

# I/ITSEC | INTERSERVICE/INDUSTRY TRAINING, SIMULATION & EDUCATION CONFERENCE

**WINNING THE WAR OF COGNITION  
BY PUSHING READINESS AND LETHALITY BOUNDARIES**



*Be sure to check  
inside the front  
cover for your  
Pocket Guide.*

## PROGRAM GUIDE





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## WELCOME ATTENDEES OF I/ITSEC 2019



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](http://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



**General Stephen W. Wilson**  
Vice Chief of Staff of  
the United States  
Air Force

### 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.



**Mark Matthews**  
President, Quantum3D  
Government Systems

### 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.

### Opening Ceremonies

**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

**1030-1200**

Vice Admiral Luke McCollum, USN  
Major General James A. Jacobson, USAF  
Major General William F. Mullen, USMC  
Brigadier General Stephen Michael, USA  
Fred Drummond, SES  
Brigadier General Ilamrs Lejins, NATO



## Conference Chairs



**Brian Holmes**  
I/ITSEC 2019  
Conference Chair

**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 NAWCTSD). 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**  
I/ITSEC 2019  
Program Chair

**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.

## Conference Sponsor



**RADM James Robb,**  
**USN (Ret.)**  
President National  
Training and  
Simulation  
Association

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.



**General Herbert J.**  
**Carlisle, USAF (Ret.)**  
President and  
Chief Executive  
Officer  
National Defense  
Industrial  
Association

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.

#### 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, AFSOC, AFGSC 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 AIM-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 Future Readiness and Assignment Officer, Human Resources Command; the Missile Defense Agency's Ter-

restrial 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  
(MARCORSYSCOM) 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





TIME		LOCATION
0800	Exhibitor Registration Open	South Concourse, S220CDE
1700	Exhibitor Registration Close	

THURSDAY, 28 NOVEMBER 2019  
CLOSED FOR THANKSGIVING

FRIDAY, 29 NOVEMBER AND SATURDAY, 30 NOVEMBER 2019

TIME		LOCATION
0800	Exhibitor Registration Open	South Concourse, S220CDE
1700	Exhibitor Registration Close	

SUNDAY, 1 DECEMBER 2019

TIME		LOCATION
0800	Exhibitor Registration Open	South Concourse, S220CDE
1200	Conference Registration Open	South Concourse, S220CDE
1200	Satellite Registration Open	Hyatt Regency Main Lobby
1800	All Registrations Close	

## Dress Code

BRANCH	CONFERENCE AND GENERAL SESSIONS	BANQUET
Army	ACUs or Duty Uniform	Army Blue ( <i>Army Evening Mess Optional</i> )
Marine Corps	Service "C"	Evening Dress ( <i>Dress Blue "B" or Service "A" Optional</i> )
Navy	Service Khaki, Navy Service Uniform	Dinner Dress White ( <i>Service Dress White Optional</i> )
Air Force	Blues ( <i>Short or Long Sleeve</i> )	Mess Dress or Semi-Formal
Coast Guard	Tropical Blue Long	Dinner Dress White ( <i>Service Dress White Optional</i> )
Civilian	Business Attire	Black Tie ( <i>Optional</i> ) or International Traditional Costume





TIME		LOCATION
0700	Conference and Exhibit Registration Open	South Concourse, S220CDE
0730	Satellite Registration Open	Hyatt Regency Main Lobby
<b>0830 - 1000</b>	<b>TUTORIALS</b> (Synopsis begin on page 50)	
	A Comprehensive Introduction to Medical Simulation (1910)	Room S320B
	Live, Virtual and Constructive (LVC) Simulation Interoperability 101 (1931)	Room S320C
	TENA/JMETC: Live-Virtual-Constructive Integration for Test and Training (1928)	Room S320D
	Cybersecurity in LVC (1917)	Room S320E
	Introduction to DoD Modeling and Simulation (M&S) (1923)	Room S320F
	An Introduction to Cognitive Systems for Modeling & Simulation (1914)	Room S320GH
<b>1030 - 1200</b>	<b>SIGNATURE EVENT 1:</b> Congressional Modeling and Simulation Event (page 15)	Room S330BCD
<b>1245 - 1415</b>	<b>TUTORIALS</b> (Synopsis begin on page 53)	
	M&S Case Study Analysis: Design for Additive Manufacturing & 3D Printing (1920)	Room S320B
	Distributed LVC Event Integration and Execution Process (1911)	Room S320C
	Distributed Interactive Simulation (DIS) 101 (1937)	Room S320D
	Risk Management Framework: Cyber Security Compliance for Modeling, Simulation and Training Systems (1939)	Room S320E
	Addressing the Challenges of Rigorous Simulation Validation (1941)	Room S320F
	Artificial Intelligence: Past, Present, Capabilities and Limitations (1919)	Room S320GH
1400	Exhibits Open	Exhibit Hall
<b>1430 - 1600</b>	<b>TUTORIALS</b> (Synopsis begin on page 56)	
	Location, Location, Location: Big Data, Artificial Intelligence and Analytics in the Cloud (1936)	Room S320B
	A Functional Approach to Distributed Network Architectures for LVC (1922)	Room S320C
	Introduction to HLA (1916)	Room S320D
	Simulation Conceptual Modeling Theory and Use Cases (1943)	Room S320E
	Design of Experiments: Applications for the Simulation Profession (1918)	Room S320F
	Superforecasting: Proven Practices for Leveraging Human Ingenuity (1921)	Room S320GH
<b>1600 - 1730</b>	<b>SIGNATURE EVENT 2:</b> I/ITSEC Fellow 2019 (page 16)	Room S310C
1800	Exhibits Close	
1800	All Registration Stations Close	



TIME		LOCATION
0700	Conference and Exhibit Registration Open	South Concourse, S220CDE
0700	Satellite Registration Open	Hyatt Regency Main Lobby
0830 - 1000	<b>OPENING CEREMONIES</b>	Hyatt Regency Windermere Ballroom
	Call to Order Presentation of Colors National Anthem Invocation  <b>OPENING REMARKS</b> Brian Holmes, 2019 Conference Chair  <b>KEYNOTE ADDRESSES</b>	
	 <b>General Stephen W. Wilson</b> Vice Chief of Staff of the United States Air Force	 <b>Mark Matthews</b> President Quantum3D Government Systems
1030 - 1200	<b>SIGNATURE EVENT 3:</b> Senior Leader Panel (page 17)	Hyatt Regency Windermere Ballroom
1200	Exhibits Open	Exhibit Hall
1200 - 1330	<b>Lunch</b> (Opening of Exhibits and Lunch will occur at 1200 or upon adjournment of the General/Flag Officer Panel)	South Hall B
1400 - 1530	<b>PAPER SESSIONS</b> (Title/Author list begins on page 63. Session schedules for this timeframe are on page 59.)	Room S320ABCDEF
1400 - 1530	<b>SIGNATURE EVENT 4:</b> Air Force General Officer Panel (page 18)	Room S330BCD
1400 - 1530	<b>FOCUS EVENT 2:</b> Best from Around the Globe (page 28)	Room S320D
1400 - 1530	<b>FOCUS EVENT 3:</b> Acquisition Agility (page 29)	Room S320GH
1400 - 1530	<b>FOCUS EVENT 4:</b> Ignite! (page 30)	Room S330EF
1400 - 1530	<b>COMMUNITY OF INTEREST 1:</b> Conceptual Modeling of Adaptive Instructional Systems (IEEE Project 2247.1) (page 40)	Room S329
1400	<b>LAUNCH PAD:</b> Using Artificial Intelligence Technology and Personalized Services for Optimized Dynamic Language Teaching and Learning	Exhibit Hall – Booth 793
1430	<b>LAUNCH PAD:</b> An App-based Approach for Reliably and Efficiently Bringing Users to Fluency in a New Language	Exhibit Hall – Booth 793
1600 - 1730	<b>PAPER SESSIONS</b> (Title/Author list begins on page 63. Session schedules for this timeframe are on page 59.)	Room S320ABCDEF
1600 - 1730	<b>SIGNATURE EVENT 5:</b> 5G – From Hype to Reality (page 19)	Room S310C
1600 - 1730	<b>FOCUS EVENT 5:</b> Big Data in Training (page 31)	Room S320GH
1600 - 1730	<b>COMMUNITY OF INTEREST 2:</b> The European Perspective on Battlelabs and the Role of Simulation (page 40)	Room S329
1600 - 1730	<b>PROGRAM BRIEF 1:</b> Air Force Acquisition Update (page 44)	Room S330EF
1600	<b>LAUNCH PAD:</b> One World SDK for Unity	Exhibit Hall – Booth 793
1600	Satellite Registration Stations at Hyatt Close	
1630	<b>LAUNCH PAD:</b> Physically Based Night Vision Goggle Sensor Simulation in Game Engine	Exhibit Hall – Booth 793
1700 - 1830	Exhibitor Networking Event	Exhibit Hall
1800	Convention Center Registration Closes	
1800	Senior Leaders Networking Hour and M&S Awards Dinner ( <i>invitation only</i> )	Hyatt Regency
1830	Exhibits Close	



