems resulting in higher learning, performance, retention, and/or transfer. As a participant in the Special Event, you will have a chance to engage directly with RTG members and ITSEC attendees in this focused context. The event will be documented and included as a chapter in the RTG final recommendation report.

Technology Demonstrations:
• Madigan Army Medical Group (Kyle Couperus)
• Design Interactive (Luke Devore)
• NeuroTracker (Scott Kozak and Lee Sidebottom)
• Modest Tree Media (Sam Sannandeji and Emily Smit)
• Intelligent Automation (Bob Pokorny, Chad Zalkin, Jeff Kish and Lisa Holt)
• Soar Technology (Alyssa Tanaka)
• Charles River Analytics (Caroline Kingsley, Arthur Wollocco and Michael Jenkins)
• HTC Vive (Amy Peck and Frank Black)
• Skydome (Peder Sjolund)
• University of Central Florida METIL (David Metcalf, Tim Welch, Michael Eakins)
• Microsoft/Insight Enterprise (Matt Fedorovich and David Eager)

Session Chair: Craig Langhauser, Collins Aerospace
Conceptual Modeling of Adaptive Instructional Systems (IEEE Project 2247.1)

This event is intended to expose the I/ITSEC community to IEEE learning technology activities in the area of conceptual modeling of Adaptive Instructional Systems (AISs), which are artificially-intelligent, computer-based systems that guide learning experiences by tailoring instruction and recommendations based on the goals, needs, and preferences of each individual learner or team in the context of domain learning objectives. AISs include learning technologies that include intelligent tutoring systems (ITSs), intelligent mentors (recommender engines), and intelligent instructional media.

Members of the IEEE Project 2247.1 standards activities are reviewing existing and emerging learning technologies to classify the components, features, and processes of AISs. In other words, what makes an AIS an AIS?

This panel will discuss AIS ontologies and terms of reference. Panelists will advocate for schemes to model AISs at various levels of detail and will discuss AISs as self-improving instructional technologies that can tailor learning and development experiences to meet the goal, needs, and preferences of each individual learner or group of learners.

Panel members represent Industry and Academic Research perspectives on AISs and draw on decades of work designing, building and evaluating a wide range of AISs for training and education applications.

Potential AIS consumers will learn about the potential of current AISs and expectations for future capabilities to make AISs an effective and affordable solution for training and educational domains.

AIS developers will gain perspective on the range of AIS capabilities and design issues that will enable customers to exploit the power of AISs.

View panelist papers through the I/ITSEC 2019 Mobile App.

Moderator
Robert Sottilare, Ph.D.
Science Director, Intelligent Training, Soar Technology

Panelists
Xiangen Hu, Ph.D.
Professor of Psychology, University of Memphis
Dean, School of Psychology, China Central Normal University

Randolph Jones, Ph.D.
Senior Artificial Intelligence Engineer, Soar Technology

Andrew Hampton, Ph.D.
Assistant Professor, Institute for Intelligent Systems, University of Memphis
Secretary, IEEE Project 2247

The European Perspective on Battlelabs and the Role of Simulation

Battlelabs are used to provide insight in current and future military operations and develop new systems and operational concepts. The challenges of a complex mission environment lead to increasing use of simulation as a cost-effective technology for Battlelabs.

The European Training and Simulation Association (ETSA, the European voice of the modelling, simulation, and training community) has invited representatives from several European armed forces to discuss the national vision on the use of Battlelabs and the role of Simulation. The presenters will provide an overview of current capabilities and share examples of Battlelab applications that leverage the advantages of simulation. The evolution and mid-term plans will be discussed as well as the partnerships (NATO, EDA, R&D, Industry) that are in place or desired to further develop Battlelab simulation capabilities.

The ETSA special event panel session will engage with the audience on the way ahead towards interoperable Battlelabs and discuss how to engage with ETSA and leverage its partnership agreements with NTSA, EDA and Industry.

Moderator
Wim Huiskamp
Chief Scientist, Modelling, Simulation and Gaming TNO, Defence Research, ETSA Board Member (The Netherlands)

Panelists
Andy Smith
ETSA Chairman, Halldale (United States)

Colonel Jean Marchal
Colonel (Armament) Direction Générale de l’Armement (France)

Andrew J. Fawkes
Independent Consultant and Engineer, Thinke Company, (United Kingdom)

LtCol Peter van Onzenoort
M&S Expert, Airforce Aerospace Battle Lab (CABL), Royal Netherlands Army (The Netherlands)

Lesley Jacobs
Senior Scientist, Military Operations, Training and Simulation, TNO Defence Research (The Netherlands)

Session Chair: Marty Bink, University of Georgia
Session Chair: Leslie Dubow, VHA EES
Adaptive Instructional System Interoperability Standards (IEEE Project 2247.2)

This event is to expose the I/ITSEC community to IEEE learning technology activities in the area of interoperability and reuse of Adaptive Instructional Systems (AISs) and AIS components. AISs are artificially-intelligent, computer-based systems that guide learning experiences by tailoring instruction and recommendations based on the goals, needs, and preferences of each individual learner or team in the context of domain learning objectives. AISs include learning technologies that include intelligent tutoring systems (ITSs), intelligent mentors (recommender engines), and intelligent instructional media.

This event provides an intersection of a large professional society (IEEE) and activities related to I/ITSEC professional disciplines.

This will provide insight to the I/ITSEC audience regarding:

- Learning engineering as an academic and career field
- Learning-technology, international development efforts
- Learning-technology, international standards
- Brings new learning scientists and engineers to I/ITSEC

Moderator
Keith Brawner, Ph.D.
Senior Engineer, Army Combat Capabilities Development Command Soldier Center

Panelists
Roger Azevedo, Ph.D.
Professor and Lead Scientist, Learning Sciences and Educational Research, University of Central Florida

Winston “Wink” Bennett, Ph.D.
Readiness Science and Technology Product Line Leader, U.S. Air Force Research Laboratory

Richard Tong
Chief Architect and General Manager, U.S. Operations Squirrel AI Learning by Yixue Group

Learning Engineering: A New Academic Discipline and Engineering Profession

This event provides an intersection of a large professional society (IEEE) and activities related to I/ITSEC professional disciplines. The goal of this panel is to develop recommendations regarding learning engineering as an academic and career field.

Schools, colleges, and training departments are deploying more and more new technologies with the goal of improving learning and training effectiveness. The quantity and diversity of these technologies, and the increasingly ambitious pedagogical innovations being explored, has created a demand for engineers with special training in how people learn and how technology is used. These are called learning engineers. The panelists will share their ideas about why learning engineers are needed, what a learning engineer must know, the problems learning engineers solve, and how this will impact the Government training, education, and simulation community.

This will provide insight to the I/ITSEC audience regarding:

- Learning sciences, simulation, training, education, human factors
- Learning engineering as an academic and career field
- Learning-technology, international development efforts
- Learning-technology, international standards

Moderator
Avron Barr
Adjunct Staff, Institute for Defense Analyses Chair

Panelists
Shelly Blake-Plock
President and Chief Executive Officer, Yet Analytics, Inc.

Robby Robson, Ph.D.
Chief Executive Officer, Eduworks, Inc. & IEEE Board of Governors

Dylan Schmorrow, Ph.D.
Chief Scientist and Executive Vice President, Soar Technology

Michelle Barrett, Ph.D.
Vice President, Research Technology, Data Science, and Analytics, ACT Inc.
Best Practices for the Evaluation of Adaptive Instructional Systems
(IEEE Project 2247.3)

This event is intended to expose the I/ITSEC community to IEEE learning technology activities in the area of recommended practices for the evaluation of Adaptive Instructional Systems (AISs) which are artificially-intelligent, computer-based systems that guide learning experiences by tailoring instruction and recommendations based on the goals, needs, and preferences of each individual learner or team in the context of domain learning objectives. AISs include learning technologies that include intelligent tutoring systems (ITSs), intelligent mentors (recommender engines), and intelligent instructional media.

As AISs proliferate and interest in such systems grows, there is notable variation in providers’ claims about the features of their AISs. Potential consumers now have to sort out answers to questions such as: What is an AIS? What makes AISs good, or better than other learning support mechanisms? What makes one AIS better (or more appropriate to some application) than another AIS? How does a consumer find or generate answers to questions like these?

This panel will discuss guidelines and standards for conveying to consumers useful information about the value of AIS products. That includes characterizing system features and the benefits they provide. It also includes characterizing overall system effectiveness—in some range of application contexts—at providing tangible measurable value. Such value might be in terms of improved learning outcomes, cost efficiencies, or other desirable attributes. Panelists will advocate for schemes to conceptualize, collect, present, and interpret information on AIS capabilities and performance.

Panel members represent Government, Industry, and Educational Research perspectives on these questions, drawing on decades of work commissioning, designing, building and evaluating a wide range of AISs for education and training applications.

Potential AIS consumers will learn more about what to expect from an AIS, and how to tell whether any particular offering is likely to provide the kinds of benefits required for their application.

AIS developers will gain perspective on the range of issues that matter in real applications, and how to informatively position their offering in the evolving marketplace.

View panelist papers through the I/ITSEC 2019 Mobile App.

Moderator
Eric A. Domeshek, Ph.D.
AI Project Manager, Stottler Henke Associates, Inc.

Panelists
Sowmya Ramachandran, Ph.D.
Principal Research Engineer, Stottler Henke Associates, Inc.
Natalie B. Steinhauser
Senior Research Psychologist, Naval Air Warfare Center Training Systems Division
Louise Yarnall, Ph.D.
Senior Research Social Scientist, Center for Education Research & Innovation, SRI Education

Session Chair: Timothy Quiram, U.S. Coast Guard
Simulation Standards and SISO

Standards provide a proven method for increasing interoperability and reducing time and cost to deliver effective solutions. This is especially true in areas like modeling, simulation, and training where a mix of existing and/or newly developed components often need integrating.

M&S standardization leads from the US DoD, NATO, and the Simulation Interoperability Standards Organization (SISO) will describe their standardization processes. You will hear from leads and proponents of three SISO standards at different points in the standardization process—concept exploration for a new standard, a recently published standard, and a well-established, supported standard.

You will gain renewed appreciation for the value of standards and a deeper understanding of how they are developed, adopted, supported, and maintained. If you attended last year, plan to attend again this year. US DoD, NATO, and SISO standards program information will be updated and a different set of standards will be covered this year.

**Moderator**

Roy Scrudder
Program Manager, Applied Research Laboratories, The University of Texas at Austin

**Panelists**

Brian Miller
Associate Director, Defense M&S Coordination Office

Wim Huiskamp
Chief Scientist, Modelling, Simulation and Gaming
TNO Defence Research (Netherlands)

Katherine L. Morse, Ph.D., CMSP
Principal Professional Staff, Johns Hopkins University,
Applied Physics Laboratory (JHU/APL)

Randy Saunders
Principal Professional Staff
JHU/APL

Lt Col Stefan Ungerth
Head, Air Force Air Combat Simulation Center
Swedish Defence Research Agency

David Drake
Senior Professional Technical Staff, JHU/APL

Michael O’Connor
Chief Technologist, Trideum Corporation

David Taylor
Senior Staff Systems Engineer, Lockheed Martin Missiles and
Fire Control

Charles Turnitsa, Ph.D.
Assistant Professor, Engineering & Computer Science, Regent
University

Bill Lademan, Ph.D.
Director, USMC Wargaming Division, Marine Corps Warfighting
Laboratory

Session Chair: Leigh Yu, OSD

Geospatial Forum

The Geospatial Forum provides a unique opportunity for geospatial stakeholders and database producers to meet with leaders in geospatial standardization, and geospatial dataset consumers and suppliers to discuss goals and challenges; and explore emerging technology, standards and services to reduce data production times to empower the agile force. This year we are expanding on the development and use of geospatial standards for models and simulations that support the warfighter.

The transition to open consensus-based standards for geospatial data creates opportunities for modeling and simulation systems to reduce technology risk by:

Reduce technology risk by:

- Improving interoperability through convergence on data standards
- Broadening choice of solutions to a growing list of commercial products
- Increase efficiency and effectiveness through:
  - Rapid integration of information, technology and authoritative data
  - Taking advantage of advancements in data storage, computing, and visualization capabilities.

**Opening Comments**

Randy K. Jackson
Chief of Mission Preparation, U.S. Special Operations Command

**Moderator**

Scott Sztutzmeister
Senior Research Analyst, Defense Modeling and Simulation Coordination Office

**Panelists**

Wim Huiskamp
Chief Scientist, Modelling, Simulation and Gaming
TNO Defence Research (Netherlands)

Katherine L. Morse, Ph.D., CMSP
Principal Professional Staff, Johns Hopkins University,
Applied Physics Laboratory (JHU/APL)

Randy Saunders
Principal Professional Staff
JHU/APL

Lt Col Stefan Ungerth
Head, Air Force Air Combat Simulation Center
Swedish Defence Research Agency

David Drake
Senior Professional Technical Staff, JHU/APL

Michael O’Connor
Chief Technologist, Trideum Corporation

David Taylor
Senior Staff Systems Engineer, Lockheed Martin Missiles and
Fire Control

Charles Turnitsa, Ph.D.
Assistant Professor, Engineering & Computer Science, Regent
University

Bill Lademan, Ph.D.
Director, USMC Wargaming Division, Marine Corps Warfighting
Laboratory

Session Chair: Richard Grohs, USAF, HQ ACC/A5T
Air Force Acquisition Update

Session Chair: Rob Lechner, The Boeing Company

This Special Event will provide the latest information from the Air Force regarding acquisition policy and upcoming training system acquisition actions. It will feature remarks by Mr. Paul Waugh, the Air Force Program Executive Officer for Agile Combat Support, who will share his perspective on the current state of the Air Force acquisition process and ongoing initiatives, as they apply to the I/ITSEC community. This will be followed by a presentation by Col Philip Carpenter, Senior Material Leader, Simulators Program Office. He will provide an update on Air Force simulator business opportunities, as a follow-on to the Simulation and Training Community Forum (STCF) held earlier this year. The session will be two briefings followed by Q&A.

Moderator
Tony DalSasso
Engineering Technical Advisor
Simulators Program Office

Panelists
Mr. Paul Waugh, SES
Program Executive Officer
Agile Combat Support Directorate
Colonel Philip Carpenter
Senior Materiel Leader
Simulators Program Office

U.S. Army PEO STRI TSIS Update

Session Chair: Donna Veil, Carley Corporation

The U.S. Army Program Executive Office for Simulaiton, Training, and Instrumentation (PEO STRI) Training and Simulation Industry Symposium (TSIS) updates at I/ITSEC will provide the latest information regarding the current and future PEO STRI business opportunities. This will be updated from the June 2019 TSIS and will include presentations from the Project Managers, International Program Office (IPO) and the Army Contracting Command-Orlando.

Moderator
Donna Veil
G3/G5 Plans and Strategy, U.S. Army PEO STRI

Navy Vision from the Training System’s Program Offices

Session Chair: John Hodak, NAWCTSD

Each year at I/ITSEC, a panel of Navy captains and senior civilian leaders representing the Navy’s training acquisition organizations convenes to discuss the year’s highlights and share their strategic vision. I/ITSEC participants are welcome and encouraged to attend to hear about the state of the Navy’s Training Systems.

Moderator
Mike Merritt
Acquisition Director, Naval Air Warfare Center Training Systems Division

Panelists
Captain Tim Hill, USN
Command Officer, Naval Air Warfare Center Training Systems Division

Captain Lisa Sullivan, USN
Program Manager, Naval Aviation Training Systems NAVAIR PMA-205

Robert Kerno
Program Manager, Naval Surface Training Systems, NAVSEA PMS-339

Jimmy Lee
Director of Submarine Training, NAVSEA O7TR
Industry Days

**U.S. Air Force**
Training Systems Acquisition (TSA) IV
Monday, 2 December • 1500 – 1700 • Room S329

KC-10 Training System
Wednesday, 4 December • 1300 – 1400 • Room S230C

C-5 Training System
Wednesday, 4 December • 1430 – 1530 • Room S230C

C-17 Training System
Wednesday, 4 December • 1600 – 1700 • Room S230C

Man-In-The-Loop (MITL)
Thursday, December 5 • 0900 – 1200 • Room S230C

**U.S. Army**
Synthetic Training Environment (STE) Update to Industry
Monday, 2 December • 1300 – 1430 • Room S330EF

Cyber Resiliency and Training
Monday, 2 December • 1500 – 1630 • Room S330EF

Building the Network to Deliver STE
Monday, 2 December • 1500 – 1600 • Room S230D

Training and Readiness Accelerator (TReX) Overview and Update
Tuesday, 3 December • 1000 – 1100 • Room S230D

Virtual Training Systems Competitive Opportunities Update
Tuesday, 3 December • 1100 – 1200 • Room S230D

Future Army System of Integrated Targets (FASIT) Technology Working Group
Tuesday, 3 December • 1300 – 1500 • Room S230D

STE: Improving Realism in Live and Virtual
Wednesday, 4 December • 1145 – 1245 • Room S230D

Live Training Transformation (LT2) Marketplace - How Industry Can Participate
Wednesday, 4 December • 1300 – 1400 • Room S230D

Future Army System of Integrated Targets (FASIT) Program of Record Introduction
Wednesday, 4 December • 1400 – 1500 • Room S230D

**U.S. Marine Corps**
Advanced Small Arms Lethality Trainer (ASALT)
Monday 2, December • 1300 – 1400 • Room S230B

Wargaming
Tuesday, 3 December • 1300 – 1400 • Room S230B

Trackless Mobile Infantry Target (TMIT) 1:1 Sessions
Wednesday, 4 December • 1300 – 1430 • Room S230B

Combat Vehicle Training Systems Version 3.0 (CVTS 3.0), Advanced Gunnery Training System (AGTS)
Wednesday, 4 December • 1445 – 1545 • Room S230B
International Pavilion

International attendees can meet and connect with counterparts from around the world. Limited private meeting space is available on a first-come, first-served basis to our international participants and may be scheduled at the International Pavilion’s Welcome Desk. Additional information about the many international activities throughout I/ITSEC is readily available in the International Pavilion.

International registrants should register at the dedicated international check-in station positioned near the main registration desk in the south concourse. International conference attendees’ meeting bags will be available for pick-up at the main registration desk this year. Other materials of interest for international attendees will be available in the International Pavilion.

Program Notes of Special Interest

For International Attendees

Papers
Explore your Program for the ♣ indicating Papers from International Authors.

Tutorial
Monday, 2 December • Room S320D • 1430-1600
Introduction to HLA (1916)
The Role of Simulation
every one can do to really leverage data.
and leader a true view on the value of data and what each and
every warfighter, commander, system engineer, project manager
tions and maintenance efforts on the systems, not on the data.
– yet, defense organizations around the world focus their oper-
Sources like social media. Data is regularly a lot more expensive
of the vast quantity of imagery, terrain data and intelligence data
– whether collected “traditionally” or through harvesting open
– yet, defense organizations around the world focus their oper-
the world, this event will highlight some of these and
provide an opportunity for each national subject-matter-expert
(SME) to share their unique plans, implementations and expe-
tiences to date and offer lessons learned that are both common
and unique to their applications and their armed forces.

The European Perspective on Battlelabs and the Role of Simulation
Tuesday, 3 December • 1600 – 1730 • ROOM S329
(Best from Around the Globe
FE2 • Tuesday, 3 December • 1400 – 1530 • ROOM S320D
(See page 28 for more information)
Battlelabs are used to provide insight in current and future military
operations and develop new systems and operational concepts. The
challenges of a complex mission environment lead to increasing
use of simulation as a cost-effective technology for Battlelabs. The
European Training and Simulation Association (ETSA), “The Euro-
pean Voice” of the Modelling, Simulation & Training community,
have invited representatives from several European armed forces to
discuss the national vision on the use of Battlelabs and the role of
simulation. The presenters will provide an overview of current ca-
pabilities and share examples of Battlelab applications that leverage
the advantages of simulation. The evolution and mid-term plans
will be discussed as well as the partnerships (NATO, EDA, R&D,
Industry..) that are in place or desired to further develop Battlelab
simulation capabilities. The ETSA Special Event panel session will
engage with the audience on the way ahead towards interoperable
Battlelabs and discuss how to engage with ETSA and leverage its
partnership agreements with NTSA, EDA and Industry.