TIME		LOCATION
0630	5K Walk, Run or Roll Charity Race	OCCC
0700	Conference and Exhibit Registration Open	South Concourse, S220CDE
0830 - 1000	<b>PAPER SESSIONS</b> (Title/Author list begins on page 63. Session schedules for this timeframe are on page 60.)	Room S320ABCDEF
0830 - 1000	<b>SIGNATURE EVENT 6:</b> The Impact of Data and Simulations for 21 <sup>st</sup> Century Warfare (page 20)	Room S310AB
0830 - 1200	<b>SIGNATURE EVENT 7:</b> AI Game Theory: Game Changing or Game Over? (USSOCOM) (page 21)	Room S330EF
0830 - 1000	<b>FOCUS EVENT 6:</b> Imagine 2030: AI-Empowered Learning (page 32)	Room S320GH
0830 - 1000	<b>COMMUNITY OF INTEREST 3:</b> Adaptive Instructional System Interoperability Standards (IEEE Project 2247.2) (page 41)	Room S329
0830 - 1000	<b>PROGRAM BRIEF 2:</b> U.S. Army PEO STRI TSIS Update (page 44)	Room S330BCD
0930	Exhibits Open	Exhibit Hall
1030 - 1200	<b>PAPER SESSIONS</b> (Title/Author list begins on page 63. Session schedules for this timeframe are on page 60.)	Room S320ABCDEF
1030 - 1200	<b>SIGNATURE EVENT 8:</b> Navy Flag Officer Panel – The Navy the Nation Needs Now (page 22)	Room S330BCD
1030 - 1200	<b>FOCUS EVENT 7:</b> Perspectives on Competency-Based Learning (page 33)	Room S310C
1030 - 1200	<b>COMMUNITY OF INTEREST 4:</b> Learning Engineering: A New Academic Discipline and Engineering Profession (page 41)	Room S329
1200 - 1330	Lunch	South Hall B
1230 - 1400	UCF/FIEA Games in Simulation Panel	Room S329
1400 - 1530	<b>PAPER SESSIONS</b> (Title/Author list begins on page 63. Session schedules for this timeframe are on page 61.)	Room S320ABCDEF
1400 - 1530	<b>SIGNATURE EVENT 9:</b> Alignment of Army M&S Across the M&S Enterprise and the Army Future Force Modernization Enterprise (page 23)	Room S310AB
1400 - 1530	<b>SIGNATURE EVENT 10:</b> Multi-domain Battlespace Training (page 24)	Room S330BCD
1400 - 1530	<b>FOCUS EVENT 8:</b> Patient Safety in Healthcare: The Role of Modeling and Simulation (page 34)	Room S310C
1400 - 1530	<b>FOCUS EVENT 9:</b> Multinational Perspectives on Live, Virtual and Constructive Implementation in Ops (page 35)	Room S330EF
1400	<b>LAUNCH PAD:</b> Omni-Directional Treadmill	Exhibit Hall – Booth 793
1430	<b>LAUNCH PAD:</b> The Robot Operating System (ROS) and the Gazebo Simulation Environment	Exhibit Hall – Booth 793
1600 - 1730	<b>PAPER SESSIONS</b> (Title/Author list begins on page 63. Session schedules for this timeframe are on page 61.)	Room S320ABCDEF
1600 - 1730	<b>FOCUS EVENT 10:</b> Black Swan: To Tell the Truth, I've Got a Secret (page 36)	Room S310AB
1600 - 1730	<b>COMMUNITY OF INTEREST 5:</b> Best Practices for the Evaluation of Adaptive Instructional Systems (IEEE Project 2247.3) (page 42)	Room S329
1600 - 1730	<b>PROGRAM BRIEF 2:</b> U.S. Army PEO STRI TSIS Update (page 44)	Room S330BCD
1600 - 1730	Future Leaders Presentations (FLP)	Room S320F
1600	<b>LAUNCH PAD:</b> Computer Vision on the Edge	Exhibit Hall – Booth 793
1630	<b>LAUNCH PAD:</b> Disruptive Training Across the Spectrum of Use Cases Using Virtual Immersive Experiences	Exhibit Hall – Booth 793
1800	All Registration Stations Close	
1800	Exhibits Close	



TIME		LOCATION
0800	Conference and Exhibit Registration Open	South Concourse, S220CDE
0830 - 1000	<b>PAPER SESSIONS</b> (Title/Author list begins on page 63. Session schedules for this timeframe are on page 62.)	Room S320ABCDEF
0830 - 1000	<b>SIGNATURE EVENT 11:</b> Improving Joint and Multinational Simulation Interoperability (page 25)	Room S310AB
0830 - 1200	<b>SIGNATURE EVENT 12:</b> Air Force Simulators Pitch Day (page 26)	Room S320GH
0830 - 1000	<b>FOCUS EVENT 11:</b> Modernizing Learning (page 37)	Room S329
0830 - 1000	<b>COMMUNITY OF INTEREST 6:</b> Simulation Standards and SISO (page 43)	Room S310C
0830 - 1000	<b>PROGRAM BRIEF 3:</b> Navy Vision from the Training System's Program Offices (page 44)	Room S330EF
0930	Exhibits Open	Exhibit Hall
1000 - 1130	<b>FOCUS EVENT 1:</b> Iron Dev (page 27)	Exhibit Hall – Booth 793
1030 - 1200	<b>PAPER SESSIONS</b> (Title/Author list begins on page 63. Session schedules for this timeframe are on page 62.)	Room S320ABCDEF
1030 - 1200	<b>FOCUS EVENT 12:</b> Immersive Environments — Suspending Disbelief (page 38)	Room S330EF
1030 - 1200	<b>COMMUNITY OF INTEREST 7:</b> Geospatial Forum (page 43)	Room S310C
1200 - 1330	Lunch	South Hall B
1300	Serious Games Showcase and Challenge Awards Ceremony	Innovation Showcase Booth 2588
1330 - 1500	<b>PAPER SESSIONS</b> (Title/Author list begins on page 63. Session schedules for this timeframe are on page 62.)	Room S320ABCDEF
1330 - 1500	<b>FOCUS EVENT 13:</b> New and Emerging Augmentation Technologies for Training and Operations within the NATO Alliance Nations (page 39)	Room S310C
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 <i>Reception &amp; Awards</i> 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	Hyatt Regency Windermere Ballroom

## FRIDAY, 6 DECEMBER 2019

TIME	PROFESSIONAL DEVELOPMENT WORKSHOPS (Synopsis on pages 71 - 73)	LOCATION
0800 - 1630	PDW1: CyberTRAINsitions	Room S330EF
0800 - 1200	PDW2: Certified Modeling & Simulation Professional (CMSP)	Room S331A
0800 - 1200	PDW3: Harnessing the Power of Data Analytics to Optimize Training	Room S331B
0800 - 1200	PDW4: Live-Virtual-Constructive (LVC) Interoperability Techniques	Room S331C
0800 - 1200	PDW5: Serious Game Design Workshop	Room S331D
0800 - 1200	PDW6: Team and Collective Training Needs Analysis (TCTNA)	Room S330G
0800 - 1200	PDW7: Using ROI-Focused Design Thinking to Deliver Impact Results	Room S330H
0800 - 1130	PDW1.1: Cyberspace Training: Is This Even Legal?	Room S330EF
1300 - 1530	PDW1.2: Blockchain in Simulation: Managing Innovations in Training, Games, Health and IoT	Room S330EF