The Impact of Data and Simulations for the 21st
Century Warfare
Wednesday, 4 December • 0830 – 1000 • ROOM S310AB
(See page 20 for more information)
Our troops have more data available than ever before. Just think
of the vast quantity of imagery, terrain data and intelligence data
– whether collected “traditionally” or through harvesting open
sources like social media. Data is regularly a lot more expensive
than the simulator or command & control system using the data
– yet, defense organizations around the world focus their oper-
ations and maintenance efforts on the systems, not on the data.
Data and information systems (including simulators and C2 sys-
tems) impact all aspects of 21st century defense from acquisition
and training to operations and missions. This Special Event gives
every warfighter, commander, system engineer, project manager
and leader a true view on the value of data and what each and
every one can do to really leverage data.
The training, education, and simulation community will once again demonstrate their game-changing innovations to key government decision makers and procurement officials at I/ITSEC 2019. A panel of government and industry members selected the most innovative white papers via an objective, competitive process. The selected demonstrators employ technological innovations, re-define training and simulation processes, or create something entirely new that is going to change the way we train, simulate and educate.

The Launch Pad Special Event targets all I/ITSEC attendees, including select government acquisition stakeholders. Acquisition program leadership and Science and Technology divisions will be at I/ITSEC to assess the Launch Pad presentations’ technology readiness levels. Speed to market is a key acquisition principle, and Launch Pad provides an opportunity to highlight technology that may be appropriate for rapid prototyping/rapid fielding initiatives.

### Tuesday, 3 December – Session 1 (Language Tools and Apps)

<table>
<thead>
<tr>
<th>Time</th>
<th>Presentation Title</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>1400</td>
<td>Using Artificial Intelligence Technology and Personalized Services for Optimized Dynamic Language Teaching and Learning</td>
<td>Ponddy Education, Inc.</td>
</tr>
<tr>
<td>1430</td>
<td>An App-based Approach for Reliably and Efficiently Bringing Users to Fluency in a New Language</td>
<td>Fluent Forever, Inc.</td>
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</tbody>
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### Tuesday, 3 December – Session 2 (Game Engine Tools)

<table>
<thead>
<tr>
<th>Time</th>
<th>Presentation Title</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>1600</td>
<td>One World SDK for Unity</td>
<td>SimBlocks LLC</td>
</tr>
<tr>
<td>1630</td>
<td>Physically Based Night Vision Goggle Sensor Simulation in Game Engine</td>
<td>Presagis</td>
</tr>
</tbody>
</table>

### Wednesday, 4 December – Session 3 (Augmented/Virtual Reality Tool/Robotics)

<table>
<thead>
<tr>
<th>Time</th>
<th>Presentation Title</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>1400</td>
<td>Omni-Directional Treadmill</td>
<td>Infinadeck</td>
</tr>
<tr>
<td>1430</td>
<td>The Robot Operating System (ROS) and the Gazebo Simulation Environment</td>
<td>Huntington Ingalls Industries</td>
</tr>
</tbody>
</table>

### Wednesday, 4 December – Session 4 (Augmented and Virtual Reality Tools)

<table>
<thead>
<tr>
<th>Time</th>
<th>Presentation Title</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>1600</td>
<td>Computer Vision on the Edge</td>
<td>MapBox, Inc.</td>
</tr>
<tr>
<td>1630</td>
<td>Disruptive Training Across the Spectrum of Use Cases Using Virtual Immersive Experiences</td>
<td>Enduvo</td>
</tr>
</tbody>
</table>
Professional Development
OPEN TO ALL ATTENDEES

I/ITSEC Tutorials are designed to serve three purposes:

1. Provide foundational educational material, including material essential in preparation as a Certified Modeling & Simulation Professional (CMSP).
2. Serve as a refresher and more advanced learning opportunity for those seeking to maintain their certification.
3. Bring topics of special interest in training, simulation and education to I/ITSEC attendees.

TUTORIALS SCHEDULE

<table>
<thead>
<tr>
<th>ROOM</th>
<th>TRACK/CHAIR</th>
<th>T0830 – 1000</th>
<th>T1245 – 1415</th>
<th>T1430 – 1600</th>
</tr>
</thead>
<tbody>
<tr>
<td>S320B</td>
<td>Track 1: Cutting Edge Ramona Shires, ND</td>
<td>A Comprehensive Introduction to Medical Simulation (1910)</td>
<td>M&amp;S Case Study Analysis: Design for Additive Manufacturing &amp; 3D Printing (1920)</td>
<td>Location, Location, Location: Big data, Artificial Intelligence and Analytics in the Cloud (1936)</td>
</tr>
<tr>
<td>S320F</td>
<td>Track 5: M&amp;S Fundamentals Mike Freeman</td>
<td>Introduction to DoD Modeling and Simulation (M&amp;S) (1923)</td>
<td>Addressing the Challenges of Rigorous Simulation Validation (1941)</td>
<td>Design of Experiments: Applications for the Simulation Profession (1918)</td>
</tr>
</tbody>
</table>
Simulation tools and techniques have been a part of acquiring medical knowledge and skills for over 4,000 years, with more scientific approaches emerging hand-in-hand with the European Renaissance. These devices were initially used as a means to convey homeopathic experience and the knowledge gained through cadaveric dissection. More recently, the devices have been computerized and restructured according to modern learning theories. This tutorial is a comprehensive overview of medical simulation to include “what’s new”, history, proposed system taxonomies, devices and techniques for representing external and internal anatomy and physiology for medical interventions, the role of team training, and criteria for current simulation accreditation programs. The tutorial concludes with a predictive view into the future of the devices and practices as outlined by forward thinkers in the field. This includes an understanding of the financial, cultural, and scientific forces which both aid and restrain the application of simulation in medicine. The story includes manikins, part-task trainers, surgical simulators, standardized patients, physical prostheses, team training events, and certifications. These categories are drawn from taxonomies initiated by the American College of Surgeons and the Society for Simulation in Healthcare. The tutorial concludes with a predictive view into the future of the devices and practices as outlined by forward thinkers in the field.

Presenters

ROGER SMITH, Ph.D., is currently the Chief Technology Officer for Trideum Corporation headquartered in Huntsville, Alabama. For the 7th time in 2019, Trideum has made the Inc. 5000 list of the fastest-growing private companies in America. Trideum focuses on four core competencies: Live, Virtual and Constructive (LVC) Interoperability, Test & Evaluation (T&E), Training Solutions & Engineering Analysis. Mr. Lessmann has supported the Modeling and Simulation (M&S) and LVC communities for the past 25 years where he has been involved in interoperability standards development and deployment for DIS, HLA and TENA. His primary focus has been applying M&S and LVC technologies to enhance weapons system test and evaluation effectiveness. He is currently focusing on developing solutions that provide an operationally realistic distributed LVC environment that support weapon system cybersecurity vulnerability assessments. He holds a Bachelor of Aerospace Engineering Degree from Auburn University, lives in Huntsville, Alabama, with his wife of over 25 years and their three children.

KURT LESSMANN is the co-founder and Chief Technology Officer of Trideum Corporation headquartered in Huntsville, Alabama. For the 7th time in 2019, Trideum has made the Inc. 5000 list of the fastest-growing private companies in America. Trideum focuses on four core competencies: Live, Virtual and Constructive (LVC) Interoperability, Test & Evaluation (T&E), Training Solutions & Engineering Analysis. Mr. Lessmann has supported the Modeling and Simulation (M&S) and LVC communities for the past 25 years where he has been involved in interoperability standards development and deployment for DIS, HLA and TENA. His primary focus has been applying M&S and LVC technologies to enhance weapons system test and evaluation effectiveness. He is currently focusing on developing solutions that provide an operationally realistic distributed LVC environment that support weapon system cybersecurity vulnerability assessments. He holds a Bachelor of Aerospace Engineering Degree from Auburn University, lives in Huntsville, Alabama, with his wife of over 25 years and their three children.

DAMON CURRY has 30 years experience in the simulation industry specializing in distributed training systems, 3D visualization, and 3D terrain. He helped start several successful simulation industry companies and is presently Pitch Technologies’ manager for business development in North America. Damon is co-inventor of a real-time image processing technique and a wireless video transmission method for virtual reality with one patent awarded and another patent pending. Prior to working in the simulation industry, he served 16 years with the US Air Force, including software engineering on cruise missiles and avionics engineering on the F-16. He is a graduate of The Ohio State University with a Bachelor of Science in Electrical Engineering.

The tutorial is intended for decision makers who have recently come in contact with distributed simulation and need a top-level understanding of Live, Virtual and Constructive (LVC) interoperability and the supporting standards, technology and processes. The purpose of this tutorial is to provide managers the necessary insight needed to support intelligent decision making. The tutorial will discuss the various domains of the technology and how it can potentially relate to their LVC needs. The tutorial provides a relevant use case as the mechanism to explain the concepts and the solutions required to achieve success. The tutorial will not be an in-depth technology review of LVC interoperability yet will provide sufficient management-level insight into interoperability solutions and standards like Distributed Interactive Simulation (DIS), High Level Architecture (HLA), and the Test and Training Enabling Architecture (TENA) product line.

Presenters

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The Test and Training Enabling Architecture (TENA) and the Joint Mission Environment Test Capability (JMETC) program provide an advanced set of interoperability software, interfaces, and connectivity for use in joint distributed testing and training. This tutorial will provide information about the how TENA works and why it is important to the test and training communities, with some comparison to other interoperability architectures. TENA provides testers and trainers software such as the TENA Middleware — a high-performance, real-time, low-latency communication infrastructure that is used by training range instrumentation software and tools during execution of a range training event. The standard TENA Object Models provide data definitions for common range entities and thus enables semantic interoperability among training range applications. The TENA tools, utilities, adapters and gateways assist in creating and managing an integration of range resources. The current version of the TENA Middleware, Release 6.0.5, is being used by the range community for testing, training, evaluation, and feedback and is be used in major exercises in the present. JMETC is a persistent test and evaluation capability throughout the US DoD, connecting many test ranges together, including a bridge to the JTEN training network; a set of TENA-compliant software middleware, interfaces, tools, and databases; and a process for creating large distributed test events. The combination of TENA and JMETC gives testers and trainers unprecedented power to craft a joint distributed mission environment that forges the future for innovative testing and training.

**Presenters**

**EDWARD T. POWELL, Ph. D.,** is a lead architect for the Test and Training Enabling Architecture. After receiving his Ph.D. in Astrophysics from Princeton University, he worked for the Lawrence Livermore National Laboratory performing simulation-based analysis. He moved to SAIC (now Leidos) in 1994, and participated as lead architect in some of the most complex distributed simulation programs in DoD, including the Joint Precision Strike Demonstration (JPSD), the Synthetic Theater of War (STOW), the Joint Simulation System (JSIMS). He then worked in the intelligence community on architectures for integrating large-scale diverse ISR systems. He has been the lead architect for TENA for fifteen years, and is currently working on expanding the applicability of TENA, and integrating TENA with broader DoD-wide Data Management and Big Data analysis systems. Currently, he owns his own consulting company specializing in Simulation and Systems Architecture and Engineering.

**JOSEPH BEEL** is the Senior Defense Strategist at Cisco Systems, Inc. He develops and implements strategies to support the U.S. Department of Defense. He is a retired naval officer who was a helicopter pilot and acquisition professional serving in command in both the Naval Air Systems Command and Space and Naval Warfare Systems Command (now Naval Information Warfare Command).

**KURT KOLLMANSBERGER,** Mr. Kollmansberger is a network engineer with over 27 years of networking experience; the last 20+ years at Cisco Systems. He currently supports DoD customers and partners also consults with other Federal agencies. He works with leading platform manufacturers and system integrators to enhance current DoD capabilities on airborne and sea/ground-based networks. He also works with test and training ranges on modernizing networks and building out support for LVC capabilities.

**JOSH TURNER** is a Technical Solutions Architect with Cisco Systems. He provides cybersecurity architect support to the U.S. Navy and U.S. Marine Corps. As a former Airmen in the U.S. Air Force, he has a strong grasp of how critical cybersecurity is to the overall mission to all MILDEPS. His cybersecurity experience includes Joint Interoperability Test Command and programs such as CANES, LCS, AEGIS and ADNS. He has a deep technical background in overall Comply to Connect for Network Access and Control, CsFC multi-party security integration, threat intelligence, secure tactical networks and cyber security training for the warfighters.
This tutorial will describe the fundamental technologies, terms and concepts associated with Modeling and Simulation (M&S) and describe M&S development and application in the Department of Defense (DoD). The tutorial will cover various aspects of M&S including key M&S terms and concepts that describe M&S technology, development, and application. It will include: (a) M&S terminology and concepts used in the DoD; (b) M&S technology, architectures and interoperability protocols; (c) the processes for developing valid representations of DoD warfare capabilities, threat capabilities, cyber, natural environment, complex systems, and human/organizational behavior. The attendee will become familiar with how M&Ś is used in the DoD for operational purposes - especially training and other areas of direct warfare support; and the DoD M&S role in enabling key functions of the Department. This tutorial will identify key policies and procedures for DoD M&S, and present the critical role of Verification, Validation and Accreditation (VV&A) in ensuring that models and simulations meet the needs of their users. The tutorial will present the role of M&S Standards in the Defense Standardization Program, its role within the M&S framework, and its relationship with the Joint Information Enterprise (JIE) and cloud-based DoD IT. The tutorial will describe the characteristics and associated challenges of M&S applications within DoD functional areas with examples of: Training, Analysis, Acquisition, Test and Evaluation, Experimentation, Planning, and Intelligence. The tutorial will also identify accessible DoD M&S information resources and explain the role of the DMSCO as the focal point of DoD M&S information, practice, technology, and functional use.

Presenters
JOHN DALY is a senior engineer with Booz Allen Hamilton. He currently leads a team providing modeling and simulation technical and policy support to the Defense Modeling and Simulation Coordination Office. He has worked with OSD, Joint Staff, COCOM, Service, and DISA clients in the development of simulation systems for: training, acquisition, operational decision support, visualization of complex phenomena, testing, analysis, and operational simulation applications embedded in command and control systems.

JAMES E. COOLAHAN, Ph.D., is the Chief Technology Officer of Coolahan Associates, LLC, having retired from full-time employment at the Johns Hopkins University Applied Physics Laboratory (JHU/APL) He chaired the M&S Committee of the Systems Engineering Division of the National Defense Industrial Association from 2010 through 2016, and teaches courses in M&S for Systems Engineering in the JHU Engineering for Professionals M.S. program. He holds B.S. and M.S. degrees in aerospace engineering from the University of Notre Dame and the Catholic University of America, respectively, and M.S. and Ph.D. degrees in computer science from JHU and the University of Maryland, respectively.

There are increasing requirements for automated reasoning abilities across the broad spectrum of modeling and simulation, as well as in battlefield information and control systems. Additionally, the cognitive capabilities that have been developed and tested in simulation are migrating to real-world systems. Cognitive systems represent a maturing computational approach to intelligence that can provide robust, scalable, and adaptive decision making. This tutorial provides an introduction to cognitive systems, concentrating on production system computation and high-level design of human-like reasoning systems. We draw examples and comparisons from existing cognitive systems, focusing on the tradeoffs between cognitive and non-cognitive modeling approaches. The tutorial content does not require any specialized knowledge, but some experience with software engineering or behavior modeling can be helpful. Attendees will learn to recognize problems that suggest cognitively based solutions, and they will be better able to assess risks, costs, and benefits of different approaches. This tutorial is targeted toward developers who might be interested in cognitive approaches to software engineering, as well as customers who have problems that may be amenable to a cognitive approach.

Presenters
RANDOLPH M. JONES, Ph.D.—Senior artificial intelligence engineer and co-founder of Soar Technology, is a leading developer of knowledge-rich intelligent agent software. He has been principal investigator for a variety of advanced R&D projects funded by ONR, ARI, DMSO, DARPA and other DoD agencies. He has held teaching and research positions at Colby College, the University of Michigan, the University of Pittsburgh and Carnegie Mellon University. His areas of research include computational models of human learning and problem solving, executable psychological models and full-spectrum intelligent behavior models. He earned a B.S. in Mathematics and Computer Science at UCLA and an M.S. (1987) and Ph.D. (1989) degrees from the Department of Information and Computer Science at the University of California, Irvine.

DYLAN SCHMORROW, Ph.D.—Chief Scientist at Soar Technology, leads the advancement of research and technology tracks to build intelligent systems for defense, government, and commercial applications that emulate human decision making in order to make people more prepared, more informed, and more capable. He also serves as a Potomac Institute for Policy Studies Senior Fellow, Editor of the Theoretical Issues in Ergonomics Journal, and the Technical Advisor for the Applied Human Factors and Ergonomics Conference Series. He is one of the nation’s leading experts on national security research, technology, and policy related to information technology, medical research and human performance applications. Past service includes OSD, DARPA, NAWC, NRL, ONR, Naval Postgraduate School, and Executive Assistant to the Chief of Naval Research. Dr. Schmorrow holds a Ph.D. in Experimental Psychology from Western Michigan University, as well as M.S. degrees in Psychology and Philosophy. He retired from the U.S. Navy as a Captain in 2013, after 20 years of service.
Additive modes of product manufacturing, more commonly referred to as 3D Printing (3DP), are substantially altering the manner in which we approach subsystem component and design prototype conceptualization and generation. Lighter, stronger, and far more complex (i.e., both in terms of shape, and material) components can be achieved by leveraging these advanced technologies, and in a manner that is typically more process- and cost-efficient than traditional (subtractive) methods of manufacture. However, as these technologies continue to rapidly mature, the iterative pipeline between Conceptual Modeling, 3D digital Design, preliminary Rapid Prototyping, and end-product Manufacturing is continually evolving to improve process efficiency and overall rates of success. In this Tutorial, we feature four extensive 3DP Case Studies, each within separate domains of interest pertinent to Modeling & Simulation (M&S) (i.e., Military, Health Care, Aerospace, Entertainment) that emphasize the “Design for Additive Manufacturing (DFAM)” process pipeline. The Case Studies will be preceded by core introductory material for those new to Additive Manufacturing (AM) practice, including a targeted discussion of Fundamental printer, material, structural, and critically — COST considerations all interrelated to 3DP. Likewise, the associated impacts of emerging AM and 3DP technologies upon Training, Simulation, and Education — the three critical “pillars” of I/ITSEC — will be justified and emphasized throughout this emergent technology Tutorial.

Presenters

SOURABH SAPTARSHI is currently working as a Development/Quality Engineer for the New Product Industrialization department at Sumitomo Rubber Industries USA, LLC. He received his Master’s Degree in Industrial and Systems Engineering from University at Buffalo, SUNY, NY with specializing in manufacturing technologies. Sapatarshi has a bachelor’s degree in Mechanical Engineering and current areas of interest include 3D Printing and Design for Manufacturing (DFM).

KEVIN F. HULME, Ph.D., CMSP, received his Ph.D. from the Department of Mechanical and Aerospace Engineering at the University at Buffalo, specializing in multidisciplinary analysis and optimization of complex systems. Dr. Hulme’s current areas of technical focus include: game-based approaches for applied modeling and simulation (M&S), human factors research in autonomous and connected vehicles (both ground and flight), 3D Printing and Design for Additive Manufacturing (DFAM), and applied M&S and experiential learning within next-generation engineering curriculum design. In November of 2015, Dr. Hulme became a Certified Modeling and Simulation Professional (CMSP).

Integration and execution of large distributed Live, Virtual, Constructive (LVC) events consume substantial time and resources. While the underlying distributed LVC technologies are mature, the processes for integrating events are not. The IEEE Std 1730-2010 Distributed Simulation Engineering and Execution Process (DSEEIP) standard presents a process model for the development of an event. However, the user still has to instantiate the process and develop artifact templates. Based on the experience of the integration and execution of many distributed LVC events, an instantiation of two of the seven DSEEIP steps has been developed. This tutorial provides a detailed set of processes, templates, and guidance on how to perform step 5 Integration and Test Simulation Environment and step 6 Execute Simulation steps. The tutorial also describes how the products produced in the first 4 steps are used in the subsequent steps. The process covers the integration of simulations and tactical systems to meet the objectives of the LVC event. This tutorial is beneficial for anyone involved in the integration and execution of large distributed events. The tutorial is particularly beneficial for engineers tasked with planning and executing distributed events. The tutorial does not require knowledge of the DSEEIP standard.

Presenters

MICHAEL J. O’CONNOR is Chief Technologist at Trideum Corporation. Mr. O’Connor has more than 25 years’ experience in Modeling and Simulation (M&S). He has been a key participant in the development of distributed modeling and simulation standards, including IEEE 1278 and IEEE 1516. He has held many positions in the community, including Chairman of the SISO Standards Activities Committee and is currently the Chairman of the SISO Executive Committee. He has served as the chair of the I/ITSEC Simulation Subcommittee the I/ITSEC Training Subcommittee. He has led the development of multiple simulations using DIS, HLA, and TENA. Mr. O’Connor has led the technical integration of several large multi-architecture distributed events. He holds a bachelor’s degree in Computer Engineering from Auburn University, and a master of science in Computer Science from the University of Alabama in Huntsville. Mr. O’Connor is a CMSP.

KENNETH G. LeSUEUR, Ph.D., serves as the chief technologist of the Modeling & Simulation Division at the U.S. Army Redstone Test Center (RTC). His work and research have been concentrated in HWIL testing, distributed testing, modeling and simulation, and high performance computing. He received his master’s degree and doctorate in computer engineering at the University of Alabama in Huntsville.
The Distributed Interactive Simulation (DIS) protocol is a well-established IEEE standard for packet-level exchange of state information between entities in military simulations. DIS facilitates simulation interoperability through a consistent over-the-wire format for information, widely agreed upon constant enumeration values, and community-consensus semantics. Anyone can obtain the IEEE-1278 standard and implement their own compliant, interoperable, DIS application. A large variety of tools and codebases simplify this effort, and enable multi-architecture integration of simulations using the DIS stand baseline. DIS focus begins with real-time, physics-based, entity-scale simulations, providing state update and interaction mechanisms which can scale to large virtual environments. This tutorial is a “DIS 101” introduction for software implementers and an introduction to the DIS philosophy for simulation systems integrators. Examples are provided using the open-source Open-DIS library for DIS v7 support, available in multiple programming languages. Ongoing work is included in WebRTC browser streaming, unit testing of DIS streams, and Web-based implementations using 2D maps and X3D Graphics.

Presenters
DON BRUTZMAN Ph.D., is a computer scientist and associate professor working in the Modeling Virtual Environments & Simulation (MOVES) Institute at the Naval Postgraduate School (NPS) in Monterey, California. A shared theme across all his projects is establishing Web-scale distributed simulation capabilities. Currently he co-chairs the Extensible 3D (X3D) Working Group for the Web3D Consortium. He wrote the book X3D Graphics for Web Authors with co-author Leonard Daly, published April 2007 by Morgan Kaufmann. He is a retired naval submarine officer and principal investigator for the Network Optional Warfare (NOW) project. His research interests include underwater robotics, real-time 3D computer graphics, artificial intelligence, and high-performance networking.

CHRISTIAN FITZPATRICK, Naval Postgraduate School (NPS)
Addressing the Challenges of Rigorous Simulation Validation (1941)

The process of validation is essential to the credible and reliable use of any simulation. Although Department of Defense policy and guidance increasingly emphasizes the importance of rigorous validation founded in the application of strong statistical analysis, implementation of rigorous validation continues to face multiple challenges. This tutorial will address several of those challenges:

• How to identify, collect, and combine validation referent data (what the simulation results will be compared to)
• How to identify the simulation measures and metrics to use as the basis of comparison (the aspects of the results that will be compared to the referent)
• Methods to apply when performing the results/referent comparison
• How to quantify risk and residual uncertainty associated with the application of the simulation

The tutorial will enhance the learning experience by incorporating lessons learned derived from the many VV&A applications with which the authors have been involved.

Presenters

SIMONE M. YOUNGBLOOD is a member of the Johns Hopkins Applied Physics Laboratory’s Principal Professional Staff. Leveraging an extensive background in simulation development and credibility assessment, she has served as the DoD V&V focal point for the past 25 years. Ms. Youngblood was the editor of the DoD V&V & Accredited Practices Guide and chaired the development of several V&V related standards including: IEEE Standard 1278.4, IEEE Standard 1516.4 and MIL-STD 3022. Ms. Youngblood has served as the V&V and/or Accreditation agent for numerous M&S efforts that span a broad organizational spectrum to include: PEO IWS 1, the Defense Threat Reduction Agency (DTRA), the Domestic Nuclear Detection Office (DNDO), the US Naval Air Systems Command, and the U.S. Army Medical Research and Material Command. Ms. Youngblood has a B.A. in mathematics as well as B.S. and M.S. degrees in computer science.

MIKEL D. PETTY, Ph.D., is currently a Senior Scientist for Modeling and Simulation at the University of Alabama in Huntsville’s Information Technology and Systems Center and an Associate Professor of Computer Science. Prior to joining UAH, he was Chief Scientist at Old Dominion University’s Virginia Modeling, Analysis, and Simulation Center and Assistant Director at the University of Central Florida’s Institute for Simulation and Training. He received a Ph.D. in Computer Science from the University of Central Florida in 1997. Dr. Petty has worked in modeling and simulation research and education since 1990 in areas that include verification and validation methods, simulation interoperability and composability, and human behavior modeling.

Artificial Intelligence: Past, Present, Capabilities and Limitations (1919)

Many in the political, industrial and defense communities are expecting current artificial intelligence to solve a wide array of problems in both defense and industry. This reaction is not surprising given that deep neural networks and deep learning systems have been remarkably successful at tasks long believed to require high levels of (human) intelligence. The availability of large amounts of appropriately labeled training data and the continued growth in sheer computing power permit the decades-old technologies to now reach impressive performance levels. These success stories beg answers to questions about the limits of performance and potential. The tutorial describes artificial intelligence in its historical context of boom and bust cycles. The AI discipline has a 60-year record of remarkable achievements that were followed by disillusionment (“AI Winters”) when the technologies failed to satisfy popular expectations or generalize to wider application. The tutorial develops parallels between the current deep neural network requirements for success and those of previous intelligent technologies that were once inspiring but are now less widely used. The tutorial also examines the state-of-the-art of methods and tools for testing AI-enabled autonomous unmanned systems. The tutorial is open to any who would benefit from an overview of AI to develop an appreciation of the larger context surrounding current achievement. It is not intended to teach use of available deep learning utilities or to provide detailed information about constructing deep neural networks.

Presenter

ROBERT RICHBOURG, Ph.D. is a member of the Research Staff at the Institute for Defense Analyses. He has over 20 years of experience in the development, use, and management of models and simulations across all phases of the Department of Defense (DoD) systems acquisition process. Mr. Lutz currently serves in technical leadership positions on several science and technology programs. In addition, Mr. Lutz serves as the Chair of the Simulation Interoperability Standards Organization (SISO) Board of Directors and Vice Chair of the SISO Executive Committee, serves on the I/ITSEC Tutorial Board and Fellows Committee and is a guest lecturer on various M&S-related topics in The Johns Hopkins University Whiting School of Engineering.

ROBERT LUTZ is the Chief Engineer of the Intelligent Combat Platforms Group at the Johns Hopkins University Applied Physics Laboratory. He has 39 years of practical experience in the development, use, and management of models and simulations across all phases of the Department of Defense (DoD) systems acquisition process. Mr. Lutz currently serves in technical leadership positions on several science and technology programs. In addition, Mr. Lutz serves as the Chair of the Simulation Interoperability Standards Organization (SISO) Board of Directors and Vice Chair of the SISO Executive Committee, serves on the I/ITSEC Tutorial Board and Fellows Committee and is a guest lecturer on various M&S-related topics in The Johns Hopkins University Whiting School of Engineering.
Following last year’s tutorial on Machines Crave Big Data that outlined Big Data, Machine Learning, and Artificial Intelligence, we continue the journey with a tutorial on developing and hosting analytics in the cloud. Cloud technology is rapidly changing the way the organizations design and operationalize their artificial intelligence projects and the DoD has begun small scale adoption with a massive enterprise cloud environment in the next year. These movements and changes will help revolutionize training, simulation, and education. In this tutorial, we will cover: options on hosting your analytic environments to include on-premise, public cloud, and private cloud; discuss advantages to adopting and operationalizing a cloud environment for your analytic needs; provide an overview of cloud architectures to support the whole life-cycle of analytics from the storage of data to abstraction layer for your analyst workforce; discuss open-source and cloud vendor analytics tools that can be deployed to help meet artificial needs around computer vision, natural language processing, and machine learning; provide real-life examples from the U.S. Army’s Training and Doctrine Command (TRADOC) G-2 experiences with implementing cloud-based analytic solutions; and last but not least, we will provide an industry overview on future trends for the use of cloud technologies to enhance training, simulation and education.

**Presenters**

**JOE ROHNER** is a Director or Artificial Intelligence and Data Science and leads Booz Allen’s Strategic Innovations Group on the West Coast where he is responsible for the development and application of advanced analytics solutions. In this role, Joe leads a growing team of more than 50 analytic professionals across San Diego, Los Angeles, Ventura, and Seattle. Joe has been responsible for executing efforts across the West coast in advanced analytics that have included the application of Data Science, AI, and Robotic Process Automation (RPA) for a range of Navy clients that resulted in significant insights and organization efficiencies. Additionally, Joe was recently selected to lead The Data Science Bowl®, presented by Booz Allen and Kaggle. This is the world’s premier data science for social good competition. The 90-day online event brings together more than 20,000 data scientists, technologists, domain experts and organizations to generate solutions for the world’s most pressing problems, such as human diseases and ocean health.

**KAYE DARONE,** U.S. Army Training and Doctrine Command, is the Lead for Data Science and the Deputy for Information Management at the TRADOC Directorate of Intelligence (G-2), headquartered at Ft. Eustis VA.

Recent innovations within the networking industry are converging to greatly enhance the distributed simulation environment and set the foundation for achieving the full LVC objective state. Future distributed network architectures leverage hardware innovations that include converged compute, storage, and transport management functions and device virtualization that allows a single device to perform multiple roles i.e. routing, switching, and security appliances. Innovation in network and security operations include advances in software defined networking, development of agile identity and access management, and the incorporation of real-time network and security policy compliance and application performance visibility functions. Further, the use of National Security Agency approved Commercial Solutions for Classified voice and data transport simplify implementation of multi-level security operations inherent in distributed simulation and LVC.

Emerging network architectures and evolving operating practices create operational effects at a lower capital and operating cost. Resource utilization can be dynamically adjusted to suit the function at hand. During a simulation sequence, load surges can be distributed via to ensure quality of service required to achieve the realism demanded as hundreds, thousands, or tens of thousands of entities interact within physics-based models.

Automation and real-time security policy implementation support live, virtual, and constructive entity pairings in large-scale sessions. Automation is key to access and security policy compliance assurance that is a prerequisite for dynamically paired entity interactions taking place simultaneously on multiple levels including flight or ground path interaction, multi-spectrum signature representation, multi-spectrum detection representation, and multi-spectrum weapons and countermeasure interaction characteristics.

The future LVC network environment will effectively resemble a highly distributed high-performance computing center. Multiple networks will join together on a session basis to support high intensity, many-to-many interactions on multiple, segregated classification planes. In this environment, ensuring the moment-by-moment integrity of the architecture and computational operations through multi-epoch scenarios is a must. Both are possible with visibility functions that continuously run checks and balances verifying the integrity of the simulation.

**Presenters**

**CHUCK LOUISELL,** Ph.D., is a strategic programs manager at Cisco Systems, Inc. A prior USAF Weapons School instructor and Unit Commander, Chuck works across data center and cloud product lines. GRIMT HABTEMARIAM is the Federal Cloud Strategist for Cisco Systems Inc. She has held multiple roles throughout her career all focused on helping organizations leverage technology to transform their operation, improve their competitive posture and deliver new value. Grimt holds a BS in Computer Science from Meredith College and an MBA from Duke University.

**CHUCK OTTS** is a Data Center Product Specialist for the Federal-Defense Area at Cisco Systems, Inc. He primarily works with the US Air Force and System Integrators providing technical guidance on the future direction of data center architectures and software defined solutions. Chuck works with US Air Force customers helping to identify technical requirements and develop next generation modern network architecture designs that exploit the capability of converged and virtualized data center functions within a mission context. Most recently, he has guided the inclusion of distributed data center functionality in the networks that support recapitalization of unmanned aerial systems ground stations. Through his career at Cisco, Chuck has served both federal and commercial organizations.
Introduction to HLA

The High-Level Architecture (HLA) is the leading international standard for simulation interoperability. It originated in the defense communities but is increasingly used in other domains. This tutorial gives an introduction to the HLA standard. It describes the requirements for interoperability, flexibility, composability and reuse and how HLA meets them. It also describes the new features of the most recent version: HLA Evolved (IEEE-1516-2010) and the upcoming HLA version (HLA 4). Finally, it provides some recent experiences of the use of HLA in NATO M&S groups as well as an overview of recent evolution of Federation Object Models for military platform simulation. This tutorial is intended for all audiences; however, some familiarity with basic principles of distributed computing is recommended.

Presenters
BJÖRN MÖLLER is the president and co-founder of Pitch Technologies, the leading supplier of tools for HLA and other simulation standards. He received an M.S. in computer science and technology after studying at Linköping University and Imperial College, London. Mr. Möller has more than thirty years of experience in high-tech R&D companies, with an international profile in modeling and simulation. His experience includes positions in SISO and IEEE standards development groups such as vice chair for HLA, chair of the Real-time Platform Reference FOM and chair of the Space Reference FOM. Mr. Möller also served as secretary in the NATO MSG-080 group for Security in Collective Mission Training.

ROBERT LUTZ is the Chief Engineer of the Intelligent Combat Platforms Group at the Johns Hopkins University Applied Physics Laboratory in Laurel, Maryland. His background includes 39 years of practical experience in the development, use, and management of models and simulations across all phases of the Department of Defense (DoD) systems acquisition process. Mr. Lutz currently serves in technical leadership positions on several autonomy science and technology (S&T) programs, such as the Safe Testing of Autonomy in Complex Interactive Environments (TACE) project. In addition, Mr. Lutz serves as the Chair of the Simulation Interoperability Standards Organization (SISO) Board of Directors and Vice Chair of the SISO Executive Committee; serves on the Tutorial Board and Fellows Committee at the Interservice/Industry Training, Simulation, and Education Conference (I/ITSEC); and is a guest lecturer on various M&S-related topics in The Johns Hopkins University Whiting School of Engineering.

Simulation Conceptual Modeling Theory and Use Cases

Simulation conceptual modeling is a critical step in simulation development frequently overlooked in the rush to demonstrate program progress. A simulation conceptual model is an abstraction from either the existing or a notional physical world that serves as a frame of reference for further simulation development by documenting simulation-independent views of important entities and their key actions and interactions. A simulation conceptual model describes what the simulation will represent, the assumptions limiting those representations, and other capabilities needed to satisfy the stakeholder’s requirements. It bridges between these requirements, and simulation design. This tutorial will present the theory and application of simulation conceptual modeling as documented during the research done by the NATO MSG 058. In addition, Use Cases that have been drawn from previous conference presentations will be presented to illustrate how conceptual modeling has been performed. Additional work is necessary to mature the state-of-the-art of simulation conceptual modeling before a recommended practices guide could be standardized. This tutorial has been created to continue the maturation of the simulation conceptual modeling best practices.

Presenter
JAKE BORAH is the co-owner of Borah Enterprises LLC. He is a Senior Simulations/Learning Architect for the U.S. Army PM ITTS Persistent Cyber Training Environment. Jake is a Charter Certified Modeling and Simulation Professional (CMSP). He has frequently supported U.S. and Canadian government sponsored military simulation projects because of his mastery of the M&S technology, and expertise in High Level Architecture federation development. Jake has a B.S. from the United States Air Force Academy and a Master of Aeronautical Science degree from Embry-Riddle Aeronautical University.
Design of Experiments: Applications for the Simulation Profession

The Department of Defense (DoD) is currently evaluating ways to accelerate acquisition and test and evaluation (T&E) in order to field more effective weapon systems sooner. DoD is also seeking ways to improve models of selected weapons systems in simulations for test and for training. Design of Experiments (DOE) can assist DoD in accelerating the development of combat systems, increasing precision, and improving the validity of simulations. DOE is used to calculate relatively accurate models of a system quickly, identify the most significant inputs (factors), and characterize how the system performs in the region modeled. DOE is used to improve the quality of consumer products or defense systems, find optimal solutions, and calculate settings to hit targets consistently. DOE is also used to accelerate the vulnerability scans and reduce the number of cybersecurity experts required to fully analyze a system’s cyber threat landscape. DOE is a rapid modeling method that provides new types of information to simulation developers. This tutorial will discuss the upfront analysis steps for the DOE process, key benefits of using DOE, and typical use cases. These use cases include development of functional representations of systems in order to characterize how the systems perform within the region modeled. The tutorial will illustrate how DOE models can be used to define a relationship between inputs and outputs for the purpose of analysis, early prototyping, tradespace studies, simulation, evaluation, and optimization. For one radar system, DOE was shown to produce more information than any previous testing methods, while using only 10 percent of the previously-required test resources. This was truly a unique example of faster, better, and cheaper. Use cases such as model-based systems engineering, test and evaluation, cybersecurity, and validation of models will be discussed. There are no requirements for mathematical or statistical knowledge for attendees of this tutorial.

Presenter
STEVEN GORDON Ph.D., is the Orlando Field Office Manager and a Principal Research Engineer for Georgia Tech Research Institute. He served 26 years in the U.S. Air Force with tours as an F-111 Weapons Systems Officer, Instructor, and Wing Electronic Warfare Officer; Air Staff Division Chief; 13th Air Force Director of Operations and Air Operations Center Director; and Air Force Academy Department of Mathematics Professor and Head. He also served as the first Technical Director for the Air Force Agency for Modeling and Simulation. Dr. Gordon has a Bachelor’s Degree in Mathematics (Marymount); Master’s Degrees in Education (Peabody/Vanderbilt), Industrial Engineering/Operations Research (Purdue), and in Business (Florida); and a Ph.D. in Aero and Astro Engineering (Purdue). His research interests include return on investment for simulation-based training, tradespace tools for training systems, statistical techniques for test and evaluation, and decision support tools for military operations.

Superforecasting: Proven Practices for Leveraging Human Ingenuity

Those of us who work for the military in some capacity are well aware of the emphasis placed on lessons learned. There is great wisdom in the practice of reflecting on our experiences for building a better future in a complex world. When we truly learn a lesson, we incorporate it into our practices to advance our knowledge and capability, and to improve our simulation products. But what of lessons unlearned, those things we have tripped over, documented, forgotten and thus have tripped over again? Is there a role for them? What about our failures, the ones we hesitate to celebrate in papers and presentations? Are we neglecting a valuable resource? Are there other practices available to help us throughout the process of creating and using modeling and simulation for training (and other purposes as well)? Enter the notion of superforecasting.

In 2010, the Intelligence Advanced Research Projects Agency (IARPA) issued a Broad Agency Announcement (BAA) entitled Aggregative Contingent Estimation (ACE) with the goal of dramatically enhancing the accuracy, precision and timeliness of intelligence forecasts for a wide range of event types. Among the participants, a newly developed program, the Good Judgment Project (GJP), aimed at harvesting the “wisdom of the crowd” while simultaneously examining the performance of participating individuals. About 2% of the 250 individuals in the “crowd” emerged as superforecasters who beat the benchmarks by as much as 30%. That result would be of little interest, except that superforecasting capability can be trained. The thrust of this tutorial is an examination of how the thought patterns for superforecasters could influence how we work as program managers, technologists and trainers to improve our products and perhaps contribute to training more effective, agile military leaders. And, yes, unlearned lessons are telltale symptoms of not thinking like superforecasters. But imagine where we could take our industry if we could improve by only 10% our ability to make better judgments and assess more accurately potential futures.