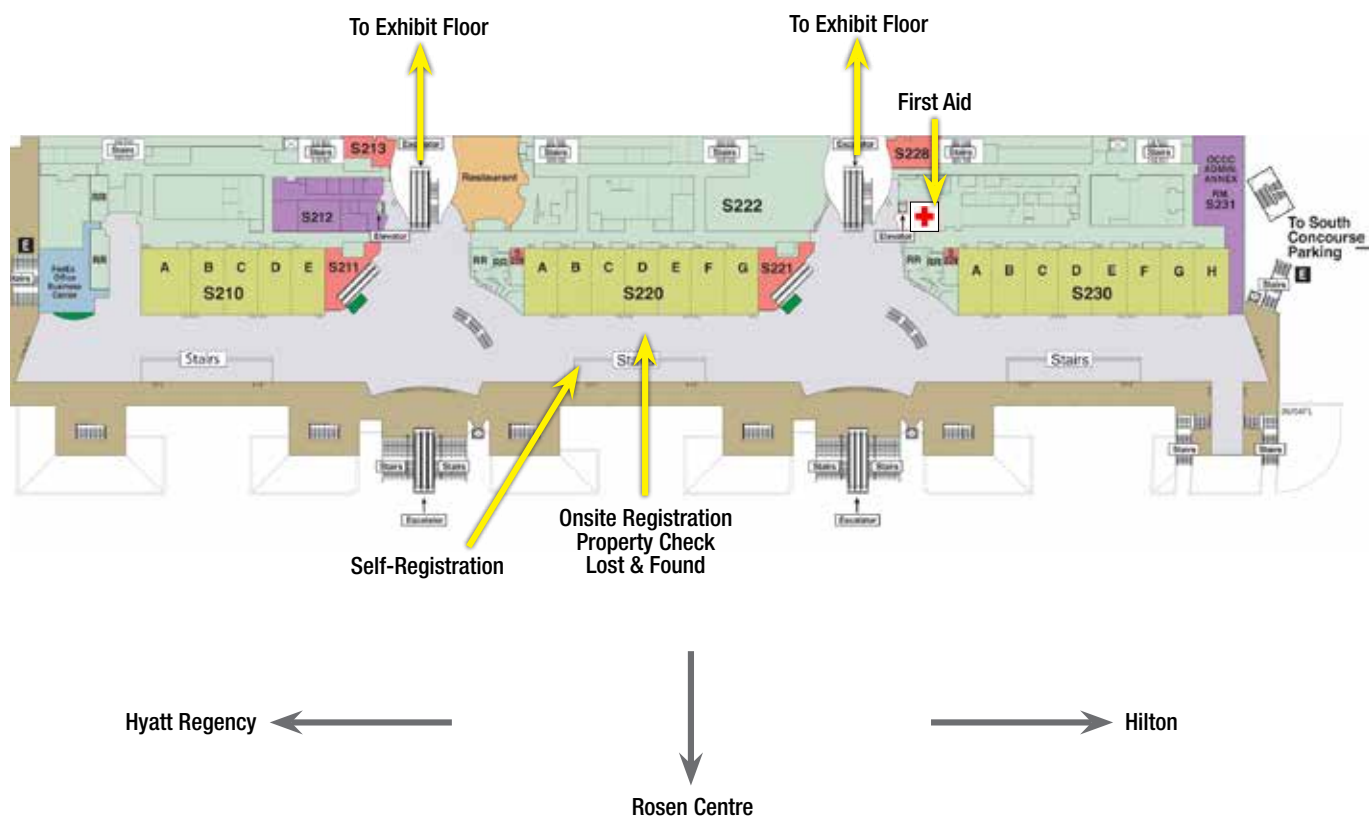
## South Concourse

Orange County Convention Center, Orlando, Florida

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

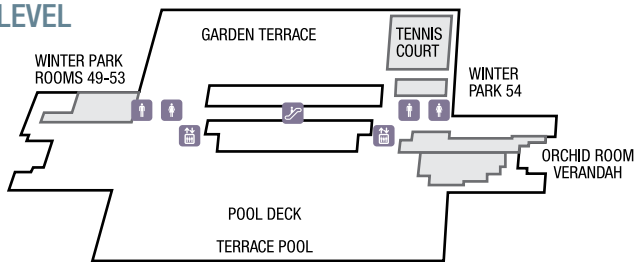
### LEVEL 2 (Entry / Registration / Exhibit Hall)



### LEVEL 3 (Tutorials / Presentations / Events / Practice Rooms / Professional Development Workshops)



## RECREATION LEVEL



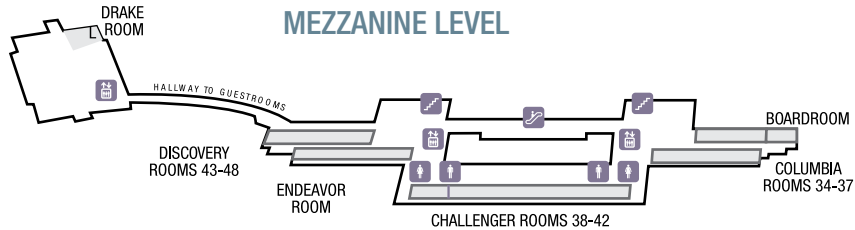
### KEY

- Restrooms
- Escalator
- Stairway
- Elevator
- Information
- ATM

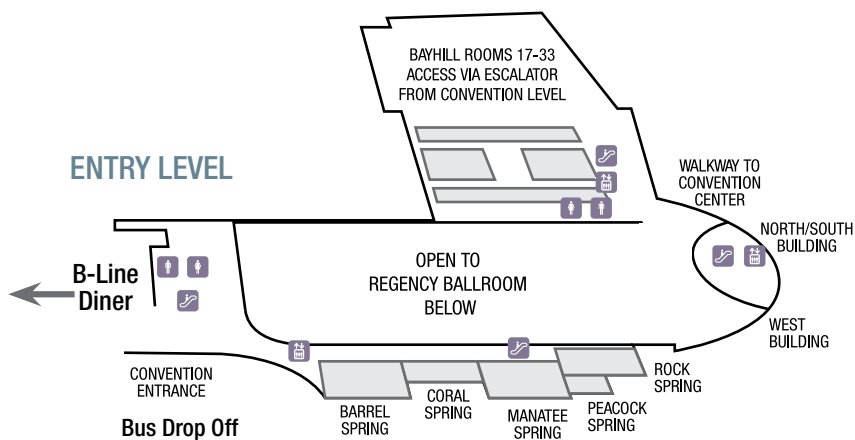


HYATT REGENCY

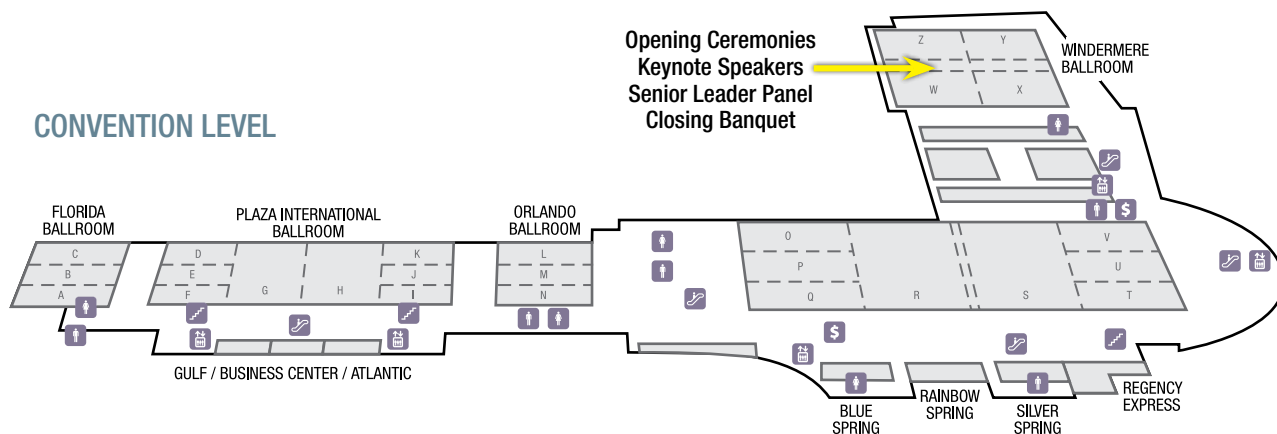
## MEZZANINE LEVEL



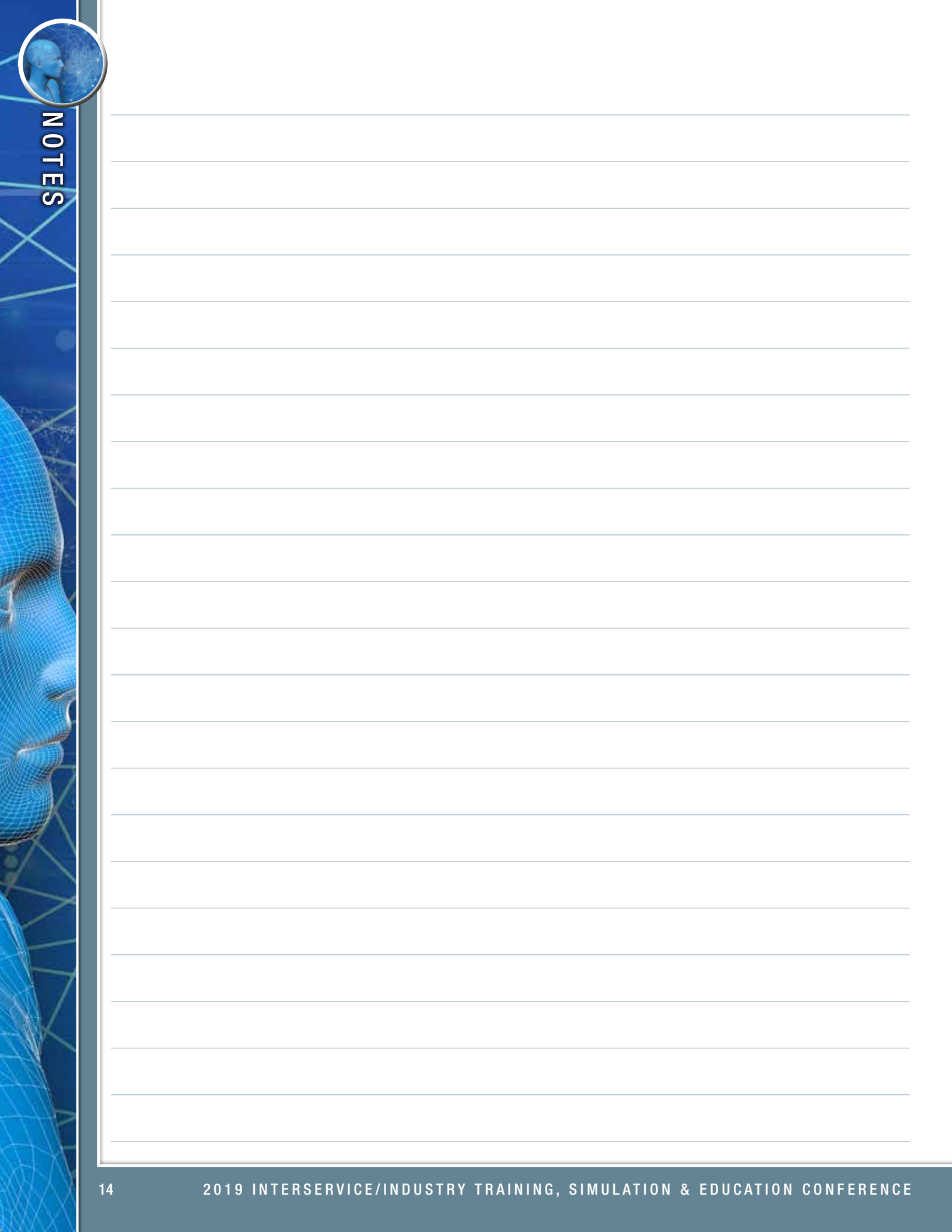
## ENTRY LEVEL



## CONVENTION LEVEL







A blue wireframe profile of a human head on the left side of the page, with a circular inset at the top left showing a smaller profile of a head with a starry background. The word "NOTES" is written vertically in white capital letters next to the main profile. The rest of the page is a large white area with horizontal blue lines for writing. At the bottom, there is a dark blue footer bar with white text.