Presenter
S.K. NUMRICH (Sue), Ph.D., CMSP, has contributed to the science and technology of Modeling and Simulation for over 50 years. She began her career at the engineering level of modeling and simulation and moved gradually into parallel and distributed simulation. She was selected by the Office of Naval Research, to represent the Science and Technology (S&T) community as part of the Navy’s Modeling and Simulation Management Office, a position that broadened her knowledge base to simulation used for training, acquisition, analysis and support to operations. She developed and led a panel for The Technical Cooperation Program (US, UK, CA, AUS, NZ) in distributed simulation as an area of international interest. She represented the U.S. on the NATO Studies, Analysis and Simulation (SAS) panel as the simulation expert. Her last three years as a civil servant, Sue served as the Director of Technology for the Defense Modeling and Simulation Office where she was exposed to simulation across the whole of the Department of Defense. Since 2005 she has been a research staff member at the Institute for Defense Analyses where she has contributed to studies in the use of military simulation, the incorporation of human activity and behavior into various types and levels of simulation, and the validation of a variety of simulations. Sue joined the I/ITSEC community as part of Simulation and later ECT. She founded and was the first chair of the Tutorial Board, now a staple of I/ITSEC week. Along the way Sue became a Fellow of the Acoustical Society of America, was selected as the I/ITSEC 2018 Fellow, wrote four book chapters, over 50 technical papers and has two Academic appointments spanning twenty years.
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Bill Gerber, Ph.D. | Implementation of a “True” Flipped Classroom Concept at the Norwegian Defense University College (19116) | Avoiding Pitfalls in Undergraduate Simulation Courses (19168) | An Evidence-Based Methodology for Evaluating the Community Impacts of a Science, Technology, Engineering and Mathematics (STEM) Instructional Program (19220)
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John Burwell | Human-liked Auditory Capability for Intelligent Virtual Agents (19125) | Mid-air Haptics in Aviation (19184) | Utilizing Augmented Reality for Air Force Maintenance Training (19329)
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Angela Alban | Lessons Learned in the Experimental Use of Simulated Malodors to Support Live Training (19107) | Adapting Existing Simulation Architectures to Enhance Tailored Instruction (19239) | Tactical Decision Kits for Infantry Training (19341)
S320C | **P4 Big Data**  
Mike Merritt | Access Control in the Era of Big-Data Driven Models and Simulations (19115) | Privacy Challenges in DoD Big Data Analytics (19210) | Cybersecurity Strategies for Accrediting Experience API (19308)
S320D | **ED2 Transforming Military Learning**  
Kelly Hale, Ph.D. | Implementing Change for Greater Learning, Readiness and Lethality (19289) | A Once in a Generation Opportunity to Transform RAF Training (19294) | Twenty-Five Emerging Trends in Learning and Their Implications for Military Partners: An International Study (19299)
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S320GH | **BP1 Best Papers**  
Chuck Wythe | ECIT – Reinforcement Learning for Automated Textual Reasoning (19150) | Education – Enhancing Learning Outcomes through Adaptive Remediation with GIFT (19275) | HPAE – Simulating Augmented Reality Spatial Accuracy Requirements for Target Acquisition Tasks (19343)
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<td>Thomas Yanoschik, CMSP</td>
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<td>Annette Robinson</td>
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**BP1**  WEDNESDAY • 4 DECEMBER • 1030 • ROOM S320GH

**Best Papers**

**Session Chair:** Chuck Wythe, Cape Henry Associates

**Emerging Concepts & Innovative Technologies – Reinforcement Learning for Automated Textual Reasoning (19150)**

David Noever, Joseph Regian, PeopleTech, Inc.

**Education – Enhancing Learning Outcomes through Adaptive Remediation with GIFT (19275)**

Randall Spain, Jonathan Rowe, James Lester, North Carolina State University; Benjamin Goldberg, Ph.D., CCDC - Soldier Center, Simulation and Training Technology Center; Bob Pokorny, Ph.D., Intelligent Automation, Inc.

**Human Performance, Analysis and Engineering – Simulating Augmented Reality Spatial Accuracy Requirements for Target Acquisition Tasks (19433)**

John Graybeal, Ph.D., Todd Du Bosq, U.S. Army CCDC CSISR Center Night Vision and Electronic Sensors Directorate; Rachel Nguyen, KINEX, Inc.

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**BP2**  WEDNESDAY • 4 DECEMBER • 1400 • ROOM S320GH

**Best Papers**

**Session Chair:** Jeremy Lanman, Ph.D., U.S. Army PEO STRI

**Policy, Standards, Management and Acquisition – Effects of Bottlenecks within Military Training Pipelines (19145)**

Robert Floyd, Royal Navy

**Training – Advise When Ready for Game Plan: Adaptive Training for JTACs (19105)**

Matthew Marraffino, Ph.D., Cheryl Johnson, Ph.D., Natalie Steinhauser, NAWCTSD; Daphne Whitmer, Zenetex, LLC; Adam Clement, EWTPAC N75C

**Simulation – Fully Automated Photogrammetric Data Segmentation and Object Information Extraction Approach for Creating Simulation Terrain (19245)**

Meida Chen, Andrew Feng, Kyle McCullough, Pratasha Bhuvana-Prasad, Ryan McAlinden, University of Southern California Institute for Creative Technologies; Lucio Soibelman, University of Southern California Civil and Environmental and Engineering Department

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**BP3**  TUESDAY • 3 DECEMBER • 1400 • ROOM S320D

**Best from Around the Globe**

**Session Chair:** Amanda Davies, Ph.D.

**MODSIM World Best Paper: Simulation-Based Training’s Incorporation of Machine Learning**

Ivar Oswalt, Ph.D., CMSP, The MIL Corporation; Tim Cooley, Ph.D., DynamX Consulting

**ITEC Best Paper: Making The Invisible Visible: Increasing Pilot Training Effectiveness By Visualizing Scan Patterns of Trainees Through AR**

Jeanine Vlasblom, Netherlands Aerospace Centre NLR

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**EC1**  TUESDAY • 3 DECEMBER • 1400 • ROOM S320A

**Emerging Concepts & Innovative Technologies**

**Session Chair:** Scott Schutzmeister, Institute for Defense Analyses

**Session Deputy:** David “Fuzzy” Wells, Ph.D., CMSP, UCF/IST

**A Cyberspace Electromagnetic Activities (CEMA) Framework for M&S (19193)**

Clark Heidelbaugh, Trideum Corporation; Nathan Vey, U.S. Army CCDC-SC; Chad Bates UTC, Ph.D., U.S. Army Cyber Command; Jim Ruth, Mark Riecken, Tim Friest, Trideum Corporation

**A Roadmap to Achieve Cyber Modeling & Simulation Interoperability (19314)**

Derek Bryan, Ingenia Services, Inc.; David “Fuzzy” Wells, Ph.D., CMSP, UCF/IST; Jim Ruth, Trideum Corporation; Sara Meyer, 453d Electronic Warfare Squadron; Katherine Morse, Ph.D., CMSP, JHU/APL

**Simulate Effects of Cyberspace Electromagnetic Activities (CEMA) in Mission Command Systems (19257)**

Nathan Vey, U.S. Army CCDC-SC; Allen Geddes, Lawrence Elliott, Paul Tucker, Dynamic Animation Systems

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**EC2**  TUESDAY • 3 DECEMBER • 1600 • ROOM S320A

**Learning Building Blocks**

**Session Chair:** Tim Woodard, NVIDIA

**Session Deputy:** Wendy Johnson, Ph.D., USAF HQ AETC

**Building the World - Could AI Build Our Synthetic Environments? (19180)**

Graham Long, Thales

**Reinforcement Learning for Computer Generated Forces Using Open-Source Software (19197)**

Johan Källström, Saab; Fredrik Heintz, Linköping University

**Use of Natural Language Processing to Extract Technical Competency Frameworks from Maintenance Task Analyses (19255)**

Wayne Gafford, Department of Defense, U.S. Navy; Jeanne Kitchens, Southern Illinois University Center for Workforce Development; Fritz Ray, Eduworks Corporation

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**EC3**  WEDNESDAY • 4 DECEMBER • 0830 • ROOM S320A

**Virtual Care Is Real**

**Session Chair:** M. Beth Pettitt, Army

**Session Deputy:** Tyson Kackley, MCSC DC, SEAL, M&S Division

**Toward the Development of a Medical Simulation Training Architecture (MSTA) (19219)**

Harald Scheirich, SimQuest LLC; Jeffrey Beaubien, Ph.D., Aptima, Inc.; Rodney Metoyer, BioMojo; Gianluca De Novi, Ph.D., Massachusetts General Hospital/Harvard Medical School; Timothy Kelliher, SimQuest

**Development and Demonstration of Augmented Reality Forward Surgical Care (19301)**

Brandon Conover, Ph.D., Jerry Heneghan, BioMojo LLC; Tyler Harris, Womack Army Medical Center; Geoffrey Miller, Telemedicine & Advanced Technology Research Center (TATRC)

**The Application of Augmented Reality for Immersive TC3 Training (19379)**

Alyssa Tanaka, Jeffrey Craighead, Ph.D., Glenn Taylor, Soar Technology

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**THE WORLD’S LARGEST MODELING & SIMULATION EVENT**

63
See Me, Hear Me, Touch Me
Session Chair: John Burwell, Varjo Technologies
Session Deputy: Joseph Mercado, NAWCTSD

Human-like Auditory Capability for Intelligent Virtual Agents (19125)
Hung Tran, CAE USA

Mid-air Haptics in Aviation (19184)
Alex Girdler, Collins Aerospace; Orestis Georgiou, Ultrahaptics

Utilizing Augmented Reality for Air Force Maintenance Training (19329)
Charis Horner, Christina Padron, Design Interactive, Inc.; Troy Westbrook, Josh Davidson, USAF AETC 367 TRSS

Towards a Rationalization and Valuation Methodology for Training & Simulation Capabilities (19292)
Manfred Roza, Jelke Van der Pal, Michel Van Eenige, Netherlands Aerospace Center NLR

LVC-Enabled Range Technology: Supporting Training for Next-Gen Weapons Systems (19332)
Craig Smith, Angus McLean, Ryan Littler, Collins Aerospace

Perception Is Reality
Session Chair: Harry Sotomayor, U.S. Army PEO STRI
Session Deputy: Paul Bogard, USAF AFLCMC

Augmenting Cyber Assessment through Dynamic Malware Analysis (19249)
Ambrose Kam, Lockheed Martin; Charles Johnson-Bey, Michael Nance, Lockheed Martin Cyber Innovations; Wenke Lee, Kuyumg Park, Carter Yagemann, Georgia Tech

Visualizing Electromagnetic Spectrum Phenomena in Augmented Reality (19298)
Michael Longtin, Robert Hernandez, Richard Schaffer, sMark Wager, Lockheed Martin

AI in the Kill Chain
Session Chair: Marcus Boyd, L3Harris Technologies, Inc., Link Training & Simulation
Session Deputy: Chuck Breed, Ed.D., Zenetex LLC – Training Division

The Value of Cognitive Workload in Machine Learning Predictive Analytics (19147)
Amy Dideriksen, Joseph Williams, Avdic-McIntire Gianna, Collins Aerospace; Thomas Schnell, University of Iowa Operator Performance Lab

Emerging Innovations for Next Generation Mission Planning and Debrief (19253)
Joshua Ziegler, Kevin Gluck, Ph.D., Air Force Research Laboratory

Man-Machine Interoperability in Training for Large Force Exercise Air Missions (19372)
Patrick Craven, Ph.D., Kevin Landers, Lockheed Martin; Ankit Shah, Julie Shah, MIT CSAIL

New Thinking about How Machines “Think”
Session Chair: Byron Harder, Ph.D., TECOM (RTPD)
Session Deputy: Diane Justice, USAF AFLCMC

Adaptive Nonconvex Optimization for Artificial Intelligence, Machine Learning and Quantum Computing (19109)
Randal Allen, Ph.D., CMSP, Lone Star Analysis

Interpretable Network Architectures for Machine Learning (19149)
Randal Allen, Ph.D., CMSP, Lone Star Analysis

Prognostic Health Management Using Semi-supervised Machine Learning (19164)
George Hellstern, Anastacia MacAllister, Ph.D., Jordan Belknop, Danielle Clement, Ph.D., Stephen Summers, Lockheed Martin Corporation

Emerging Models for Training Value and Infrastructure
Session Chair: Gordon King, RSI Visual Systems
Session Deputy: Brian Stensrud, Soar Technology

The Foothold in the War of Cognition: The Operational Training Infrastructure Enterprise System Model (19226)
Christopher Reed, U.S. Air Force

Towards a Rationalization and Valuation Methodology for Training & Simulation Capabilities (19292) ✗
Manfred Roza, Jelke Van der Pal, Michel Van Eenige, Netherlands Aerospace Center NLR

LVC-Enabled Range Technology: Supporting Training for Next-Gen Weapons Systems (19332)
Craig Smith, Angus McLean, Ryan Littler, Collins Aerospace
**ED2** WEDNESDAY • 4 DECEMBER • 1030 • ROOM S320D

**Transforming Military Learning**

**Session Chair:** Kelly Hale, Ph.D., Draper Laboratory  
**Session Deputy:** Brian Overy, Aechelon Technology

**Implementing Change for Greater Learning, Readiness and Lethality (19289)**  
Kendy Vierling, Ph.D., USMC, TECOM / Future Learning Group

**A Once in a Generation Opportunity to Transform RAF Training (19294)**  
Audrey Caldeira-Hankey, Defence Science Technology Laboratory (Dstl) UK MOD; Helen Dudfield, QinetiQ; Lindsay Sargent, HQ Air Command

**Twenty-Five Emerging Trends in Learning and their Implications for Military Partners: An International Study (19299)**  
Sae Schatz, Ph.D., Advanced Distributed Learning (ADL) Initiative

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**ED3** WEDNESDAY • 4 DECEMBER • 1400 • ROOM S320D

**Evaluation of XR Tools**

**Session Chair:** Aaron Judy, NAWCTSD  
**Session Deputy:** Kevin Oakes, SAIC

**Increasing XR Technology’s Return on Investment Through Media Analysis (19327)**  
Martin Bogan, Scott Bybee, CAE USA; Jay Bahlis, BNH Software

**Air University Multi-modal Research Course on VR/AR and Related Technologies (19388)**  
Col Tony Millican, Ph.D., Dennis Armstrong, Ph.D., Air University

**Evaluation of sUAS Education and Training Tools (19136)**  
Brent Terwilliger, Ph.D., Christian Janke, Kristy Kiernan, Joseph Cerreta, Embry-Riddle Aeronautical University; Andrew Shepherd, Ph.D., Sinclair College National UAS Training and Certification Center

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**ED4** WEDNESDAY • 4 DECEMBER • 1600 • ROOM S320D

**Tools for M&S Educators**

**Session Chair:** Anastacia MacAllister, Ph.D., Lockheed Martin Corporation  
**Session Deputy:** Angie White, Integration Innovation, Inc.

**Track Mobile Learning with Secure Access Using xAPI and CAC (19102)**  
Paul Miller, Ilya Voloshin, LSI, Inc.

**Conducting Training and Simulation Research: A Primer for Practitioners (19179)**  
Philip Temby, Susannah Whitney, Defence Science and Technology

**Neuro-Designer: Informing The Development of Learning Solutions Through Application of Neuro Metrics (19266)**  
Adam Hall, Nervanix, LLC; Stephen J. Kenton

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**ED5** THURSDAY • 5 DECEMBER • 1030 • ROOM S320D

**21st Century Learning**

**Session Chair:** Sae Schatz, Ph.D., Advanced Distributed Learning (ADL) Initiative  
**Session Deputy:** Christina Welch, Naval Air Warfare Center Training Systems Division

**Cognitive Weaponry: Optimizing the Mind (19380)**  
JJ Walcutt, Ph.D.

**Establishing Engaged Social Learning Communities: Formation and Sense Making (19326)**  
Julian Stodd, Sea Salt Learning

**Transforming the Operational Mindset: Self-regulating Cognitive Performance Enhancement Strategies (19310)**  
Denise Stevens, Heather Seiser, Karen Tovar, Christa Bohannon, Dennis Lyons, General Dynamics Information Technology

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**ED6** THURSDAY • 5 DECEMBER • 1330 • ROOM S320D

**Start Making Sense: Strengthening Interpersonal Communication**

**Session Chair:** Annette Robinson, Magic Leap Horizons  
**Session Deputy:** Alysson Hursey, SAIC

**Communication Skills Development for Non-Commissioned Officers (NCOs) (19293)**  
Kara Orvis, Jessica Shenberger-Trujillo, Krista Raytwani, Aptima, Inc.; April Sanders, U.S. Army Research Institute, Fort Hood Unit

**LEGO Serious Play: A Powerful Sense-Making Tool in Military Contexts (19267)**  
Kevin Thorn, NuggetHead Studioz

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**Human Performance, Analysis and Engineering**

**H1** TUESDAY • 3 DECEMBER • 1400 • ROOM S320E

**There’s Reality and There’s Virtual Reality**

**Session Chair:** Scott Johnston, Booz Allen Hamilton  
**Session Deputy:** Sophia Moshasha, Brightline Interactive

**Optimizing Haptics within AR/VR Training Given Human Sensory Capabilities (19336)**  
Kelly Hale, Ph.D., Draper Laboratory; Claire Hughes, Christina Padron, Design Interactive, Inc.

**Simulations to Train Buried Explosives Detection: A Pilot Investigation (19134)**  
Dean Reed, Crystal Maraj, Jonathan Hurter, University of Central Florida Institute for Simulation and Training; Latika Eifert, CCDC – Soldier Center, Simulation and Training Technology Center

**Effects of Transparency Level, Controller Type and Visual Degradation on Performance Using Augmented Reality and Synthetic Vision (19272)**  
Alex Proaps, Sarah Leibner, Old Dominion University; James Bliss, Ph.D., Leidos, Inc.
H2 WEDNESDAY • 4 DECEMBER • 0830 • ROOM S320E

Don’t Forget Your Towel: The Hitchhiker’s Guide to Cognition

Session Chair: Gordon Gattie, NSWC Dahlgren
Session Deputy: Benjamin Goldberg, Ph.D., CCDC – Soldier Center, Simulation and Training Technology Center

Cognitive Expertise through Repetition Enhanced Simulation (CERES): Learning to Understand Topographic Maps (19258)
Kevin Schmidt, The Air Force Research Laboratory; Brooke Feinstein, Marcia Grabowcke, Ph.D., Paul J. Reber, Ph.D., Northwestern University

Cognitive Skill Assessment in a Virtual Environment (19323)
Allison Hancock, Ph.D., Jennifer Phillips, Cognitive Performance Group; Natalie Steinhauser, NA WCTSD; James Niehaus, Ph.D., Charles River Analytics

Real-Time Measurement of Team Cognitive Load during Simulation-based Training (19129)
Jeffrey Beaubien, Ph.D., Sterling Wiggins, William DePriest, Aptima, Inc.

H3 THURSDAY • 5 DECEMBER • 0830 • ROOM S320E

What Gets Measured, Gets Done

Session Chair: Perry McDowell, MOVES Institute, Naval Postgraduate School
Session Deputy: Jason Bewley, ATS

Situational Awareness Measuring Method in Simulated Combat – A Case Study (19153)
Uriel Huri, Yisachar Shapira, Yoav Yulis, IDF Ground Forces Command Battle Laboratory

Developing a Scaled Performance Evaluation Measurement System (19133)
Garrett Loeffelman, TECOM (RTPD); Quinn Kennedy, Ph.D., Naval Postgraduate School; Glenn Hodges, Ph.D., U.S. Army

Rethinking Effectiveness Evaluations: Measuring the Effectiveness of a Mobile Performance Support Application Using xAPI (19162)
Jennifer Murphy, Ph.D., Frank Hannigan, Tarah Daly, Quantum Improvements Consulting; Chad Udell, Float

H4 THURSDAY • 5 DECEMBER • 1030 • ROOM S320E

Human Performance Pot Pie

Session Chair: Aerial Kreiner, Ph.D., USAF AFRL
Session Deputy: Jennifer Wheeler, Southwest Research Institute

Psychomotor Skills Assessment via Human Experts, Simulators and Artificial Intelligence (19108)
Roger Smith, Ph.D., Danielle Julian, AdventHealth Nicholson Center

“CGHowTo” – “Help Right Now” for Coast Guardsmen in the Field (19203)
Timothy Quiram, LCDR Rachel Stutt, Ronald Stark, U.S. Coast Guard

Wearable Stress Monitoring During Live Training (19237)
James Pharmer, Ph.D., Richard Plumlee, NA WCTSD; Kelly Hale, Ph.D., Draper Laboratory; Zach Huber, Design Interactive

Policy, Standards, Management and Acquisition

P1 TUESDAY • 3 DECEMBER • 1400 • ROOM S320C

Collaboration: It Takes Two to Tango

Session Chair: Doug Parsons, CCDC Aviation & Missile Center
Session Deputy: Phil Brown, Ph.D., Joint Resources and Readiness Division, NORAD-USNORTHCOM J74

A Tale of Two T’s: Enabling Testing Through Reuse of Training Services (19356)
Thomas Kehr, CMSP, University of Central Florida; Robert Cox, U.S. Army PEO STRI; Scott Nix, General Dynamics Mission Systems

Raising the Standard – Industry and Government Working Together for Simulation Coherence (19187)
Simon Skinner, Thales UK Ltd.; Grant Bailey, UK Ministry of Defence

With Uncertainty Comes Opportunity: Solving the DoD’s Flash Problem (19305)
Trey Hayden, Yihua Liu, Advanced Distributed Learning (ADL) Initiative

P2 TUESDAY • 3 DECEMBER • 1600 • ROOM S320C

What’s Up in the Joint Integrated Training Environment

Session Chair: Steve Parris, Laerdal Medical & Simulations
Session Deputy: Shauna Stokes, PM TRASYS

Overview of USMC Modeling and Simulation Office Policy Lessons Learned (19132)
Eric Whittington, JHU/APL; Brett Telford, MCMSO (USMC)

Air Force Methodology for Overarching Joint Training Policy for Joint Interoperability (19262)
Lillian Campbell-Wynn, Ph.D., AFAMS

Live-Virtual-Constructive Training Environment Analysis of Alternatives Lessons Learned (19135)
Eric Whittington, William Brobst, JHU/APL; Byron Harder, Ph.D., TECOM (TECD)

P3 WEDNESDAY • 4 DECEMBER • 0830 • ROOM S320C

Measure Twice, Execute Once

Session Chair: Marty Bink, Ph.D., University of Georgia
Session Deputy: Mindy Hoover, Iowa State University

Ensuring Psychometric Validity Within an Automated Performance Measurement Standard (19170)
Mitchell Tindall, Ph.D., Beth Atkinson, NA WCTSD

Measuring the Impacts of Transitioned Solutions (19234)
Jesse Flint, Design Interactive, Inc.; Darren Wilson, Department of Homeland Security Science and Technology

When Time Matters, Assessment Only and the Risk Management Framework (19118)
Douglas Wedel, AFLCMC/WLZ; Demica Robinson, AFLCMC/ WNS
**P4**  
**WEDNESDAY • 4 DECEMBER • 1030 • ROOM S320C**  
**Big Data**

**Session Chair:** Mike Merritt, NA WCTSD  
**Session Deputy:** Aaron Presnall, Jefferson Institute

*Access Control in the Era of Big-Data Driven Models and Simulations (19115)*  
Anne Tall, Cliff Zou, Jun Wang, University of Central Florida

*Privacy Challenges in DoD Big Data Analytics (19210)*  
Mariusz Balaban, U.S. Army

*Cybersecurity Strategies for Accrediting Experience API (19308)*  
Miguel Hernandez, Michael Neeley, Andy Johnson, Advanced Distributed Learning (ADL) Initiative

**P5**  
**WEDNESDAY • 4 DECEMBER • 1400 • ROOM S320C**

**Emerging Approaches for Simulation in Acquisition**

**Session Chair:** James Dennis, General Dynamics Information Technology  
**Session Deputy:** Keith Henry, USAF AFAMS

*Using Design of Experiments to Improve Analyses, Simulations and Cost (19104)*  
Steven Gordon, Ph.D., Karen Dillard, Ph.D., GTRI

*A New Approach to Building Agile Simulations (19157)*  
Charles Sanders, Edge 360 LLC

*Model Based Systems Engineering for Acquiring Vehicle Training Simulations (19221)*  
Richard Cope, Devarshi Desai, Cattien Nguyen, Naomi Acosta, NA WCTSD

**P6**  
**WEDNESDAY • 4 DECEMBER • 1600 • ROOM S320C**

**Acquisition: Streamlining Standards and New Approaches**

**Session Chair:** Michelle Wright, Navy  
**Session Deputy:** Holley Hagerman, JTIEC

*Government - Industry Collaboration: Essential to Training Evolution and Relevancy (19347)*  
Michael Rambo, Textron Aviation Defense

*Application of the M&S Community of Interest Discovery Metadata Specification to Standards Profiles for Acquisition and Air Force Training (19270)*  
James Coolahan, Ph.D., Coolahan Associates, LLC; William Oates, AFAMS; Peggy Gravitz, Huntington Ingalls Industries Mission Driven Innovative Solutions; Kenneth Konwin, Booz Allen Hamilton

*Tailoring Acquisition to Deliver at the Speed of Commercial Industry (19315)*  
Graham Fleener, U.S. Army PEO STRI; Julio Villalaba, ECS Federal

**P7**  
**THURSDAY • 5 DECEMBER • 0830 • ROOM S320C**

**Novel Applications: Back to the Future**

**Session Chair:** Janet Weisenford, ICF  
**Session Deputy:** Rachael MacKenzie, USAF AFLCMC

*A Proposal Standard for Distributed Aerial Refueling with Probe-and-Drogue System (19127)*  
Michael Tillett, Hung Tran, CAE USA

*Medical Simulation for the Future of the Joint Training Community (19385)*  
M. Beth Pettit, STTC and David Thompson, JPC-1/MSISRIP, Army

*The Flying Car – Emergent Modeling & Simulation (M&S) Policies and Standards Concerns (19140)*  
Kevin Hulme, Ph.D., CMSP, Panagiotis Anastasopoulos, Stephen Still, Sarvani Pantangi, Ugur Eker, Sheikh Ahmed, University at Buffalo; Grigorios Fountas, Edinburgh Napier University

**P8**  
**THURSDAY • 5 DECEMBER • 1030 • ROOM S320C**

**Concepts In Agility and Risk**

**Session Chair:** Jeremiah Folsom-Kovarik, Soar Technology  
**Session Deputy:** Sharon Tabori, Collins Aerospace

*Executive Risk Assessments for the Age of Algorithms (19110)*  
Randal Allen, Ph.D., CMSP, Steven Roemerman, Eric Haney, Ph.D., Lone Star Analysis

*Air Force Agile Development Methodology for Addressing Future Air Operations Capabilities (19268)*  
Lillian Campbell-Wynn, Ph.D., AFAMS

*Requirements Engineering Innovations for Agile-based Programs (19247)*  
Paul Butler, Bill Fetech, Devin Hobby, Amy Lim, MITRE Corporation; Cynthia Harrison, Barbara Pemberton, U.S. Army PEO STRI

**Simulation**

**S1**  
**TUESDAY • 3 DECEMBER • 1400 • ROOM S320B**

**Simulation Architectures**

**Session Chair:** Peter Swan, VT MAK  
**Session Deputy:** Brian Vogt, SAIC

*Assessing and Measuring Interoperability Between Multi-national Live Training Systems (19186)*  
James Benslay Jr., Greg Carrier, MITRE Corporation; LTC Rhea Pritchett, U.S. Army PEO STRI; W. Bogler, Combat Capabilities Development Center

*Towards a Common Reference Architecture for Mission Training Through Distributed Simulation (19225)*  
Tom van den Berg, Wim Huiskamp, TNO Defence Research

*New Techniques for High-Fidelity Modeling and Simulation in 5G Mobile Network Environments (19322)*  
Steven Kropac, LGS Innovations, LLC; Jeff Weaver, SCALABLE Network Technologies

**S2**  
**TUESDAY • 3 DECEMBER • 1600 • ROOM S320B**

**Synthetic Terrain Environments**

**Session Chair:** Nina Deibler, Serco, Inc.  
**Session Deputy:** Mike Lokuta, CAE

*Enhancing Situational Awareness Anywhere in the World with Geospatially Accurate Scene Simulation Using Automated “Real World” Content Generation (19112)*  
Brian Miles, OSC; Thomas Creel; Kathy Wilder; Arthur Kenton; Mark Abrams, EGS

*Reconfiguring Synthetic Environments as Inputs to Unity 3D (19277)*  
Abhishek Verma, Triston Thorpe, Collins Aerospace

*Geospecific 3D Terrain Data Optimization Solutions for Game and Simulation Engines (19368)*  
Lathin Liles, Jorge Ortiz, Chris Caruthers, GameSim
PAPERS

S3   WEDNESDAY • 4 DECEMBER • 0830 • ROOM S320B
Autonomy in Simulation
Session Chair: Michael Natali, CNATRA
Session Deputy: Edward Degnan, Ph.D., USAF AFAMS
Controling Computer-Generated Lifeforms Using Fuzzy State Machine (19126)
Hung Tran, Nguyen Tran, CAE USA
Simulation and Sensitivity Analysis of Mobile Proximity Stopping Distance in Unity (19152)
William Helfrich, Jennica Bellanca, Brendan Macdonald, Jacob Carr, Timothy Orr, CDC/NIOSH
Simulation-Based Autonomous Systems Testing – from Automotive to Defense (19166)  
Timothy Coley, Dave Fulker, XPI Simulation; Rob McConachie, Thales

S4   WEDNESDAY • 4 DECEMBER • 1030 • ROOM S320B
Adapting the Simulation Toolbox
Session Chair: Angela Alban, SIMETRI, Inc
Session Deputy: Capt Kathleen Haggard, PM TRASYS M&S Officer
Lessons Learned in the Experimental Use of Simulated Malodors to Support Live Training (19107)
William Pike, Ph.D., US Army CCDC-SC STTC; Michael Proctor, CMSP, University of Central Florida; Deborah Burgess, The SALUD Group, Inc.
Adapting Existing Simulation Architectures to Enhance Tailored Instruction (19239)
Robert Sottolare, Alyssa Tanaka, Ross Hoehn, Soar Technology
Tactical Decision Kits for Infantry Training (19341)
Christopher Young, Lockheed Martin Rotary and Mission Systems; Richard Schaffer, Michael Longtin, Lockheed Martin; Brian Stensrud, Soar Technology; Marcus Mainz, United States Marine Corps

S5   WEDNESDAY • 4 DECEMBER • 1400 • ROOM S320B
Engineering Simulation Solutions
Session Chair: Christina Bouwens, Ph.D., University of Central Florida
Session Deputy: Klainie Nedoroscik, American Systems
Aimpoint Solutions on Complex Area Targets (19172)
Matthew McLaughlin, Fires Battle Lab
Cyber Model-based Engineering (MBE) (19254)
Ambrose Kam, Matthew Curreri, Lockheed Martin; Carl Hein, Michael Stebnisky, XSIM
Enhancing Wargaming Fidelity with Network Digital Twins (19269)
Jeff Hoyle, Dr. Rajive Bagrodia, Ha Duong, Jeff Weaver, Ung-Hee Lee, SCALABLE Network Technologies

S6   WEDNESDAY • 4 DECEMBER • 1600 • ROOM S320B
Improving Computer Generated Forces
Session Chair: Jimmy Moore, CMSP, PeopleTec
Session Deputy: Paul Andrzejewski, HigherEchelon
Demonstrating the Effects of Human Behavior in Simulation Using the RAND Will to Fight Model (19111)
Glenn Hodges, Ph.D., U.S. Army; Alfred Connable, Ph.D., Aaron Frank, Ph.D., Henry Hargrove, RAND
Reusability and Efficiency in Behaviour Modelling for Computer Generated Forces (19211)  
Joost van Oijen, Armon Toubman, Gerald Poppinga, Netherlands Aerospace Centre NLR
Exploring Game Industry Technological Solutions to Simulate Large-scale Autonomous Entities within a Virtual Battlespace (19328)  
Raymond New, Kyle McCullough, Noah Nam, Ryan McAlinden, University of Southern California Institute for Creative Technologies

S7   THURSDAY • 5 DECEMBER • 0830 • ROOM S320B
Advancing Virtual Reality and Training
Session Chair: Kenny Hebert, Quantum3D
Session Deputy: Monique Brisson, USAF AFRL
Designing Virtual Reality Tools: Making Simulated Interventions Feel and Act Like Their Real Counterparts (19190)  
Megan Smith, University of Regina; John Desnoyers-Stewart, Simon Fraser University; Gregory Kratzig, Royal Canadian Mounted Police
Toolset 3D Position Tracking For A Visio-Haptic Mixed Reality System (19279)  
Mehmet Aygun, Mehmet Nacar, Mehmet Guler, Eren Celk, Hulusi Baysal, Hacı Yuksel, Havelsan; Yigit Tascioglu, Tobb University of Economics & Technology
Utilizing Commodity Virtual Reality Devices for Multi-user Training Simulations (19361)
Jack Miller, Austin Hanus, Eliot Winer, Ph.D., Iowa State University

S8   THURSDAY • 5 DECEMBER • 1030 • ROOM S320B
Wargaming and Planning
Session Chair: John Huddleston, Ph.D., Coventry University
Session Deputy: Todd Glenn, FAAC Incorporated
Wargaming Evolved: Methodology and Best Practices for Simulation-Supported Wargaming (19182)  
Per-Idar Evensen, Dan Helge Bentsen, Marius Halsor, Norwegian Defence Research Establishment (FFI); Svein Erlend Martinussen, Norwegian Defence University College (NDUC)
Supporting Military Planning with Simulation (19212)  
Rikke Amilde Seehuus, Jo Hannay, Ørjan Rise, Norwegian Defence Research Establishment (FFI); Roar Wold, Philip Matlary, Norwegian Defence University College (NDUC)
Using LVC Technology for the Military Planning Process (19290)
Perry McDowell, MOVES Institute, Naval Postgraduate School; Ryan Lee, Naval Postgraduate School
Radio Frequencies
Session Chair: Nina Deibler, Serco, Inc.
Session Deputy: Eric Jarabak, PM TRASYS ENG

Jamming Techniques 2.0 (19224)
David Haber, Collins Aerospace; Patrick Merlet, Parsons Corporation; Charles Brooks, SRC Inc.

Radio Network Automation for Operational Testing: A Practical Resource for Radio Networks Planning (19366)
Carlos Leon-Barth, Patricia Wright, Athena-Tek; Thomas Mitro, AIT Engineering; Robert Cox, U.S. Army PEO STRI; Scott Nix, General Dynamics Mission Systems; Robert Carpenter, General Dynamics

Training
T1 TUESDAY • 3 DECEMBER • 1400 • ROOM S320F
Enhanced Add-ons: Stories and Games
Session Chair: Robert Wallace, USAF ACC 29TSS
Session Deputy: Chuck Wythe, Cape Henry Associates

Game-based Learning to Enhance Post-secondary Engineering Training Effectiveness (19139)
Kevin Hulme, Ph.D., CMSP, Aaron Estes, Mark Schiferle, Rachel Su Ann Lim, University at Buffalo

Revolutionizing Formal School Learning with Adaptive Training (19215)
Amanda Bond, Brian Stensrud, Soar Technology; Natalie Steinhauser, NAWCTSD; Jennifer Phillips, Cognitive Performance Group

Game On: Storytelling Narrative Applied to Simulator-based Training (19363)
Margaret Merkle, Tara Browne, Ph.D., USAF

T2 WEDNESDAY • 4 DECEMBER • 1030 • ROOM S320F
Tag You’re It: Team Training & Oversight
Session Chair: Sean Carey, USAF HQ AMC
Session Deputy: Maureen Holbert, Booz Allen Hamilton

Enhancing Training of Supervisory Control Skills for Automated Systems (19120)
Natalie Drzymala, Natim Research; Thomas Graves, Army Research Institute; Tim Buehner, Natim Research; Steven Aude, ICF

The Development and Implementation of Speech Understanding for Medical Handoff Training (19235)
Alyssa Tanaka, Ph.D., Brian Stensrud, Ph.D., Soar Technology; Gregory Welch, Ph.D., Francisco Guido-Sanz, R.N., Ph.D., University of Central Florida; LCDR Lee Sciarini, Ph.D., Naval Survival Training Institute; CDR Henry Phillips, Ph.D., NAWCTSD

Training Teamwork Skills in an Intelligent Tutoring System (19276)
Robert McCormack, Ph.D., Tara Kilcullen, Alexander Wade, Tara Brown, Ph.D., Alexander Case, Dan Howard, Aptima, Inc.; Anne Sinatra, U.S. Army Combat Capabilities Development Command Soldier Center SFC Paul Ray Smith Simulation & Training Technology Center

T3 WEDNESDAY • 4 DECEMBER • 1400 • ROOM S320F
Training, Accelerated
Session Chair: Nick Giannias, CAE
Session Deputy: Stu Armstrong, Cole Engineering Services, Inc.

Simple to Complex – Evolution of Workforce Training in a Rapidly Changing Environment (19155)
Mike Thorpe, Serco, Inc.

Improving Assessments Using Intelligent Agents with Transient Emotional States (19251)
Angie Dowdell, Army Research Institute, Columbus State University; Rania Hodhod, Columbus State University; Suleyman Pölat, University of North Texas; Randy Brou, Army Research Institute; Julia Grove, Consortium Research Fellows Program

Learning Next: Self-Improving Competency-based Training Rooted in Analytics (19302)
Jennifer Lewis, CMSP, Kathryn Thompson, Tobie Smith, SAIC

T4 THURSDAY • 5 DECEMBER • 1030 • ROOM S320F
Improving Training through Realistic Environments and Architectures
Session Chair: Thomas Yanoschik, CMSP, SAIC
Session Deputy: Capt J. Garrick Sheatley, EWTGLANT M&S Officer

Impact of Malodors on Tourniquet Application: A Longitudinal Study (19169)
Christine Allen, Ph.D., CMSP, Claudia Hernandez, Sasha Willis, Brian Goldiez, Ph.D., Grace Teo, Ph.D., Lauren Reiner-Jones, Ph.D., University of Central Florida Institute for Simulation and Training; Mark Mazzeo, U.S. Army Combat Capabilities Development Command; William Pike, Ph.D., U.S. Army CCDC-SC STTC

Driving Digitally-Aided Close Air Support Capabilities in Simulation: Lessons Learned (19320)
Emilie Reitz, Joint Staff, J6; Kevin Seavey, Alion S&T

Adaptive Network Planning for Infrastructure Networks for Test and Training Events (19337)
Rajive Bagrodia, Ph.D., Jeff Weaver, Wei Liu, Defeng Xu, SCALABLE Network Technologies; Gil Torres, Kent Pickett, TRMC S&T C4T; Jason Richardson, David McClung, U.S. Army Operational Test Command
Continuing Education Units: An I/ITSEC Opportunity

Continuing Education Units (CEU) were established in 1970 to create a unit of measurement to quantify continuing education and training activities. CEUs apply to technical and educational settings such as I/ITSEC. The primary focus of I/ITSEC is to highlight innovative implementation of simulation and education technologies as tools to achieve cost efficient training and increased military readiness. Therefore, CEUs are offered for all Tutorials, Paper Sessions, and the Professional Development Workshops. CEUs are being sponsored and maintained by the University of Central Florida, Division of Continuing Education.