NOTES

14

2019 INTERSERVICE/INDUSTRY TRAINING, SIMULATION & EDUCATION CONFERENCE

The image is a full-page background for a document. It features a blue color scheme. On the left side, there is a vertical strip containing a wireframe model of a human head in profile, facing right. Above this, there is a circular inset showing a person's profile against a starry, night-sky background. The word "NOTES" is written vertically in white, bold, capital letters along the left edge of the page. The main body of the page is white and contains horizontal lines for writing. At the bottom of the page, there is a dark blue footer bar with white text.

NOTES

14

2019 INTERSERVICE/INDUSTRY TRAINING, SIMULATION & EDUCATION CONFERENCE



# Special Events



# Congressional Modeling and Simulation Event



SIGNATURE EVENT

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

MONDAY, 2 DECEMBER  
1030 – 1200 • ROOM S330BCD  
SE1

Session Chair:  
Keith Henry, Air Force Agency  
for Modeling and Simulation  
(AFAMS)

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:*

	<b>Bobby Scott*</b> Caucus Co-Chair Virginia 3rd District		<b>Robert Aderholt*</b> Alabama 4th District		<b>Steve Cohen*</b> Tennessee 9th District		<b>Duncan Hunter</b> California 50th District		<b>Marco Rubio</b> Florida
	<b>Stephanie Murphy*</b> Caucus Co-Chair Florida 7th District		<b>Jack Bergman</b> Michigan 1st District		<b>Mike Conaway*</b> Texas 11th District		<b>Tim Kaine</b> Virginia		<b>C.A. Dutch Ruppersberger*</b> Maryland 2nd District
	<b>John Rutherford*</b> Caucus Co-Chair Florida 4th District		<b>Gus Bilirakis*</b> Florida 12th District		<b>John Cornyn</b> Texas		<b>Doug Lamborn*</b> Colorado 5th District		<b>Mark Warner</b> Virginia
	<b>Martha Roby*</b> Caucus Co-Chair Alabama 2nd District		<b>Mo Brooks*</b> Alabama 5th District		<b>Ted Cruz</b> Texas		<b>Elaine Luria</b> Virginia 2nd District		<b>Elizabeth Warren</b> Massachusetts
			<b>Vern Buchanan*</b> Florida 16th District		<b>Susan Davis*</b> California 53rd District		<b>Ed Markey</b> Massachusetts		<b>Joe Wilson*</b> South Carolina 2nd District
			<b>Ken Calvert*</b> California 42nd District		<b>Dianne Feinstein</b> California		<b>Scott Peters*</b> California 52nd District		<b>Robert Wittman*</b> Virginia 1st District
			<b>John Carter*</b> Texas 31st District		<b>Virginia Foxx*</b> North Carolina 5th District		<b>Bill Posey*</b> Florida 8th District		

*\*denotes members of the Congressional M&S Caucus*



*The Congressional panel addresses the audience and visits the exhibit floor during I/ITSEC.*





# I/ITSEC Fellow 2019

MONDAY, 2 DECEMBER  
1600 – 1730 • ROOM S310C  
SE2

## 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.

### I/ITSEC 2019 Fellow



Richard Fujimoto, Ph.D.



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.

Session Chair:  
Margaret Loper, Georgia Tech  
Research Institute

# Senior Leader Panel

TUESDAY, 3 DECEMBER  
1030 – 1200 • HYATT REGENCY  
WINDERMERE BALLROOM  
SE3

## Moderator

**Rear Admiral James A. Robb, USN (Ret.)**  
President, National Training and Simulation Association



RADM Robb, USN (Ret.)



VADM McCollum, USN



Maj Gen Jacobson, USAF



MajGen Mullen, USMC

## Panelists

**Vice Admiral Luke McCollum, USN**

Chief of Navy Reserve

**Major General James A. Jacobson, USAF**

Director of Training and Readiness, Deputy Chief of Staff for Operations

**Major General William F. Mullen, USMC**

Commanding General, Training and Education Command

**Brigadier General Stephen Michael, USA**

Deputy Commanding General, U.S. Army Combined Arms Center - Training

**Fred Drummond, SES**

Deputy Assistant Secretary of Defense (Force Education and Training), Office of the Secretary of Defense

**Brigadier General Ilmars Leijns, NATO**

*Latvian Armed Forces*  
ACOS Joint Force Development at NATO Allied Command Transformation



BG Michael, USA



Mr. Drummond, SES



BGEN Leijns, NATO

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.



SIGNATURE EVENT





# Air Force General Officer Panel

## SENIOR LEADER PERSPECTIVES ON READINESS AND LETHALITY

TUESDAY, 3 DECEMBER  
1400 – 1530 • ROOM S330BCD  
SE4

### Moderator

**Colonel Robert Epstein,**  
Commander, Air Force  
Agency for Modeling and  
Simulation

### Panelists

#### **Major General James Jacobson**

Director of Training and Readiness, Deputy  
Chief of Staff for Operations Headquarters  
U.S. Air Force

#### **Major General Kevin A. Huyck** *(Invited)*

Director of Operations, Headquarters Air  
Combat Command

#### **Major General Corey J. Martin** *(Invited)*

Director of Operations, Strategic Deterrence  
and Nuclear Integration, Headquarters Air  
Mobility Command

#### **Brigadier General William A. Spangenthal**

*(Invited)*

Director of Operations and  
Communications, Headquarters Air  
Education and Training Command

#### **Brigadier General DeAnna M. Burt** *(Invited)*

Director of Operations and  
Communications, Headquarters Air Force  
Space Command

#### **Brigadier General Jason R. Armagost** *(Invited)*

Director of Operations and  
Communications, Headquarters Air Force  
Global Strike Command

#### **Brigadier General Brenda P. Cartier** *(Invited)*

Director of Operations, Headquarters Air  
Force Special Operations Command



Maj Gen Jacobson



Maj Gen Huyck



Maj Gen Martin



Brig Gen Spangenthal



Brig Gen Burt



Brig Gen Armagost



Brig Gen Cartier

This event will provide an opportunity for I/ITSEC participants to engage directly with Air Force senior leaders regarding current and planned activities related to the Air Force's Operational Training Infrastructure. Participants in this panel will be senior leaders (General Officers or Senior Executive Service members) representing the Operations Directorates (A3) of 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 from the viewpoints of their respective MAJCOMs.

Session Chair:  
Ronald Moore, Leidos



# 5G — From Hype to Reality



SIGNATURE EVENT

TUESDAY, 3 DECEMBER  
1600 – 1730 • ROOM S310C  
SE5

## Moderator

**Fred Drummond, SES**

Deputy Assistant Secretary  
of Defense (Force Education  
& Training), Office of the  
Secretary of Defense

## Panelists

**Major General Maria Gervais**

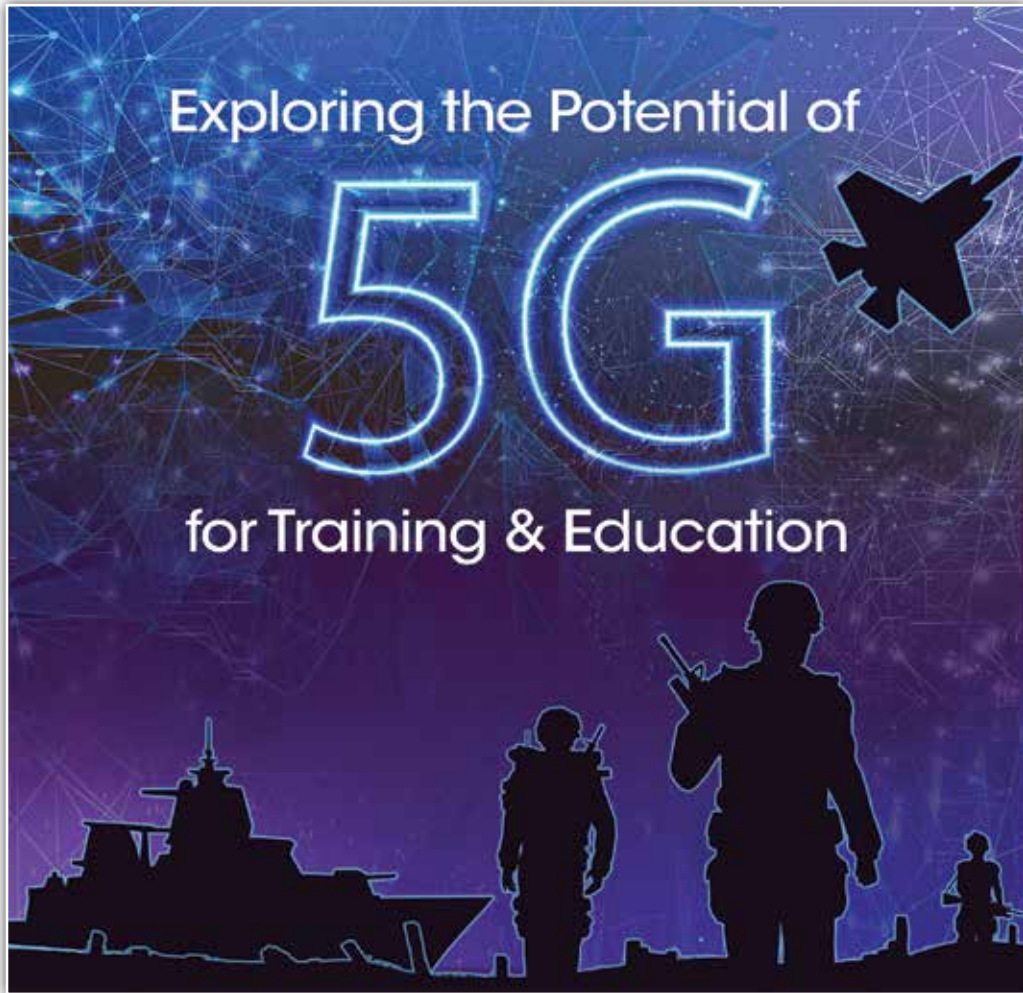
Director, Synthetic Training  
Environment Cross  
Functional Team, U.S. Army  
Futures Command