WHY SHOULD I EARN CEUs AT I/ITSEC?

- Participation in the tutorials, papers and Professional Development Workshops for CEU credit reinforces your commitment to remain current in the evolving technologies relating to training and simulation.
- The CEU transcript indicates your active participation in the technical program of the conference to your employer.
- Previous attendees have indicated that CEUs have assisted them in securing approval to attend the conference.

WHAT SESSIONS ARE CEU-ELIGIBLE?

- All Tutorials, Papers, and Professional Development Workshops are CEU-eligible.

WHO MAY ATTEND THESE EVENTS?

- Tutorials and Professional Development Workshops are open to everyone. The Paper Sessions are limited to registered conference attendees.
- Does attending mean I automatically receive CEU credits? No. You have to let us know, via your registration, that you are interested in the credits. There is no charge for Paid Conference Attendees. However, if you are in an unpaid category (i.e., Exhibitor Personnel) there is a $45 charge, payable during registration. You may also register separately for the CEUs if you missed this step in your conference registration process.

HOW DO I RECEIVE CEUs AT I/ITSEC?

1. Be sure you are appropriately registered (you can confirm when you check in on site) for CEU credits.
2. Be sure to have your conference badge scanned by a conference volunteer at each session you attend. Attendance is recorded electronically and required for CEU credit.
3. Your CEU transcript will come to you via the University of Central Florida, Division of Continuing Education. Ten contact hours equal to one CEU credit.

Contact Jana Brevardova at jana.brevardova@ucf.edu or 407-882-0247 for additional information.

Continuous Learning Points (CLPs)

The U.S. Department of Defense (DoD) acquisition workforce members are expected to earn Continuous Learning Points (CLPs) to stay current in leadership and functional acquisition skills that augment the minimum education, training, and experience standards established for certification purposes within their acquisition career fields. It is each acquisition member’s responsibility to meet the goal of 40 CLPs each year and to meet the mandatory requirement of 80 CLPs every two years. Acquisition Professional Activities are allowed to count toward CLPs. CLPs are awarded in accordance with DoD-wide guidelines as augmented by Service-specific policies. I/ITSEC provides an excellent opportunity for the DoD acquisition workforce members to earn mandatory CLPs.

Certified Modeling and Simulation Professional

EVENTS AT I/ITSEC

STATE OF THE CMSP NATION MEETING

Wednesday, December 4, 1000 – 1100, Room S210D
Join the CMSP discussion with a newly formed CMSP 3.0 review committee.

CMSP WORKSHOP

Friday, December 6, 0800 – 1200, Room S331A
This workshop describes the CMSP application, philosophy behind the exam and delves into sample exam questions.

CMSP CERTIFICATION

Requirements: 3-8 years work experience, CMSP application, resume, 3 letters of recommendation, and successful completion of the CMSP exam. Certification is good for 4 years after which recertification is required.

For more information, visit SimProfessional.org or contact Carol Dwyer at cdwyer@NDIA.org
Friday — Professional Development Workshops

Location: Orange County Convention Center, South Concourse, Rooms S330 A-D and S331 A-D

Date: Friday, 6 December

Times: 0700 Limited Continental Breakfast and Registration
AM Sessions 0800 – 1200 • FULL DAY Session 0800 – 1630 • PM Session 1300 – 1600

Who may attend? All registrants of I/ITSEC are welcome to attend.

Fees: There is no fee for I/ITSEC Conference Registrants/Exhibitors – I/ITSEC badge required for entry.

CEU/CLP: Paid I/ITSEC Conference registrants are eligible to receive CEU/CLP credits. If not a paid attendee, a $45 fee will be charged only if you wish to receive the CEU credits.

Registration: Registration for individual workshops is not required. Workshops fill on a first-come, first-serve basis. Please arrive early for topics that interest you the most — seating is limited. If you wish to receive CEU credits, be sure to request CEUs during your conference registration. You may update your registration to include CEUs at any time at http://www.iitsec.org/attend/registration-fees

Lunch: On own

Coordinated by University of Central Florida Division of Continuing Education.
For more information about available programs and services, please visit us at www.ce.ucf.edu

ALL PROFESSIONAL DEVELOPMENT WORKSHOPS ARE ELIGIBLE FOR CEU/CLP CREDITS (SEE PAGE 70)

PDW1 • Room S330EF • 0800 – 1630

CyberTRAINsitions

Presenters: David Metcalf, Ph.D., Director, Mixed Emerging Technology Lab, David “Fuzzy” Wells, Ph.D., CMSP, Deputy Director, Lauren Reinerman-Jones, Ph.D., Director of Prodigy Lab, Matthew Canham, Ph.D., Research Assistant Professor, Cyber Security, Institute for Simulation and Training, University of Central Florida

The accelerating pace of technological innovation and development is outpacing both employees’ and employers’ ability to maintain the minimum requisite knowledge, skills and abilities (KSAs) to operate effectively. Future cyber workforce development and the continuous training of existing employees will require new and innovative methods for the creation of vehicles for recruitment and engagement of the broadest possible impact. The CyberTRAINsitions workshop, will bring together representatives from the Department of Defense, academia and private industry to discuss these challenges and consider potential solutions. Building from the TRAINsitions workshop hosted by the Institute of Simulation and Training in January 2019, CyberTRAINsitions will feature a keynote presentation by VADM Nancy Norton, a lunchtime student cyber-project poster session, three breakout special-topic focus tracks covering Cyber Strategy and Policy (Room S330B), Human Aspects of Cybersecurity (HACS) (Room S330C) and Integrating Women & Underrepresented Communities into the Cyber Workforce (Room S330D).

Workshop Schedule:

0800 – 0845 Plenary Session
0845 – 0900 Networking Break
0900 – 1130 Break-out Sessions

Cyber Strategy and Policy
Human Aspects of Cybersecurity (HACS)
Integrating Women & Underrepresented Communities into the Cyber Workforce

1130 – 1300 Lunch, Student Posters, and Demos
1300 – 1530 Break-out Sessions

Cyber Strategy and Policy
Human Aspects of Cybersecurity (HACS)
Integrating Women & Underrepresented Communities into the Cyber Workforce

1530 – 1545 Networking Break
1545 – 1630 Closing Remarks and Discussion
Certified Modeling & Simulation Professional (CMSP)

**Presenter** Ivar Oswalt, Ph.D., CMSP, NET+, Senior M&S Analyst, The MIL Corporation

This workshop describes the CMSP program, with an emphasis on characterizing the requirements for achieving this valuable certification. It describes the application and examination processes (e.g., education and work experience, application, and reference requirements; how the exam is administered; and the role of continuing education). In addition, it summarizes the philosophy behind the examination approach employed, describes the two examination tracks offered (Technical and User/Manager), and delves into some detail regarding sample exam questions. This workshop is being taught by a recent CMSP recipient, and thus includes timely insights into preparing for and achieving this certification. Finally, after providing an overview of the exam and summarizing strategies for self-study, this workshop concludes with a round-table discussion regarding evolving this certification for future success.

THE DISTINCTION OF A COMMITTED M&S PROFESSIONAL

EARNING YOUR CMSP DESIGNATION DELIVERS:

- **RECOGNITION** as a leader in the M&S Profession
- **VALIDATION** of your skills, knowledge, and abilities
- **MEMBERSHIP** in a vibrant community, with associated professional opportunities

Harnessing the Power of Data Analytics to Optimize Training

**Presenters** Liz Gehr, Ph.D., Chief Learning Scientist, The Boeing Company; Barb Buck, Ph.D., Research Psychologist, The Boeing Company

Data analytics offers a principled approach to managing data and making it a valuable resource for understanding complex interactions and improving operations. The training community has unique needs and obstacles when attempting to implement a standard data analytics approach. New technology and emerging standards such as xAPI enable the collection of data from a variety of training sources, including student records, training devices, student performance during training and student daily activities. The collection, preparation, integration and understanding of this wealth of data present many obstacles as well as opportunities. This workshop will provide an overview of common and emerging data analytics methods as they relate to training data, as well as how they can be applied to enable and support competency-based learning and adaptive learning. One main focus will be the challenges associated with applying standard data analytics methods in a military training environment. Other topics covered will include how to prepare, transform and store data for analysis, opportunities in data visualization and privacy issues. The format of the workshop will involve lecture and interactive question-and-answer sessions for each topic addressed. Participants are encouraged to bring up additional topics or examples of training data analytics applications.

Live-Virtual-Constructive (LVC) Interoperability Techniques

**Presenters** Ed Powell, Ph.D., Principal at Edward Powell Consulting; Randy Saunders, The Johns Hopkins University Applied Physics Lab

This workshop will provide an overview of the systems engineering issues with regard to integrating disparate military simulations for analysis, training, testing and other purposes. We will discuss the three major interoperability techniques, the Distributed Interactive Simulation (DIS) standards, the High Level Architecture (HLA) for Modeling and Simulation and the Test and Training Enabling Architecture (TENA), including descriptions of their architectures and some of their use cases. Recent and planned evolution of each architecture will be explained. A discussion of how these architectures are actually used in the real world and the process for integrating disparate systems in a multi-architecture environment will be discussed. The format of the workshop will be part lecture and part informal discussion/question answer. Participants are encouraged to raise specific topics any time during the workshop.

Serious Game Design Workshop

**Presenters** Peter Smith, Ph.D., Assistant Professor, University of Central Florida; Kishan Shetty, Producer, Janus Research

During this accelerated half-day workshop, participants will be introduced to key concepts, steps and processes involved in designing a serious game for learning. Through hands-on activities and working together in groups, participants will design a learning game. Participants will experience each phase of the design process, including identifying the training requirements and learning objectives, creating an effective story, determining instructional and gaming strategies and designing key game and instructional mechanics. Central to our approach will be ensuring that that any key design decision addresses both gaming and instructional considerations. During the workshop, participants will be introduced to key methods to use and issues to consider when designing a learning game. Groups will share their design decisions along the way.
Team and Collective Training Needs Analysis (TCTNA)

Presenter: John Huddlestone, Ph.D., Senior Research Fellow in the Human Systems Integration Group, Institute for Transport and Future Cities, Coventry University, England

Effective team training is a significant precursor to the delivery of team performance at the level required for organizational success in the military context (and elsewhere). The front end analysis techniques required to identify team training requirements, specify training solutions and evaluate training options must address complexities of team task, environment and delivery methods. Team and Collective Training Needs Analysis (TCTNA) is a methodology that has been developed for the UK MOD specifically to address this front end analysis challenge. The TCTNA method is built upon a set of simple models which facilitate structured thinking about team and collective training problems. The purpose of this workshop is to provide an understanding of how analysis and design concepts familiar from Instructional Systems Design / the Systems Approach to Training have been extended within TCTNA to address the complexities of team and collective training. The focus of the workshop will be on the application of the underpinning models to guide structured thought to deliver effective analysis, rather than rigid procedural detail. Its application will be demonstrated by means of a Maritime Force Protection case study and further illustrated by examples form the underpinning research. The workshop will reflect the latest enhancements to the methodology developed in 2018/19. The iterative application of TCTNA to support key stages in the acquisition process will also be discussed. The workshop will include short elements of presentation, group discussions and break out activities to explore the application of the principles of the method.

Using ROI-Focused Design Thinking to Deliver Impact Results

Presenter: Timothy R. Brock, Ph.D., CPT, CRP, ID (S&L+), Director of Consulting Services, ROI Institute

Training and education programs that use simulation as a learning medium offer significant value to improve military preparedness and mission outcomes. Yet, it is now necessary to add bottom line and ROI funding justifications to support three government mandates to (1) decrease costs, (2) increase value through improved efficiencies and outcomes and (3) expand sustainable capabilities to compensate for continuing funding decreases. This workshop introduces the ROI Methodology that applies design thinking principles to demonstrate the value of using simulation in training and education programs in terms that government, military and corporate executives understand and desire to make initial and ongoing funding decisions.
STEM
STEM supports and promotes activities encouraging students’ interest and pursuit in Science, Technology, Engineering and Mathematics.

**STEM Today = Prepared Workforce for Tomorrow**

In support of STEM and Workforce Development, I/ITSEC sponsors the following programs:

- Future Leaders Pavilion
- Students at I/ITSEC
- Florida High Tech Corridor Council’s stemCONNECT
- Undergraduate Scholarship
- Postgraduate Scholarships (Doctoral/Masters)
- Serious Games Showcase & Challenge
- I/ITSEC Professional Development Workshops
- Central Florida Educators Workshop
- Continuing Education Units
- America’s Teachers at I/ITSEC
- UCF/FIEA Games in Simulation Panel
- Golf and 5K Fundraiser

Visit the STEM Pavilion at Booths 2880-3197
Learning and Leadership are indispensable to each other.

The National Training and Simulation Association and the members of I/ITSEC take great pleasure in welcoming you to the Thirteenth Annual Future Leaders Pavilion and Special Session.

We are delighted to host secondary students from such diverse areas as:
- New Orleans, LA
- Dallas, TX
- Orlando, FL
- Latham, NY
- Philadelphia, PA

The students who participate in the Future Leaders Pavilion (FLP) are committed to excellence and are enrolled in engineering, computer sciences, mathematics, or modeling and simulation tracks. Projects presented this year will continue the legacy of excellence built by previous FLP participants.

Please remember to stop by FLP, located in Booth 2980, during your visits to the exhibit floor.

On Wednesday at 1600 in Room S320F, please lend support to our Future Leaders as they present their projects during their Special Session – “The Future is Now!”

Join us again at 1415 at the Innovation Showcase, Booth 2588 for an award ceremony acknowledging the work of our Future Leaders. FLP sponsored by: IAI, SAIC, Trideum Corporation, and Wittenstein

Students at I/ITSEC
Thursday, 5 December • 0900 – 1400

Over the years, thousands of Central Florida high school students have participated in a unique learning experience by visiting the Exhibitors/Exhibits. The purpose of the I/ITSEC Student Tours is to allow students to experience firsthand, real-world training, simulation and education solutions that will help bridge the gap between classroom theory and the applied use of Science, Technology, Engineering and Mathematics (STEM) subjects. Annually, over 600 students, along with 200 school chaperones and volunteer I/ITSEC member escorts, are exposed to special demonstrations and static displays of the training, simulation and education industry. Students are able to learn about the basic building blocks required to deliver high fidelity modeling and simulation products across a broad range of training environments. Participating in the I/ITSEC Student Tours on Thursday, 5 December 2019, will give students a complete understanding of how they can apply the STEM related skills they learn in the classroom to highly successful careers in our industry. For the first time in 2016, through a partnership with NTSA, the Florida High Tech Corridor Council and other “STEM-U-Lators,” we are making it possible to bring I/ITSEC to the classroom through the stem-CONNECT program. This virtual tour is broadcast live and recorded for use in the classroom at a later time.

To learn more about the I/ITSEC Conference and Student Tours, please contact Bill “Roto” Reuter, I/ITSEC Student Tours Coordinator, at roto@r-squaredsolutions.net or renita.ketchen@technologytap.com.
America’s Teachers @ I/ITSEC

I/ITSEC has a long history of supporting the education of students and teachers through visits to the conference. Since the America’s Teachers at I/ITSEC program began in 2008, we have hosted teachers from Arizona, California, Florida, Georgia, Maryland, Montana, New York, Ohio, Rhode Island, Tennessee, Texas and Virginia. As part of I/ITSEC’s efforts to further education in Science, Technology, Engineering and Mathematics (STEM), teachers and administrators from across the country have been invited to attend the conference. The America’s Teachers at I/ITSEC Program consists of an orientation session, attendance at the Modeling and Simulation stemCONNECT, guided tours of the Exhibit Hall and attendance at tutorials, paper sessions and special events. The teachers will be in sessions and visiting the Exhibit Floor on Monday through Wednesday. Please watch for their red, white and blue ribbons and be ready to engage in conversations about STEM and future workforce initiatives. This program is supported by the National Training and Simulation Association and its industry members.

Educators

Workshop to Introduce Simulation into the Physics Classroom

stemCONNECT

A program of the Florida High Tech Corridor

The Florida High Tech Corridor (The Corridor) is proud to partner with I/ITSEC once again to highlight the 23-county Corridor region’s thriving Modeling, Simulation and Training (MS&T) sector.

The evolution of technology has enabled Corridor programs to transform in ways unimaginable more than 20 years ago, specifically stemCONNECT. This program truly does make the connection between academia and private industry by bringing together students and teachers in classrooms with experts in science, technology, engineering and math (STEM) for engaging presentations through video conferencing tools. Indeed, since the first virtual session in 2013, stemCONNECT has already introduced high-tech careers in MS&T and other sectors to nearly 13,000 students and teachers.

The Corridor’s stemCONNECT team is excited to host two programs during I/ITSEC – one for educators and one for students – to showcase MS&T technology and related career opportunities. Educators will join stemCONNECT for guided tours of industry exhibits and presentations from well-known experts in the field, including representatives from the Institute for Simulation and Training at the University of Central Florida, the National Center for Simulation and the Florida Advanced Technological Education Center (FLATE) – an initiative of the University of South Florida, Hillsborough Community College and St. Petersburg College funded by the National Science Foundation. Students will learn about the role of robotics in MS&T by programming a LEGO™ robot and interacting with an NAO™ robot. stemCONNECT will also guide students on a tour of industry exhibits with robotics demonstrations.

For those who cannot attend, stemCONNECT will be live-streaming a tour of the I/ITSEC convention floor.
Great excitement awaits you in Booth #2880 at the 14th annual Serious Games Showcase & Challenge (SGS&C)!

The SGS&C provides a showcase of best-in-class learning games submitted by business, government, and student developers and awards noteworthy games to recognize their achievements. The true uniqueness of the SGS&C is that every I/ITSEC attendee has the chance to play the games, talk with the developers, and cast a vote for the coveted SGS&C People’s Choice Award.

The SGS&C brings international award-winning games to you through partnership with Simulation Australasia host of the Australasian Simulation Congress (ASC) SGS&C. These international winners automatically earn spots as finalists in the SGS&C, are eligible for awards, and are featured at I/ITSEC on the exhibit floor.

This year will once again highlight games that employ characteristics or techniques that enhance the game in a new or different way through the competition for the Innovation Award. The innovative technique can be hardware integration, instructional design, game design, content topic, or a combination thereof. Drop by the booth to see these innovative technologies in action!

The seven categories of SGS&C winners are announced at the Awards Ceremony on Thursday, December 5th at 1300 in the Innovation Showcase, Booth 2588: Best Business-Developed Serious Game; Best Government-Developed Serious Game; Best Student-Developed Serious Game; Best XR Serious Game; Innovation Award; Students’ Choice Award; and finally, what some might consider the most prestigious award, the People’s Choice Award. And remember, the People’s Choice Award is based on votes from you! Your I/ITSEC badge includes a special SGS&C ballot that allows you to vote for the winner. Be sure to vote before the deadline on Wednesday, December 4th!

Check out the Serious Games Showcase & Challenge to experience how games can address your serious learning needs.

For more information, contact Jenn McNamara: jmcnamara@breakawayltd.com
STEM Pavilion

Keeping the workforce pipeline filled with students pursuing STEM degrees is vital to the modeling, simulation, and training (MS&T) industry. It takes all of us to accomplish that. Each year the STEM Pavilion showcases organizations and programs that are successfully inspiring students and are preparing educators to teach and motivate them to pursue STEM degrees. We invite you to visit the Pavilion to learn more about the organizations and agencies active in the local community and across the country that you can support as a business or parent or community leader. Learn about programs available for students and how you can engage, mentor and help prepare them for future careers. Engage with educators who want to learn from you about the MS&T industry. Find ways to volunteer. Get involved! Your experience is needed.

Teacher Workshop

The annual I/ITSEC Teacher Workshop gives teachers a chance to be students and engages teachers in hands-on learning by letting them try new ideas for their classroom. It facilitates dialogue between project-based learning (PBL) and industry professionals, while providing a set of relevant and accessible resources for teachers to use throughout the year. Teachers representing counties throughout Florida participate. This year the educators will be on the exhibit floor with tour guides visiting key local MS&T exhibitors to learn about the industry, STEM skills needed and career opportunities available. If you see one of our teacher tour groups on Wednesday, stop and introduce yourself!

Visit www.centralfloridaSTEM.org/parents for more Parent resources
Visit www.centralfloridaSTEM.org/student for more Student resources
Visit www.centralfloridaSTEM.org/educators for more Educator resources

The State of America’s Workforce

27% of the new high-skills jobs related to agriculture that will be created in the next five years will require a STEM education.†
86% of engineers and 74 percent of computer professionals are men.†
14% of the engineering workforce is made up of women.†
21% STEM employers earn 21% more than individuals in non-STEM fields.†
10% Underrepresented minorities hold only 10% of science and engineering jobs despite making up over a quarter of the U.S. population age 21 and older.†

The Central Florida STEM Education Council mission is to collaboratively coordinate and plan STEM education efforts preparing and encouraging pre-college students to enter technical fields of study and to pursue employment in the Central Florida high-tech workforce.

Building a Brighter Future TODAY!
29th Annual RADM Fred Lewis Postgraduate Scholarship Recipients

In honor of RADM Fred Lewis, the former President of NTSA, these scholarships are offered to stimulate student interest and university participation in preparing individuals for leadership in the Modeling & Simulation, Training and Education communities. By investing in our future workforce, the scholarships encourage expansion of the I/ITSEC community and promote innovation through direct investment in our community’s future leaders. The awards are offered at a Masters level in the amount $5,000, and at a Doctoral level in the amount $10,000.

New Program

Inaugural Barbara McDaniel Undergraduate Scholarship

NTSA has established the inaugural Barbara McDaniel Undergraduate Scholarship program this year to acknowledge the substantial contributions of a long-time I/ITSEC leader. Mrs. McDaniel, the recipient of the I/ITSEC 2017 Lifetime Achievement Award, tirelessly supported all aspects of I/ITSEC since 1993. She began her career as an educator, so these awards will honor her life-long passion in the education of our youth. NTSA understands the importance of students pursuing Modeling & Simulation degrees and how vital it is to the modeling, simulation, and training (MS&T) industry. These new scholarship awards will keep the MS&T workforce pipeline filled, now starting at the Undergraduate level.

In its inaugural year, NTSA awarded $10,000 to each of three universities:
- Full Sail University in Orlando, FL
- Wright State University in Dayton, OH
- Auburn University in Auburn, AL

Leonard P. Gollobin Graduate Scholarship program was generously bequeathed by Mr. Gollobin to direct students developing their technical talents into the defense industry. Throughout his career, Mr. Gollobin led scientific initiatives that improved our defense systems and strategically shaped our military capabilities. NTSA administers this scholarship with the intent to provide financial support for those seeking advanced degrees and a path to leverage their commitment to strengthen our nation’s security.

3rd Annual Leonard P. Gollobin Post-Graduate Scholarship Recipients

Leonard P. Gollobin Graduate Scholarship program was generously bequeathed by Mr. Gollobin to direct students developing their technical talents into the defense industry. Throughout his career, Mr. Gollobin led scientific initiatives that improved our defense systems and strategically shaped our military capabilities. NTSA administers this scholarship with the intent to provide financial support for those seeking advanced degrees and a path to leverage their commitment to strengthen our nation’s security.

Important Dates for 2020

When to Apply: Applications must be post-marked by 26 June 2020. (Don’t Delay!)

How to Apply: See http://www.iitsec.org/education/students-and-teachers/scholarships for complete application details.

Award Announcement: 7 August 2020

Post Graduate Scholarships

Looking for Future Leaders in the Simulation, Training and Education Community. Learn more about the I/ITSEC community at www.iitsec.org.

Eligibility: U.S. Citizens • Full-time Masters or Doctoral students (complete undergraduate work by Spring 2020).

Sara Beadle
Clemson University
Human Factors Psychology

Adam Kohl
Iowa State University,
Mechanical Engineering & HCI

Emily Rikel
Embry-Riddle University
Human Factors

Alexandra Kaplan
University of Central Florida
Human Factors & Cognitive Psychology

Lee Lisle
Virginia Tech
Computer Science

Mark Schiferle
SUNY Buffalo
Mechanical Engineering

Julie Kent
University of Central Florida
Modeling & Simulation

Jack Miller
Iowa State University
Mechanical Engineering

Elisa Torres
George Mason University
I/O Psychology

Morgan McCombs
Massachusetts Institute of Technology
Computation for Design and Optimization

See Study Disciplines at http://www.iitsec.org/education/students-and-teachers/scholarships

Award Amounts Available for Fall 2020
- $10,000 (Doctoral Candidates)
- $5,000 (Masters Candidates)

Be our guest at I/ITSEC November 30 – December 4, 2020

Direct Further Inquiries and Provide Submissions
I/ITSEC Scholarship Program
2101 Wilson Boulevard, Suite 700
Arlington, VA 22201
(703) 247-9480 or dlangelier@ndia.org

Scholarship Chair
Janet Spruill, Aptima, Inc.
Attendee Luncheon
Lunch will be served Tuesday – Thursday at 1200. You must enter & exit luncheon through the Exhibit Hall. Full Conference registrants will receive lunch tickets with their registration materials. Exhibitors and Visitors may purchase a ticket for $35.00 at the main Registration Station. Lunch tickets are dated; you must present the current day’s lunch ticket for entry.

Connections Lounge & Grill
Stop by and relax in the Connections Lounge & Grill for a bite to eat or a refreshing drink and then connect to your email or review the I/ITSEC program online to plan your next move at the conference. Connections Lounge & Grill will be located in Booth 100, South Exhibit Hall.

Show Management Office
S220B • The Show Management Office will be staffed during show hours for all questions regarding booth space, rules, regulations, exhibitor locators, security and late/early passes. Registration will not be made available at the Show Management Office.

National Training & Simulation Association (NTSA)
Booth 2810 • The National Training and Simulation Association (NTSA) is America’s premier organization representing the interests of the modeling and simulation community. As such, it serves as a constant point of contact for government, academia, industry, research organizations and the military to exchange information, share knowledge, align business interests and in general stimulate the growth and overall dynamism of the industry.

Service Booths

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<tr>
<th>Booth</th>
<th>Location</th>
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<td>PEO STRI</td>
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<td>PM TRASYS</td>
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<td>NAWCTSD</td>
<td>249/1439</td>
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<td>USAF</td>
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<td>U.S. Army CCDC</td>
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International Pavilions

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<tr>
<td>Canada</td>
<td>1871</td>
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<tr>
<td>Australia</td>
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Healthcare Pavilion

| Pavilion Location | 2181, 2185, 2281, 2283, 2381 |

Recognizing that simulation represents a paradigm shift in health care education, SSH promotes improvements in simulation technology, educational methods, practitioner assessment and patient safety that promote better patient care and can improve patient outcome.
Innovation Showcase

Presentations within the Innovation Showcase are led by cutting-edge exhibiting companies and government agencies that are knowledgeable on the various subject matter within the M&S Industry. Be sure to stop by one of the 30-minutes sessions to hear what is new and exciting in M&S! Be sure to check the onsite schedule for any changes or updates to the Innovation Showcase schedule.

Most up-to-date information will be available on the mobile app, website and onsite during I/ITSEC.

(As of 31 October 2019)

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<thead>
<tr>
<th>Monday, 2 December • International Spotlight</th>
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<th>Tuesday, 3 December</th>
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<th>Wednesday, 4 December</th>
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Exhibitor Networking Event

Tuesday, 3 December • 1700 - 1830 • Exhibit Hall

Be sure to kick off I/ITSEC 2019 with a stop by one of the participating booths at the I/ITSEC Exhibitor Networking Event. What a great way to view the latest technology while networking with exhibitors and your fellow attendees. Be sure to check out the official I/ITSEC website and onsite signage for updated participants.

Most up-to-date information will be available on the mobile app, website and onsite during I/ITSEC.
(As of 27 October 2019)

<table>
<thead>
<tr>
<th>Booth</th>
<th>Company Name</th>
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<tbody>
<tr>
<td>381/481</td>
<td>Cole Engineering Service Inc. (CESI)</td>
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<td>407</td>
<td>Google Cloud</td>
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<tr>
<td>820</td>
<td>3D Perception</td>
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<td>1201</td>
<td>TRU Simulation &amp; Training</td>
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<td>1662</td>
<td>Improbable</td>
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<td>1748</td>
<td>Lockheed Martin</td>
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<td>1768</td>
<td>Scalable Display Technologies</td>
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<td>2300</td>
<td>Aegis Technologies Group</td>
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<td>2360</td>
<td>Team Defence Australia</td>
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<td>2401</td>
<td>Aptima, inc</td>
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<td>2810</td>
<td>National Training &amp; Simulation Association</td>
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<td>2826</td>
<td>E2M Technologies</td>
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<td>2832</td>
<td>Krauss-Maffei Wegmann</td>
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</table>
The training, education, and simulation community will once again demonstrate their game-changing innovations to key government decision makers and procurement officials at I/ITSEC 2019. A panel of government and industry members selected the most innovative white papers via an objective, competitive process. The selected demonstrators employ technological innovations, re-define training and simulation processes, or create something entirely new that is going to change the way we train, simulate and educate.

The Launch Pad Special Event targets all I/ITSEC attendees, including select government acquisition stakeholders. Acquisition program leadership and Science and Technology divisions will be at I/ITSEC to assess the Launch Pad presentations’ technology readiness levels. Speed to market is a key acquisition principle, and Launch Pad provides an opportunity to highlight technology that may be appropriate for rapid prototyping/rapid fielding initiatives.

<table>
<thead>
<tr>
<th>Tuesday, 3 December – Session 1 (Language Tools and Apps)</th>
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<tbody>
<tr>
<td>1400 Using Artificial Intelligence Technology and Personalized Services for Optimized Dynamic Language Teaching and Learning</td>
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<tr>
<td>1430 An App-based Approach for Reliably and Efficiently Bringing Users to Fluency in a New Language</td>
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<tr>
<th>Tuesday, 3 December – Session 2 (Game Engine Tools)</th>
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<tbody>
<tr>
<td>1600 One World SDK for Unity</td>
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<tr>
<td>1630 Physically Based Night Vision Goggle Sensor Simulation in Game Engine</td>
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<tr>
<th>Wednesday, 4 December – Session 3 (Augmented/Virtual Reality Tool/Robotics)</th>
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<tbody>
<tr>
<td>1400 Omni-Directional Treadmill</td>
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<tr>
<td>1430 The Robot Operating System (ROS) and the Gazebo Simulation Environment</td>
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<table>
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<tr>
<th>Wednesday, 4 December – Session 4 (Augmented and Virtual Reality Tools)</th>
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<tbody>
<tr>
<td>1600 Computer Vision on the Edge</td>
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<tr>
<td>1630 Disruptive Training Across the Spectrum of Use Cases Using Virtual Immersive Experiences</td>
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<td>Company Name</td>
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<td>3D perception</td>
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<td>3DPlaneta</td>
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<td>3D Systems Simbionix</td>
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<td>4C Strategies</td>
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<td>4CAST</td>
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<td>5DT, Inc.</td>
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<td>A. Harold &amp; Associates, LLC</td>
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<td>Acme Worldwide Enterprises, Inc.</td>
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<td>ACS Hydraulics, Inc.</td>
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<td>Adobe, Inc.</td>
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<td>Advanced Distributed Learning (Advanced Distributed Learning) Initiative</td>
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<td>Advanced IT Concepts, Inc.</td>
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<td>Advanced Simulation Technology, Inc.</td>
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<td>Advanced Tactical Training Systems</td>
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<td>Aerospace Driven Technologies, Inc.</td>
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<td>Aerotronics</td>
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<td>Air Force Technical Application Center</td>
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<td>Alion Science and Technology</td>
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<td>Ameripack</td>
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<td>Applied Training Solutions (ATS)</td>
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<td>Applied Virtual Simulations</td>
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<td>Aptima, Inc.</td>
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<td>AR/VR Pavilion</td>
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<td>ARA Virtual Heroes Division</td>
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<td>Arch Virtual</td>
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<td>Aries Security</td>
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<td>AxioLogic Solutions and Barbaricum LLC</td>
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<td>BNH Expert Software, Inc.</td>
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<td>Bugeye Technologies, Inc.</td>
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<td>CALIBRE Systems, Inc.</td>
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<td>Cervus Defence &amp; Security</td>
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<td>Chetu, Inc.</td>
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<td>Chiron Global Technologies Pty Ltd/ Kinetic Fighting Pty Ltd.</td>
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<td>Cisco Systems</td>
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<td>CodeFirm</td>
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<td>Cole Engineering Services, Inc.</td>
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<td>Command Post Technologies, Inc.</td>
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<td>Concurrent Real-Time</td>
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<td>Connections Café and Lounge</td>
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<td>Consortium Management Group, Inc. (CMG)</td>
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<td>Control Products Corporation</td>
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<td>Defense Acquisition University (DAU)</td>
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<td>Delaware Resource Group of Oklahoma, LLC</td>
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<td>Deloitte</td>
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<td>Design Concepts</td>
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<td>Diamond Visionics</td>
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<td>E2M Technologies, Inc.</td>
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<td>Eagle 6 Technical Services, LLC</td>
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<td>EBC Electronics Corp.</td>
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<td>Electric Picture Display Systems</td>
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<td>Embry-Riddle Aeronautical University</td>
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<td>Engineering &amp; Computer Simulations, Inc.</td>
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<th>Organization/Role</th>
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<tbody>
<tr>
<td>Marty Bink, Ph.D.</td>
<td>U.S. Army Research Institute</td>
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<tr>
<td>Phil Brown, Ph.D.</td>
<td>Joint Resources and Readiness Division, NORAD-USNORTHCOM</td>
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<td>Carol Byers-Bendle</td>
<td>PM TRASYS PM</td>
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<td>James Dennis, Ph.D.</td>
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<td>Jeremiah Folsom-Kovarik, Ph.D.</td>
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<td>Richard Grohs, USAF HQ ACC</td>
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<td>Holley Hagerman, JTIEC</td>
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<tr>
<td>Susan Harkrider, Modeling and Simulation Division</td>
<td>Night Vision &amp; Electronic Sensors Directorate (NVESD)</td>
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<td>Keith Henry, USAF AFAMS</td>
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<td>Mindy Hoover, Iowa State University</td>
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**Deputy Chair:** Paul Andrzejewski, HigherEchelon

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<td>Paul Andrzejewski</td>
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<td>Andre Balta</td>
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<td>Lisa Bird</td>
<td>U.S. Army PEO STRI, Virtual Training Systems</td>
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<tr>
<td>Christina Bouwens</td>
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<td>Monique Brisson</td>
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<td>Edward Degnan, Ph.D.</td>
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<td>Nina Deibler, Serco, Inc.</td>
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<td>FAAC Incorporated</td>
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<td>Capt Kathleen Haggard</td>
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<td>John Huddleston, Ph.D.</td>
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<td>David Hutchings</td>
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**Deputy Chair:** Stu Armstrong, Cole Engineering Services, Inc.

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<tr>
<td>John Aughey</td>
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<td>Amy Bair</td>
<td>HRS Consulting</td>
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<td>Maj Scotty Black, USMC</td>
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<td>Claudia Clark, Ph.D.</td>
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<td>Jeff Frost</td>
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<td>Nick Giannias, CAE</td>
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<td>Pat Hart</td>
<td>U.S. Army PEO STRI</td>
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<td>Maureen Holbert, Booz Allen Hamilton</td>
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<td>John Lee</td>
<td>Improvable</td>
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<td>Mike Robbs</td>
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<td>Capt J. Garrick Sheatzley</td>
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<td>M&amp;S Officer</td>
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<td>Alyssa Tanaka, Ph.D.</td>
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<td>Thomas Yanoschik</td>
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<td>Jimmy Moore</td>
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<td>NAVMED</td>
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<td>Andy Wasserman, US Secret Service</td>
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<td>Paul Watson, U.S. Army PEO STRI</td>
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<td>Will Wells, NAVCTSD</td>
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<td>Leigh Yu, OSD</td>
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Conference Information
About Registration
In addition to access to Tutorials, Papers, Special Events and Professional Development Workshops, registration fees cover Continuing Education Units (CEUs), lunches (T-W-Th), coffee breaks (T-W PM, W-Th AM), continental breakfasts (W-Th), and the Thursday banquet. A meeting bag with conference materials is included.

I/ITSEC Registration Services for 2019
We strive to minimize the time spent in line so you can move on to the conference events or the exhibit floor. Our goal is to make your I/ITSEC experience a pleasant one even before you enter the Orange County Convention Center (OCCC). Avoid that line and move on to what you came to I/ITSEC to do!

Traditional Registration Stations. Located in S220 of the South Concourse Registration area, traditional walk-up registration will be available for Full Service Registration, on-site payments, changes/edits to name badges, multiple badge pick-ups, or just because you prefer dealing one-to-one with a real person.

Alternate Registration Stations within the Orange County Convention Center. Limited stations at the Main Registration Station will be open Friday and Saturday to handle early registration, especially exhibitors. Conference Attendees are encouraged to wait until Sunday afternoon or use the Self Badging/Self Registration kiosks.

Self-badging printing stations will be available for those who pre-registered and received a confirmation number. To complete your registration at this station, you must be paid in full with no outstanding balance or questions remaining about your registration.

VIPs, Speakers (including Paper Presenters), Media, and International registrants will have special registration stations. More details will be provided to each group, but be sure and watch for signage pointing to these areas.

Registration outside of the Orange County Convention Center. I/ITSEC full-service satellite registration will be located at the Main Lobby of Hyatt Regency, adjacent to hotel check in, from Sunday noon through Tuesday. These stations will be staffed to assist you whether you need to start your registration from scratch or just need to pick up your nametags.

**Convention Center Parking**

**EXHIBITOR PARKING**
$17 per Day – For regular vehicles with re-entry privileges each day. Exhibitor must show badge and receipt for repeat entries.
$25 per Day – For oversized vehicles with re-entry privileges each day. Exhibitor must show badge and receipt for repeat entries.

**ATTENDEE PARKING**
$17 per Entry – For regular vehicles per entry.
$25 per Entry – For oversized vehicles per entry.

**AFTER 5PM**
$10 per Entry – For regular vehicles. Same stipulations as above.
$15 per Entry – For oversized vehicles. Same stipulations as above.

**ACCEPTED PAYMENT METHODS:**
Cash, Traveler’s Checks, American Express, MasterCard & Visa

**Dress Code**

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<th>BRANCH</th>
<th>CONFERENCE AND GENERAL SESSIONS</th>
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<tr>
<td>Army</td>
<td>ACUs or Duty Uniform</td>
<td>Army Blue <em>(Army Evening Mess Optional)</em></td>
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<td>Marine Corps</td>
<td>Service “C”</td>
<td>Evening Dress <em>(Dress Blue “B” or Service “A” Optional)</em></td>
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<tr>
<td>Navy</td>
<td>Service Khaki, Navy Service Uniform</td>
<td>Dinner Dress White <em>(Service Dress White Optional)</em></td>
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<td>Air Force</td>
<td>Blues <em>(Short or Long Sleeve)</em></td>
<td>Mess Dress or Semi-Formal</td>
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<td>Coast Guard</td>
<td>Tropical Blue Long</td>
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<tr>
<td>Civilian</td>
<td>Business Attire</td>
<td>Black Tie <em>(Optional)</em></td>
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The National Training and Simulation Association has blocked rooms with the Orlando hotels listed below. Make your lodging arrangements either on-line or by phone through onPeak, our official Housing Partner, through 24 November 2019 (18 November for Hyatt). Beginning November 25, 2019 all changes and cancellations will need to be made directly with the hotel, please refer to the policies on your confirmation for details. On or after 11 November the hotels not onPeak may charge deposits and declined credit cards are subject to cancellation. For your convenience the hotel direct phone numbers can be found in the Changes Policy section of your onPeak confirmation and will be posted on the I/ITSEC website.

*Please note the group rate expires and current room rates may apply after 24 November. onPeak is our official housing partner and the only company authorized to represent I/ITSEC and NTSA. If you are contacted by other companies who present themselves as representing the Conference or Association, please report to Debbie Langelier.