**Ellen Purdy**

Director, Emerging  
Capabilities & Prototyping  
Initiatives & Analysis, Office  
of the Secretary of Defense  
(R&E)

**Sal D'Itri**

Chairman, National  
Spectrum Consortium



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?

Session Chair:  
Amy Bair, HRS Consulting Inc.



# The Impact of Data and Simulations for 21<sup>st</sup> Century Warfare

DATA IS A CRITICAL ASSET: LEARN WHY AND WHAT NEEDS TO BE DONE!

WEDNESDAY, 4 DECEMBER  
0830 – 1000 • ROOM S310AB  
SE6

## Moderator

**Robert Siegfried, Ph.D.**

Chief Executive Officer,  
Aditerna

Vice-Chair, NATO Modelling  
and Simulation Group

Co-Chair, MSG-164 (“MSaaS  
Phase 2”)



## Panelists

**William Forrest Crain, Ph.D.,  
SES**

Director, Center for Army  
Analysis

**Tom Irwin, Ph.D., SES**

Executive Director, Joint  
Force Development and  
Design Integration,  
U.S. Joint Staff J7

**Stuart Whitehead, SES**

Deputy Director, Cyber and  
C4 Integration, U.S. Joint  
Staff J6

**Daniel T. Maxwell, Ph.D.**

President, KaDSci LLC

**Michael Mifsud**

Product Manager, Business  
Analyst and Innovator  
Defence | Security |  
Transport, Deloitte UK



Dr. Siegfried



Dr. Crain



Dr. Irwin



Mr. Whitehead



Dr. Maxwell



Mr. Mifsud

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 21<sup>st</sup> 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 21<sup>st</sup> 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.

Session Chair:  
Sean Carey, USAF/AMC/A3TD



# AI Game Theory: Game Changing or Game Over? (USSOCCOM)

## 3D AND AI TECHNOLOGIES CHANGING THE GAME

WEDNESDAY, 4 DECEMBER  
0830 – 1000 PANEL DISCUSSION  
1015 – 1200 Q&A  
ROOM S330EF  
SE7

### Moderator

**Randy K. Jackson**

Chief, Mission Preparation,  
J3 Training and Education,  
U.S. Special Operations  
Command

### Panelists

**Major General Robert  
Karmazin, USA**

U.S. Special Operations  
Command

**David Spirk, SES**

Chief Data Officer, U.S.  
Special Operations  
Command

**Colonel Russell Voce, USAF**

Deputy Chief Information  
Officer, U.S. Special  
Operations Command



MG Karmazin, USA



Mr. Spirk



Col Voce, USAF

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?

Session Chair:  
Jeremiah Folsom-Kovarik, Soar  
Technology



SIGNATURE EVENT



# Navy Flag Officer Panel – The Navy the Nation Needs Now

## PIVOT SPEED LETHALITY

WEDNESDAY, 4 DECEMBER  
1030 – 1200 • ROOM S330BCD  
SE8

### Moderator

**Rear Admiral James A. Robb, USN (Ret.)**

President, National Training and Simulation Association

### Panelists

**RADM Kyle Cozad (Invited)**

Chief of Naval Education and Training

**RDML Dan Dwyer**

Chief of Naval Air Training

**RDML Frederick Luchtman**

Physiological Episodes Action Team Lead

**RADM Gregory Harris**

Director, Air Warfare (N98)



RADM Robb, USN (Ret.)



RADM Cozad



RDML Dwyer



RDML Luchtman



RADM Harris

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 Secretary of the Navy Richard V. Spencer called for the Department of the Navy to "become and remain a continual learning organization, because that is how you maintain Warfighting Readiness and excel 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. As Secretary Spencer said to senior Naval Officers, "people are foundational to everything we do. We could have the best processes in the world. We could have the best ships, airplanes, rifles, and tanks – but they are nothing without the people who operate and maintain them. The Department of the Navy is dedicated to recruiting, training, and retaining the best America has to offer, at every level..."

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."

**Session Chair:**  
Jeremiah Folsom-Kovarik, Soar Technology

# 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



COL Gilman



Dr. Crain



Mr. Diem, SES



Mr. Manis

## 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



COL Nolan



Ms. Mongold



LTC Kavetsky



Mr. Quesenberry

## 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.

Session Chair:  
John Dzenutis, The Boeing  
Company





# Multi-domain Battlespace Training

## INTEGRATING CYBER INTO YOUR EXERCISES

WEDNESDAY, 4 DECEMBER  
1400 – 1530 • ROOM S330BCD  
SE10

### Moderators

**David “Fuzzy” Wells, Ph.D.,  
CMSP**

Deputy Director, University  
of Central Florida Institute  
for Simulation and Training

**Derek Bryan**

President, Ingenia Services,  
Inc.

### Speakers

**Lieutenant General Christopher  
Weggeman**

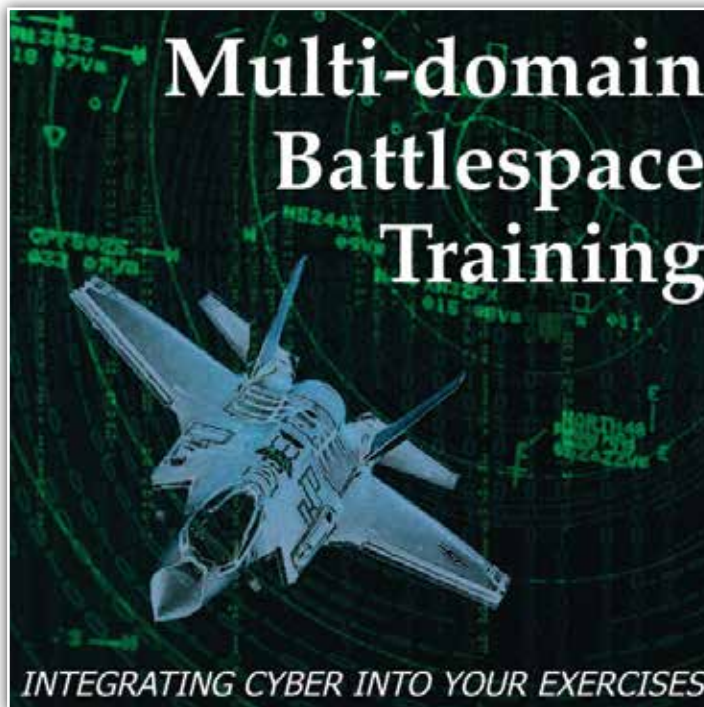
Deputy Commander, Air  
Combat Command

**Jennifer McArdle**

Non-Resident Fellow, Center  
for Strategic and Budgetary  
Assessments

**Lieutenant Colonel Chad Bates,  
Ph.D.**

Chief, Modeling and  
Simulation Division,  
U.S. Army Cyber Command



Lt. Gen. Weggeman



Ms. McArdle



LTC Bates, Ph.D.

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.

**Session Chair:**  
**Josh Looper, USAF**



# Improving Joint and Multinational Simulation Interoperability

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

THURSDAY 5 DECEMBER  
0830 - 1000 • ROOM S310AB  
SE11

### Moderator

**Richard "Jenks" Reid**

Demonstrations Branch  
Chief, U.S. Joint Staff J6,  
DDC51, Joint Fires Division



Mr. Reid



Mr. Whitehead



MG Karmazin



CDRE Norris



Mr. Culton

### Panelists

**Stuart Whitehead**

Deputy Director for Cyber  
and Command, Control,  
Communications and  
Computers Integration, Joint  
Staff J6

**Major General Robert A.  
Karmazin**

U.S. Special Operations  
Command

**Commodore Allison Norris**

Director General, Australian  
Defence Simulation and  
Training Centre

**Terrence (Terry) E. Culton**

Chief, Environment  
Architecture, Deputy Director  
Joint Training, The Joint Staff  
J7

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.

Session Chair:  
Sue Numrich, Institute for Defense  
Analyses



# Air Force Simulators Pitch Day

INNOVATION AT THE SPEED OF RELEVANCE

**MEDIA DAY SESSION**  
**THURSDAY, 5 DECEMBER**  
**0830 – 1200 • ROOM S320GH**  
**SE12**

**Colonel Philip Carpenter**  
Senior Materiel Leader,  
Simulators Program Office,  
Air Force Life Cycle  
Management Center



Col Carpenter



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.

Session Chair:  
Peter Swan, VT MAK

## 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.

Session Chair:  
Kara Orvis, Aptima, Inc.





## Best from Around the Globe

TUESDAY, 3 DECEMBER  
1400 – 1530 • ROOM S320D  
FE2

### Presenters

MODSIM WORLD

Ivar Oswalt, Ph.D., CMSP

The MIL Corporation

Tim Cooley, Ph.D.

DynamX Consulting

ITEC

Jeanine Vlasblom

Netherlands Aerospace

Centre NLR



**B**est 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.

Session Chair:  
Amanda Davies, Interim Chair,  
Policing & Security, Rabdan  
Academy, UAE

# Acquisition Agility

## THE NAVY WAY



FOCUS EVENT

TUESDAY, 3 DECEMBER  
1400 – 1530 • ROOM S320GH

FE3

### Moderator

**Mike Merritt**

Acquisition Director, Naval  
Air Warfare Center Training  
Systems Division

### Participants

**Captain Frank Futcher**

Director, NavalX

**Commander Sam “Chubs” Gray**

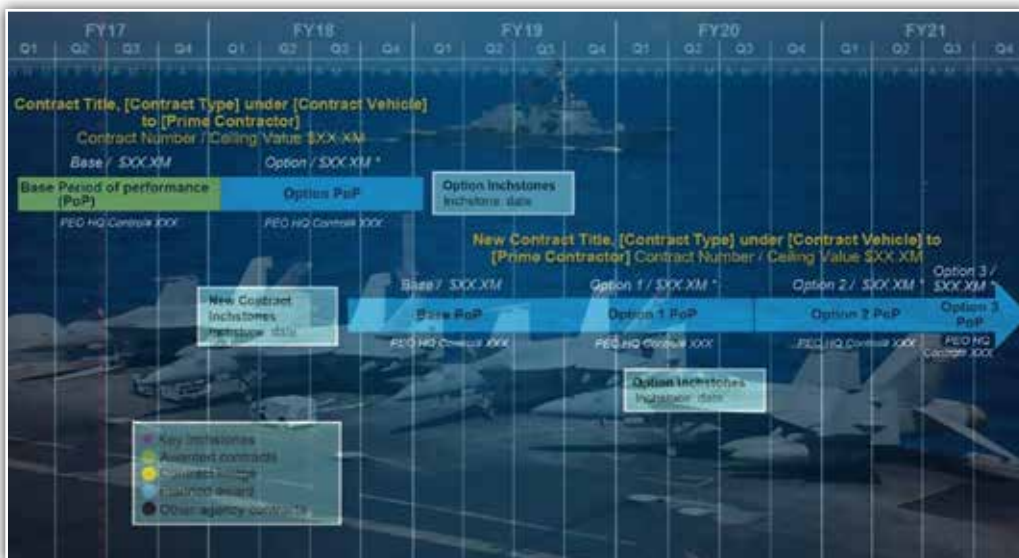
Tech Bridge Director, NavalX

**Bob Seltzer**

Director Research and  
Technology Programs, Naval  
Air Warfare Center Training  
Systems Division

**Greg Dougherty**

Director of Contracts/Chief  
of the Contracting Office,  
Naval Air Warfare Center  
Training Systems Division



The Department of the Navy (DON) recognizes it lacks the agility needed to assure relevancy 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.

Session Chair:  
Eric Jarabak, PM TRASYS ENG



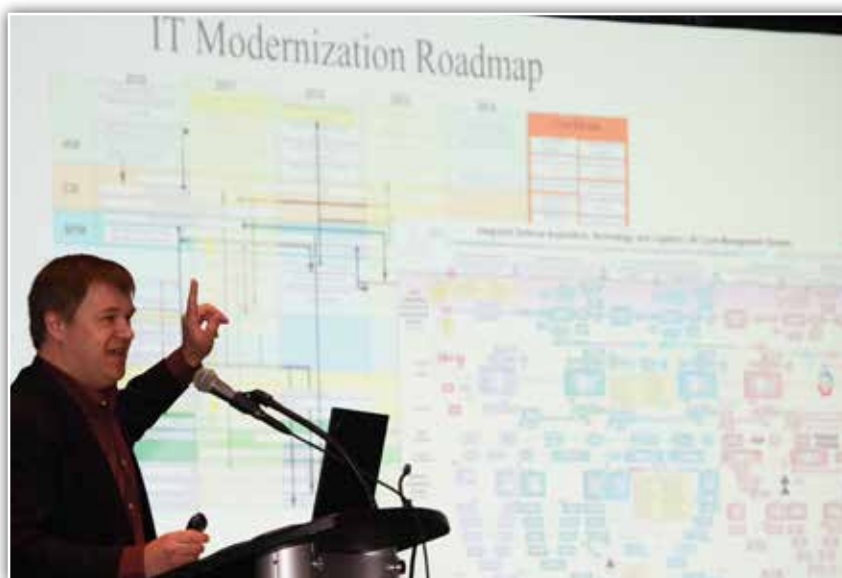
# Ignite!

## ENLIGHTEN US, BUT MAKE IT QUICK!

TUESDAY, 3 DECEMBER  
1400 – 1530 • ROOM S330EF  
FE4

### Moderator

**John Aughey**  
Associate Technical Fellow,  
The Boeing Company



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?*

Session Chair:  
Aaron Presnall, Jefferson  
Institute



## WHAT'S IN IT FOR ME?

Senior Engineer, Army  
Futures Command – Combat  
Capabilities Development  
Command, Simulation and  
Training Technology Center



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# Imagine 2030: AI-Empowered Learning

## FIRST-OF-ITS-KIND DISCUSSION

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.

Session Chair:  
Heather Oonk, Pacific Science &  
Engineering Group

# Perspectives on Competency-Based Learning



FOCUS EVENT

## ENABLING PRECISION TRAINING

WEDNESDAY, 4 DECEMBER  
1030 – 1200 • ROOM S310C  
FE7

### Moderator

**Barb Buck, Ph.D.**

Human Systems Lead, The  
Boeing Company

### Panelists

**Winston “Wink” Bennett, Ph.D.**

Readiness Science and  
Technology Product Line  
Leader, U.S. Air Force  
Research Laboratory

**Jim Pharmer, Ph.D.**

Research Director, Naval  
Air Warfare Center, Training  
Systems Division

**Naomi Boyer, Ph.D.**

Director, Digital Credential  
Products, Education Design  
Lab

**Athan Katsandres**

Senior Flight Standards Pilot,  
The Boeing Company

**Jim Gilkeson, Ph.D., CFA**

Integrated Business  
Department Chair, University  
of Central Florida College of  
Business



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.