**Securing your Reservation**
- **Go to** select Official Housing Portal
- **Choose your category**: corporate, exhibitor, or government attendee
- **View** hotels.
- **Enter** your check-in and checkout dates and the available hotels will populate.
- **Choose** your preferred hotel and the program will lead you through the booking process.

Should you need to extend your stay and do not see the night available, or need assistance please contact us via https://www.onpeak.com/help.

**More Information about Lodging Arrangements**
- **Government room rates are subject to change**, based on the released per diem rate. **The Government rate will update in the fall once the new rates are released.**
- **Government Rate Room Reservations**: Require appropriate Government/Military ID, to be presented at the hotel desk upon check-in. *Rates are subject to change upon check-in without the proper credentials.*
- Some hotels may charge an additional Resort Fee to include applicable taxes, please refer to your confirmation and the hotel’s website.
- **The individual hotels are not authorized to accept reservations directly for this conference.** Please email if your preferred hotel is unavailable for assistance.
- **Guests must identify themselves as I/ITSEC Conference Attendees to receive incentives offered by the hotel for conference guests.**
- The Conference will be held at the Orange County Convention Center, in the South Concourse. The headquarter hotel is the Hyatt Regency Orlando.
  *I/ITSEC Guests booked through onPeak Receive Optional Reduced Resort Fee: $15/day at the Hyatt*
- **Shuttle buses/vans will be available throughout the conference.**

To help defray conference management costs, an assessment is included in the room rates shown with these hotels. We encourage you to make your lodging arrangements within the designated housing package established.

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1. **DoubleTree by Hilton Orlando at SeaWorld**
   - 10100 International Drive
   - Orlando, FL 32821
   - Industry: $140

2. **Embassy Suites International Drive – Convention Center**
   - 8978 International Drive
   - Orlando, FL 32819
   - Industry $155

3. **Extended Stay Deluxe Orlando – Convention Center**
   - 8750 Universal Blvd.
   - Orlando, FL 32819
   - One Rate: $91

4. **Hampton Inn - Convention Center**
   - 8900 Universal Blvd.
   - Orlando, FL 32819
   - Industry: $138

5. **Hilton Orlando**
   - 6001 Destination Parkway
   - Orlando, FL 32819
   - Industry: $247

6. **Homewood Suites by Hilton International Drive**
   - 8745 International Drive
   - Orlando, FL 32819
   - Industry: $148

7. **Hyatt Place Orlando/Convention Center**
   - 8741 International Drive
   - Orlando, FL 32819
   - One Rate: $142

8. **Hyatt Regency Orlando (Conference Headquarters)**
   - 9801 International Drive
   - Orlando, FL 32819
   - Industry: $257

9. **Residence Inn Orlando Convention Center**
   - 8800 Universal Blvd.
   - Orlando, FL 32819
   - Industry: $154

10. **Rosen Centre Hotel**
    - 9840 International Drive
    - Orlando, FL 32819
    - Industry: $214*

11. **Rosen Inn at Pointe Orlando**
    - 9000 International Drive
    - Orlando, FL 32819
    - One Rate: $83

12. **Rosen Plaza**
    - 9700 International Drive
    - Orlando, FL 32819-8114
    - Industry: $202*

13. **Springhill Suites Orlando Convention Center**
    - 8840 Universal Blvd.
    - Orlando, FL 32819
    - Industry: $154*

* A limited amount of rooms offered at the Government per diem rate.
To get from your hotel to the South Concourse of the OCCC, you have several choices of transportation.

- I/ITSEC will provide shuttle bus service to all properties listed. (Schedules will be available at the hotels and at the entrance to the conference registration area.)

- Reasonable public transportation is available on the I-Ride trolley bus along International Drive. Check [http://www.iridetrolley.com](http://www.iridetrolley.com) or your hotel for schedules.

- Your own or a rented vehicle. See page 95 for detailed parking information.

- Most of the hotels are within walking distance (wear comfortable shoes).

The National Training and Simulation Association has arranged for the Hertz Company to be the official car rental agency for I/ITSEC with the special rates below. You can also make your reservations on-line through the I/ITSEC website (Lodging/Travel). Vehicles may be returned to any Hertz location in Florida at no additional charge.

<table>
<thead>
<tr>
<th>CAR CLASS</th>
<th>DAILY</th>
<th>WEEKEND</th>
<th>WEEKLY</th>
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<tbody>
<tr>
<td>A Economy</td>
<td>$39</td>
<td>$19</td>
<td>$169</td>
</tr>
<tr>
<td>B Compact</td>
<td>$42</td>
<td>$21</td>
<td>$174</td>
</tr>
<tr>
<td>C Midsize</td>
<td>$45</td>
<td>$23</td>
<td>$184</td>
</tr>
<tr>
<td>D Standard 2/4-Door</td>
<td>$49</td>
<td>$25</td>
<td>$194</td>
</tr>
<tr>
<td>F Full Size 4-Door</td>
<td>$55</td>
<td>$33</td>
<td>$205</td>
</tr>
<tr>
<td>G Premium</td>
<td>$69</td>
<td>$69</td>
<td>$345</td>
</tr>
<tr>
<td>I Luxury</td>
<td>$89</td>
<td>$89</td>
<td>$399</td>
</tr>
<tr>
<td>Q4 Midsize SUV</td>
<td>$62</td>
<td>$62</td>
<td>$299</td>
</tr>
<tr>
<td>L Standard SUV</td>
<td>$74</td>
<td>$74</td>
<td>$339</td>
</tr>
<tr>
<td>R Minivan 2WD</td>
<td>$79</td>
<td>$79</td>
<td>$399</td>
</tr>
<tr>
<td>U Convertible</td>
<td>$75</td>
<td>$75</td>
<td>$413</td>
</tr>
<tr>
<td>T Large SUV</td>
<td>$115</td>
<td>$115</td>
<td>$549</td>
</tr>
<tr>
<td>T6 PRM XCAP SUV</td>
<td>$130</td>
<td>$130</td>
<td>$715</td>
</tr>
</tbody>
</table>
Advertising Opportunities: Official Publications of I/ITSEC

Now more than ever, with the increased challenges facing the defense and security marketplace, you need to keep your organization’s message in front of its target audience. Reach the leading decision-makers at the world’s largest simulation, training and modeling event of the year by advertising your products and services in the Official Publications of I/ITSEC.

Advertising in these publications is an excellent way to stand out in the crowd and invite the attendees to visit your exhibit, product demonstration and/or website. Then after the event has ended, these publications are used by many as desk-references, so your advertisement will reach the decision-makers long after the conference is over.

I/ITSEC Proceedings
The I/ITSEC Knowledge Repository provides a valuable link to the I/ITSEC training, simulation and education community. Access the online papers repository available at www.iitsec.org post-conference.

Stay in Touch
Free Wireless hot spots. E-mail/Internet Kiosks.
Complimentary internet, WiFi and email access in the lobby (look for signage). Internet Kiosks available in main lobby near registration. If you need access outside of the complimentary stations, all of OCCC is now WiFi enabled for a modest user fee.

The National Training and Simulation Association’s Annual Simulation & Training Trends and Technology Review – I/ITSEC Exhibitor Directory
This publication will be available to all the attendees, exhibitors, and exhibit visitors at I/ITSEC. It will be placed in the attendees’ conference bags and available at registration, and other locations at the convention center. As an added bonus, your ad will also appear in the December Issue of National Defense Magazine — exposure beyond the walls of the convention center. National Defense is sent to over 62,159 BPA audited readers, including the members of NTSA. (Directory section will not appear in National Defense Magazine).

The I/ITSEC Show Daily
Advertise in this year’s Daily and be noticed by your customers and potential partners who are attending I/ITSEC. The I/ITSEC Show Daily informs the simulation & training community on breaking events & happenings on-site at I/ITSEC. It is printed overnight and distributed daily at the conference center, choice hotels, and uploaded to the I/ITSEC website. The daily has evolved into a vital part of I/ITSEC, a “must read” while attending the conference. Stop in to Media Room, S210E for more information.

Use both to give your company Unequalled Exposure
Special packages have been created so your organization can take advantage of both opportunities!

Web Banners
A limited number of banner ad spaces are available on the I/ITSEC website.

Kathleen Kenney (703) 247-2576 • kkeney@ndia.org
or Alex Mitchell (703) 247-2568 • amitchell@ndia.org • Booth 2810

I/ITSEC is the premier annual event of its kind, attendance by the mainstream and specialist trade press is heavy, resulting in coverage that reaches your key marketing targets. Our media staff stands ready to assist you in achieving maximum exposure during your time at I/ITSEC. Corporate representatives are invited to bring their marketing materials to the Media Room for distribution as early as possible after the opening of registration. Additional exhibitor presentations will be made available inside the exhibit hall at the Innovation Showcase, Booth 2588.

Prior to the conference, contact John Williams at (703) 362-7005 or jwilliams@ndia.org; check out more details on the I/ITSEC News page at http://www.iitsec.org. The I/ITSEC Media Room is S210E, phone (407) 685-4013.
National Training and Simulation Association

The NTSA, an affiliate of NDIA, represents and promotes the business interests of companies in the simulation, training, mission planning/rehearsal, and support services industry. NTSA's corporate and individual members enjoy reduced fees on all NTSA events and services, as well as a monthly e-newsletter (Training Industry News) and National Defense magazine. Sustaining and Regular Corporate members receive early space selection and discounts on exhibit space at I/ITSEC. Individual memberships are also available.

For membership information, call Carol Dwyer at (703) 247-9471 or email at cdwyer@ndia.org. Visit the NTSA website TrainingSystems.org.

Certified Modeling and Simulation Professional

EVENTS AT I/ITSEC

STATE OF THE CMSP NATION MEETING
Wednesday, December 4, 1000 – 1100, Room S210D
Join the CMSP discussion with a newly formed CMSP 3.0 review committee.

CMSP WORKSHOP
Friday, December 6, 0800 – 1200, Room S331A
This workshop describes the CMSP application, philosophy behind the exam and delves into sample exam questions.

CMSP CERTIFICATION
Requirements: 3-8 years work experience, CMSP application, resume, 3 letters of recommendation, and successful completion of the CMSP exam. Certification is good for 4 years after which recertification is required.

For more information, visit SimProfessional.org or contact Carol Dwyer at cdwyer@NDIA.org.

National Defense Industrial Association

Based in Arlington, Virginia, the National Defense Industrial Association (NDIA) is a non-profit, educational association representing industry, government, and academia. 1,700 companies and 75,000 individuals rely on NDIA for networking, knowledge, and business development opportunities. As the nation’s leading defense industry association, NDIA promotes collaboration to deliver cutting-edge technology, weapons, equipment, training and support to warfighters and first responders. Through events, divisions, regional chapters and three affiliate organizations, NDIA convenes ethical forums connecting experts from government, academia and the defense industry to define threats and design solutions to ensure U.S. and partner national security.

For NDIA membership information visit www.ndia.org or contact Zoila Martinez at zmartinez@ndia.org.

Women In Defense

Women In Defense (WID) strengthens the Defense Industrial Base and workforce by promoting programming that creates and enhances opportunities for women, increasing diversity within the defense community. WID’s two-fold mission focuses on empowering women currently working in defense and encouraging talented young women to pursue careers in National Security.

Membership is open to women and men whose primary professional activities impact the national security of the United States and its partners and allies. WID’s 22 chapters include members from defense companies; all branches of the U.S. Armed Forces; government; academia; think tanks; associations; and professional services. Active military and government employees receive complimentary membership.

www.womenindefense.net
Security Training before the Conference

Technology collection directives contain mandates requiring exhibitors and presenters to receive a counterintelligence (CI) briefing from their CI support staff prior to I/ITSEC. Contractors with classified contracts may contact their Defense Security Service Special Agents. To avoid security breaches, I/ITSEC presenters and exhibitors should ensure that the required briefing has been received. A list of CI support agencies follows. Please contact your security officer/manager and ensure that an appropriate briefing for yourself and your colleagues is arranged. Providers of the briefings are:

<table>
<thead>
<tr>
<th>Provider</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Army</td>
<td>902 Military Intelligence</td>
</tr>
<tr>
<td>Navy, USMC, Coast Guard</td>
<td>Naval Criminal Investigative Service</td>
</tr>
<tr>
<td>Air Force</td>
<td>Air Force Office of Special Investigation</td>
</tr>
<tr>
<td>Contractors</td>
<td>Defense Counterintelligence and Security Agency (formerly Defense Security Service)</td>
</tr>
</tbody>
</table>

Personal Security

The most important thing to protect, of course, is yourself. Pay attention to your surroundings. Report suspicious behavior or security breaches to a security person or NTSA staff. Familiarize yourself with emergency procedures and exits at your hotel and the Convention Center. Please note that security surveillance cameras are in place throughout the conference and exhibit areas.

Emergency Medical Services

EMT and/or paramedics will be on-site during I/ITSEC (including hall build-up and teardown). During I/ITSEC 2019, they will be located on the same level as Registration, near the escalators between S220 and S230. Dial 911 for life threatening emergencies. For non-emergencies within the center, dial 5-9809 or on your cell dial (407) 685-9809, or alert any security or I/ITSEC staff member with a radio.

Bags and Briefcases

Bags and briefcases may be carried in by those wearing Conference Attendee or Exhibitor badges. Exhibit Visitors (those who are only visiting the exhibits) WILL NOT be allowed to carry in bags or briefcases. A check room will be available in the main registration area. A small purse or fanny pack is allowed, but is subject to search. Additional security restrictions may be posted on http://www.iitsec.org and on signage at the conference. Conference Management reserves the right to adjust security levels as deemed necessary during the conference.

Presentations

Recording devices will not be permitted in the presentation rooms, unless authorized by the conference management. Presenters and Exhibitors should review their company’s policy documents and those of the government agencies with whom you contract regarding open distribution, limited distribution, restricted distribution and sharing limitations.

Cameras

Exhibitors have the right to limit photographs and videos of their displays. Please respect this right by asking before photographing or videotaping. Participants found taking photos or videos without the consent of the subject presentors or exhibitors will be dealt with according to security procedures, to possibly include confiscation of materials and removal from the premises.

Inquiries (before the conference)

Registration (702) 798-8340 • Exhibit/Sponsorship (703) 247-9473 • All other inquiries (703) 247-9480
Earle L. Denton Memorial Golf Tournament
Organized by Central Florida Chapter NDIA • Sunday, 1 December OR Monday, 2 December

Shingle Creek
GOLF CLUB

Rosen Shingle Creek Golf Club
9939 Universal Blvd, Orlando, FL 32819 • 407-996-9933 • www.shinglecreekgolf.com

Limited Availability – Register early!

<table>
<thead>
<tr>
<th>Deadlines</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Golf On-Line Registration</td>
<td>22 November</td>
</tr>
<tr>
<td>Sponsorship</td>
<td>19 November</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tournament Time</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunday</td>
<td>1100 Registration 1230 Shotgun</td>
</tr>
<tr>
<td>Monday</td>
<td>0630 Registration 0730 Shotgun</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Point of Contact</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Debbie Berry 407-748-3807</td>
<td><a href="mailto:debbie.berry@lmco.com">debbie.berry@lmco.com</a></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Format</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Captain’s Choice / Scramble</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pairings &amp; Requests</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Final assignments and pairings will be made by the tournament coordinator. Priority is based upon receipt of payment.</td>
<td></td>
</tr>
</tbody>
</table>

NOTE: To guarantee requested pairings, all golfers (two, three or four) MUST be entered during a single login session. Golfers registering separately MUST clearly specify pairing requests under comments. The tournament coordinator will attempt to honor all requests.

<table>
<thead>
<tr>
<th>Cancellations</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Must be received via email to <a href="mailto:debbie.berry@lmco.com">debbie.berry@lmco.com</a> by close of business 15 November to receive 50% refund. No refunds thereafter. Substitute golfers are permitted.</td>
<td></td>
</tr>
</tbody>
</table>

On-Line Registration

- Register and/or select sponsorship at www.iitsec.org/ATTENDEES/PLANNINGYOURSTAY/Pages/default.aspx
- Register one to four players per login.
- Special promotions listed on registration site are valid through October 18.

Fees

$100 per player (green fees, range balls, cart, lunch)

Coordinate club rentals directly with the Rosen Shingle Creek Golf Club pro shop.

Sponsorships

Details available at www.iitsec.org

<table>
<thead>
<tr>
<th>Sponsorship Type</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hole Sponsor</td>
<td>$500</td>
</tr>
<tr>
<td>Beverage Cart</td>
<td>$2,500</td>
</tr>
<tr>
<td>Hole-in-One</td>
<td>$2,500</td>
</tr>
<tr>
<td>Boxed Lunch</td>
<td>$3,000</td>
</tr>
</tbody>
</table>

Sponsors

Send your logos via email to debbie.berry@lmco.com no later than 19 November. Do not bring your own sign.

*Scholarships and additional qualified initiatives supported through tournament proceeds; for a full list of initiatives (STEM, Wounded Warriors, etc.) supported, please visit: http://www.ndia-cfl.org.*
WEDNESDAY, DECEMBER 4, 2019
Orange County Convention Center
5:30AM Packet Pickup • 6:45AM Start Time

WEBSITE:
http://www.iitsec.org/attendees/planningyourstay
www.facebook.com/iitsec5k

All registered runners will receive a custom race tech shirt, finishers race medal, race bib and official timing by Milestone Race Authority, and pre- and post-race refreshments. Tax-deductible registration.

EARLY REGISTRATION
August 18 – November 8
$30
(shirt size subject to availability)

November 9 – November 22
$35
(shirt size subject to availability)

November 23 – Onsite
$40
(shirt size subject to availability)

CHARITIES THE 5K WILL SUPPORT
Camaraderie Foundation
I/ITSEC STEM Initiative

Email Sean Osmond for Race Information at iitsec5k@gmail.com or Shannon Burch for Sponsorship information at sburch@ndia.org
See You Next Year!
Save the Date!
November 30 - December 4, 2020
www.iitsec.org
CALL FOR PAPERS AND TUTORIALS
I/ITSEC 2020
THE FUTURE IS NOW

ABSTRACT DEADLINE: 1 MARCH 2020

Subcommittees/Categories
• Education
• Emerging Concepts & Innovative Technologies
• Human Performance, Analysis and Engineering
• Policy, Standards, Management & Acquisition
• Simulation
• Training

Tutorials
Information on core M&S, training and education topics suitable for management and technical personnel.

The submission process for the I/ITSEC Papers and Tutorials coincide. Submittal details will vary slightly, but the milestones will match.

Follow the Papers/Tutorials Completion Process for 2020 Abstract Submittal which will be posted in December.

http://www.iitsec.org/authors

I/ITSEC 2020 Program Chair
Matt Spruill
Trideum Corporation
757-617-4219 | mspruill@trideum.com

I/ITSEC 2020 Tutorial Board Co-chairs
David Milewski
CAE USA MSI
757-224-5491 | dave.milewski@caemsi.com

Lisa Scott Holt, Ph.D.
Intelligent Automation, Inc.
301-294-5212 | lholt@i-a-i.com
SERIOUS GAMES
SHOWCASE & CHALLENGE

Submissions Open August 2020
Compete for prestigious awards including:
Innovation Award | People's Choice | Students' Choice | Best XR | Best in Category

Showcase your work to education and training leaders, and top gaming and software companies.
Orange County Convention Center NOV 30 - DEC 4, 2020

More Information: sgschallenge@gmail.com

www.sgschallenge.com | www.iitsec.org
I/ITSEC Honors all VETERANS Past, Present and Future

SPONSORED BY

Google Cloud

Thank you to our 5K Sponsors for their support of the Camaraderie Foundation and I/ITSEC STEM Initiative

ASTi
AVT Simulation
Contec Americas
Diamond Visionics
E2M Technologies Inc.
Huntington Ingalls
Integration Innovation, Inc. (i3)

Ravenwood
Senspex, Inc.
Trideum
Twin Oaks Computing
Wittenstein
Yet Analytics Inc
Zenetex