Session Chair:  
Matthew Hackett,  
U.S. Army Research Institute  
ARL/HRED/SSTC





# Patient Safety in Healthcare: The Role of Modeling and Simulation

## INCREASING PATIENT SAFETY THROUGH SIMULATION

WEDNESDAY, 4 DECEMBER  
1400 – 1530 • ROOM S310C  
FE8

### 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





# Black Swan: To Tell the Truth, I've got a Secret

## DEEP FAKE VIDEOS AND THE INSIDER THREAT

WEDNESDAY, 4 DECEMBER  
1600 – 1730 • ROOM S310AB  
FE10

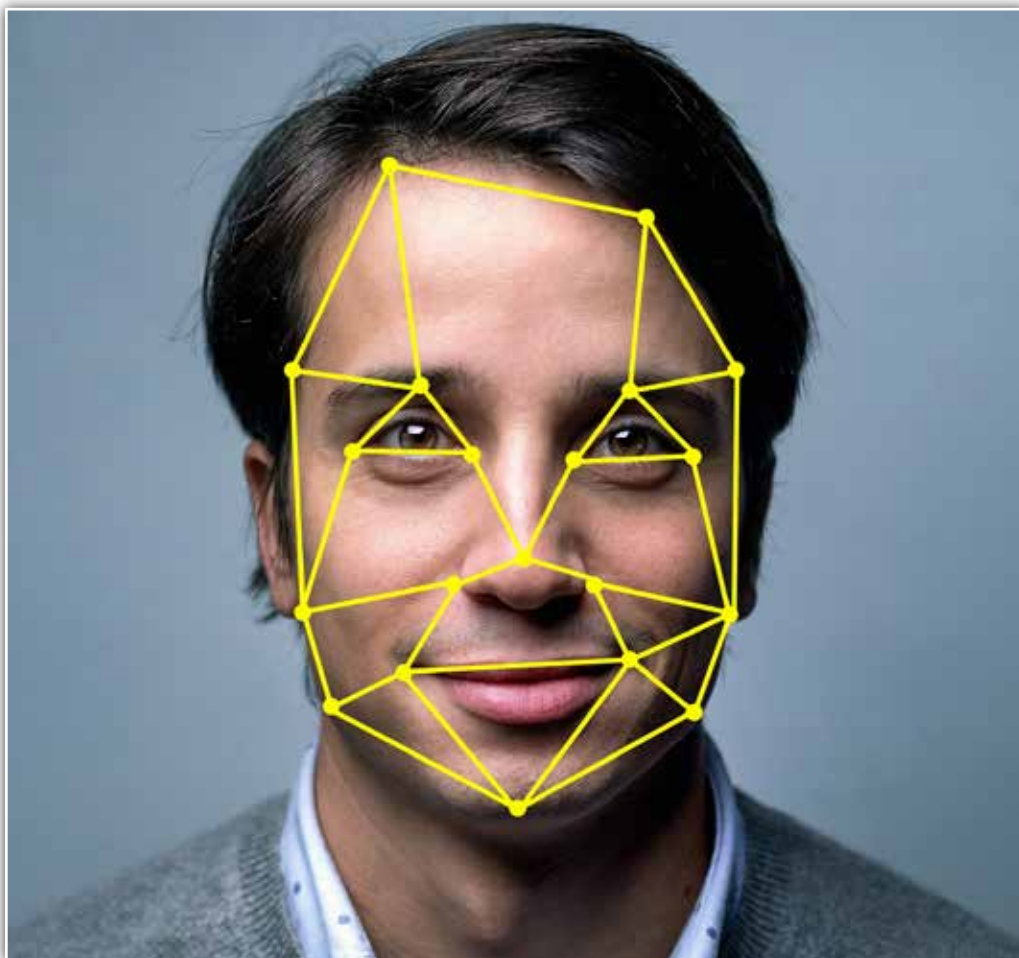
### Moderator

**Michael van Lent, Ph.D.**  
President and Chief  
Executive Officer, Soar  
Technology

### Panelists

**Josef Schaff, DSc.**  
NAWCAD Lead Autonomy  
Architect, U.S. Navy  
NAVAIR Associate Fellow

**John Mendoza**  
Deputy Director Insider  
Threat Office, U.S. Air Force



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.

Session Chair:  
Nina Deibler, Serco, Inc.

Please join us for this engaging session!



# Modernizing Learning



FOCUS EVENT

## BUILDING THE FUTURE LEARNING ECOSYSTEM

THURSDAY, 5 DECEMBER  
0830 – 1000 • ROOM S329  
FE11

### Moderator

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

### Panelists

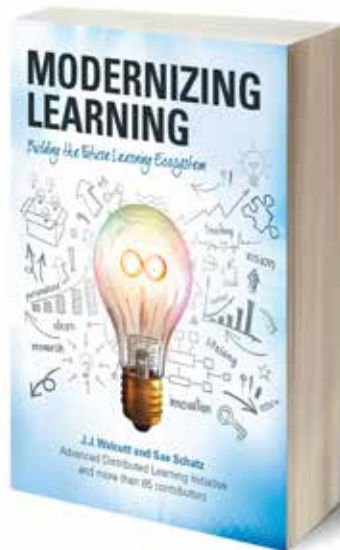
**Phill Miller**  
Chief Learning and  
Innovation Officer,  
Blackboard

**Christopher Dede, Ed.D.**  
Timothy E. Wirth Professor  
in Learning Technologies,  
Harvard Graduate School of  
Education

**Arlyn “Reese” Madsen, Jr.**  
CHCO Council Senior  
Advisor for Talent  
Development, DoD  
Intelligence and Security  
Chief Learning Officer

**Michelle Barrett, Ph.D.**  
Vice President, Research  
Technology, Data Science,  
and Analytics at ACT

**Jason Tyszko**  
Vice President, Center for  
Education and Workforce,  
U.S. Chamber of Commerce  
Foundation



Dr. Schatz



Mr. Miller



Dr. Dede



Mr. Madsen



Dr. Barrett



Mr. Tyszko

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.

Session Chair:  
Mike Thorpe, SERCO, Inc.

# Immersive Environments — Suspending Disbelief

## EXPANDING OUR HORIZONS

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.

Session Chair:  
Monique Brisson, USAF



# New and Emerging Augmentation Technologies for Training and Operations within the NATO Alliance Nations

## SHOWCASING 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)

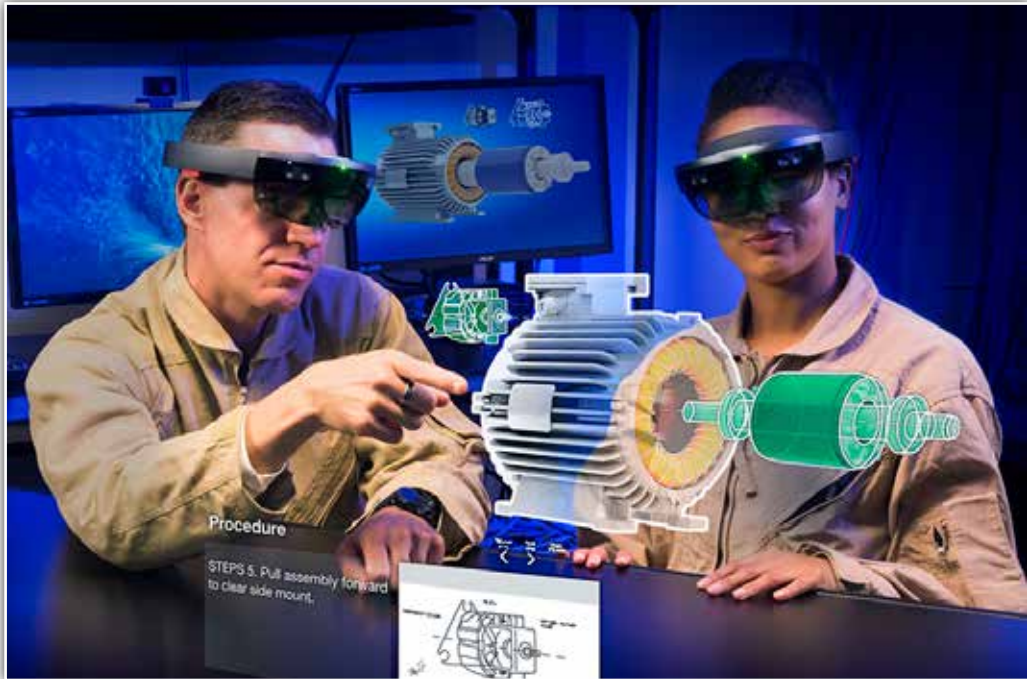
**Glenn Gunzelmann, Ph.D.**  
RTG Member U.S. Air Force  
Research Laboratory (United  
States)

**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 I/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 Sannandjeji and Emily Smits*)
- Intelligent Automation (*Bob Pokorny, Chad Zalkin, Jeff Kish and Lisa Holt*)
- Soar Technology (*Alyssa Tanaka*)
- Charles River Analytics (*Caroline Kingsley, Arthur Wollocko 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



FOCUS  
EVENT



## 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 Sottolare, Ph.D.**

Science Director, Intelligent Training, Soar Technology

### Panelists

**Xiangu 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

Session Chair: Marty Bink, University of Georgia

## 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, Think 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: Leslie Dubow, VHA EES

## Adaptive Instructional System Interoperability Standards (IEEE Project 2247.2)

This event will 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

[View panelist papers through the I/ITSEC 2019 Mobile App.](#)

### 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

Session Chair: Randy Jensen, Stottler Henke Associates Inc.

## 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

[View panelist papers through the I/ITSEC 2019 Mobile App.](#)

### 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 Schmorow, Ph.D.**

Chief Scientist and Executive Vice President, Soar Technology

**Michelle Barrett, Ph.D.**

Vice President, Research Technology, Data Science, and Analytics, ACT Inc.

Session Chair: Andrew Koch, NAWCAD



# Best Practices for the Evaluation of Adaptive Instructional Systems (IEEE Project 2247.3)

COMMUNITY OF INTEREST

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 (ITs), 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 question 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 Schutzmeister**

Senior Research Analyst, Defense Modeling and Simulation  
Coordination Office

### Panelists

**Earl Miller**

Branch Chief, Special Operations Forces Planning, Rehearsal,  
and Execution Preparation, U.S. SOCOM

**Tom Creel, Ph.D.**

SFN Executive, National Geospatial Intelligence Agency

**David Graham**

Chair, Common Data Base Standards Working Group,  
Open Geospatial Consortium

**Glen Quesenberry**


Army Geospatial Center

**Lilian Campbell-Wynn, Ph.D.**

Advisor, LVC Operations, Air Force Agency for Modeling and  
Simulation

Session Chair: Richard Grohs, USAF, HQ ACC/A5T





TUESDAY, 3 DECEMBER  
1600 – 1730  
ROOM S330EF  
PB1

## 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

WEDNESDAY, 4 DECEMBER  
0830 – 1000 AND  
1600 – 1730  
ROOM S330BCD  
PB2

## U.S. Army PEO STRI TSIS Update

Session Chair:  
Amy Motko,  
Carley Corporation

The U.S. Army Program Executive Office for Simulation, 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

WEDNESDAY 4 DECEMBER • 0830 – 1000

**0830 - 0900 Brigadier General Michael Sloane, USA**

Program Executive Officer  
Simulation, Training and  
Instrumentation

**0900 - 0930 Colonel Scott McLeod, USA**

Project Manager, Soldier Training  
(PM ST)

**0930 - 1000 Colonel Marcus Varnadore, USA**

Project Manager, Synthetic  
Environment (PM SE)

WEDNESDAY 4 DECEMBER • 1600 – 1730

**1600 - 1625 Colonel Corey Hemingway, USA**

Project Manager Cyber, Test, and  
Training (PM CT2)

**1625 - 1650 Dale Whittaker**

International Programs Office (IPO)

**1650 - 1715 Aaron Brown**

Project Lead Training Aids, Devices,  
Simulators, and Simulations  
Support Operations

**1715 - 1730 Mike Harris**

Army Contracting Command-  
Orlando

THURSDAY, 5 DECEMBER  
0830 – 1000  
ROOM S330EF  
PB3

## 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



## 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

### STE Industry Update

Monday, 2 December • 1300 – 1430 • Room S330EF

### Cyber Resiliency and Training

Monday, 2 December • 1500 – 1630 • Room S330EF

### Building the Network to Deliver STE Working Group

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 Working Group

Wednesday, 4 December • 1130 – 1230 • 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 ATTENDEES - INTERNATIONALE TEILNEHMER - LES PARTICIPANTS INTERNATIONAL  
INTERNATIONAL DELTAKERE - INTERNATIONELL DELTAGARE - INTERNATIONAL DEELNEMERS**

**International Pavilion**

**ROOM S310E-H**

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.

**International Pavilion sponsored by Bohemia Interactive Simulations.**

**International Pavilion Hours of Operation**

Monday, 2 December	0800-1800
Tuesday, 3 December	1030-1800
Wednesday, 4 December	0800-1500
Thursday, 5 December	0800-1500

**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)*





## INTERNATIONAL ATTENDEES - INTERNATIONALE TEILNEHMER - LES PARTICIPANTS INTERNATIONAL INTERNATIONAL DELTAKERE - INTERNATIONELL DELTAGARE - INTERNATIONAL DEELNEMERS

### PAPERS / FOCUS EVENT

#### Best from Around the Globe

FE2 • Tuesday, 3 December • 1400 – 1530 • ROOM S320D

(See page 28 for more information)

Come hear the award winners from MODSIM World and ITEC offer their outstanding presentations from two prestigious international conferences.

### COMMUNITY OF INTEREST

#### The European Perspective on Battlelabs and the Role of Simulation

Tuesday, 3 December • 1600 – 1730 • ROOM S329

(See page 40 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 European Voice” of the Modelling, Simulation & 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.

### SIGNATURE EVENT

#### 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 operations and maintenance efforts on the systems, not on the data. 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 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.

### FOCUS EVENT

#### Multinational Perspectives on Live, Virtual and Constructive Implementation in Ops

Wednesday, 4 December • 1400 – 1530 • ROOM S330EF

(See page 35 for more information)

This Special Event will take a Multinational perspective on the planning and operational implementation of LVC in each of the countries. Given the breadth of LVC capabilities being fielded around 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 experiences to date and offer lessons learned that are both common and unique to their applications and their armed forces.

### SIGNATURE SESSION

#### Improving Joint and Multinational Simulation Interoperability

Thursday, 5 December • 0830 – 1000 • ROOM S310AB

(See page 25 for more information)

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 panel participant has a different case study 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.

### FOCUS EVENT

#### New and Emerging Augmentation Technologies for Training and Operations within the NATO Alliance Nations

Thursday, 5 December • 1330 – 1500 • ROOM S310C

(See page 39 for more information)

The NATO HFM-297 (Human Factors and Medicine) Research Task Group (RTG) is a three-year endeavour to review and analyze opportunities for moving new and emerging augmentation technologies from state-of-art to state-of-practice for training and operations within the NATO alliance nations. The goal of this I/ITSEC 2019 Special Event is to assist the RTG in baselining the state of the art and to provide an interactive forum to demonstrate current trends in augmentation technology in the context of human performance. This will involve identifying current and emerging technologies that interact with and stimulate user(s) perceptual systems resulting in higher learning, performance, retention and/or transfer.



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)

1400	Using Artificial Intelligence Technology and Personalized Services for Optimized Dynamic Language Teaching and Learning	Ponddy Education, Inc.
1430	An App-based Approach for Reliably and Efficiently Bringing Users to Fluency in a New Language	Fluent Forever, Inc.

## Tuesday, 3 December – Session 2 (Game Engine Tools)

1600	One World SDK for Unity	SimBlocks LLC
1630	Physically Based Night Vision Goggle Sensor Simulation in Game Engine	Presagis

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

1400	Omni-Directional Treadmill	Infinadeck
1430	The Robot Operating System (ROS) and the Gazebo Simulation Environment	Huntington Ingalls Industries

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

1600	Computer Vision on the Edge	MapBox, Inc.
1630	Disruptive Training Across the Spectrum of Use Cases Using Virtual Immersive Experiences	Enduvo







# 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.

**FOR YOUR CONVENIENCE,  
FOOD STATIONS ARE OPEN  
DURING MONDAY SESSIONS.**



**TUTORIALS**

★ Tutorial from International author(s)

## TUTORIALS SCHEDULE

ROOM	TRACK/CHAIR	0830 – 1000	1245 – 1415	1430 – 1600
S320B	Track1: Cutting Edge Ramona Shires, ND	A Comprehensive Introduction to Medical Simulation (1910)	M&S Case Study Analysis: Design for Additive Manufacturing & 3D Printing (1920)	Location, Location, Location: Big data, Artificial Intelligence and Analytics in the Cloud (1936)
S320C	Track 2: LVC Michael O'Connor	Live, Virtual and Constructive (LVC) Simulation Interoperability 101 (1931)	Distributed LVC Event Integration and Execution Process (1911)	A Functional Approach to Distributed Network Architectures for LVC (1922)
S320D	Track 3: Architectures S.K. Numrich (Sue), Ph.D.	TENA/JMETC: Live-Virtual-Constructive Integration for Test and Training (1928)	Distributed Interactive Simulation (DIS) 101 (1937)	Introduction to HLA (1916)
S320E	Track 4: Think It Through Juliana Slye	Cybersecurity in LVC (1917)	Risk Management Framework: Cyber Security Compliance for Modeling, Simulation and Training Systems (1939)	Simulation Conceptual Modeling Theory and Use Cases (1943)
S320F	Track 5: M&S Fundamentals Mike Freeman	Introduction to DoD Modeling and Simulation (M&S) (1923)	Addressing the Challenges of Rigorous Simulation Validation (1941)	Design of Experiments: Applications for the Simulation Profession (1918)
S320GH	Track 6: Best Tutorials Lee Lacy	An Introduction to Cognitive Systems for Modeling & Simulation (1914)	Artificial Intelligence: Past, Present, Capabilities and Limitations (1919)	Superforecasting: Proven Practices for Leveraging Human Ingenuity (1921)



## TRACK 1: CUTTING EDGE • 0830 - 1000 • ROOM S320B

**A Comprehensive Introduction to Medical Simulation**

(1910)

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 the AdventHealth Nicholson Center and previously served as the CTO for the U.S. Army PEO STRI. He holds a Ph.D. in Computer Science and a Doctorate in Management. He has published 3 textbooks on simulation, 12 book chapters, and over 100 journal papers. His most recent book is *A CTO Thinks About Innovation*.

**DANIELLE JULIAN, M.S.**, is a Senior Research Scientist at AdventHealth’s Nicholson Center. Her current research focuses on robotic surgery simulation and effective surgeon training. She is currently a Ph.D. student in Modeling and Simulation at the University of Central Florida where she previously earned an M.S. in Modeling and Simulation and a B.S. in Psychology.

## TRACK 2: LVC • 0830 - 1000 • ROOM S320C

**Live, Virtual and Constructive (LVC) Simulation Interoperability 101**

(1931)

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**

**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 environments 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.





## TRACK 3: ARCHITECTURES • 0830 - 1000 • ROOM S320D

**TENA/JMETC: Live-Virtual-Constructive Integration for Test and Training**

(1928)

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.

**Presenter**

**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.

## TRACK 4: THINK IT THROUGH • 0830 - 1000 • ROOM S320E

**Cybersecurity in LVC**

(1917)

Cyber adversaries have a vast array of tools and a keen sense of when to use each one for maximum effect. You may not be able to stop all attacks but, you can minimize risk and impact of threats by constraining adversaries' operational space. Given LVC's inherently connected nature and the increasing dependence on commercial technologies, cybersecurity is critical to training and simulation. The objective is to reduce any adversary's ability to operate in your environment. Network flow data provides a wealth of behavioral information useful in understanding operations and detecting abnormalities. Detailed flow information can enable pervasive visibility and effective cybersecurity from the endpoint, through the network, to the data center and to the cloud. An effective cybersecurity architecture will provide early warning to help get inside the attacker's timeline and then it will help block attacks to prevent damage, compromise, loss of information, or even operational and safety risks. It's also important to close the vulnerability and ensure that your system learns from the attack and strengthens defenses after an attack. The ability to collect flow data and contextual information about users, applications and devices enables the network to serve as a powerful security resource. Coupled with accurate and timely threat intelligence, new technology and techniques allow today's network infrastructure to leverage embedded security capabilities to enable the entire network, and even the data center, to serve as an invaluable security resource. Integration and communication between network control and security are absolutely essential.

**Presenters**

**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 and 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 cybersecurity training for the warfighters.



## TRACK 5: M&amp;S FUNDAMENTALS • 0830 - 1000 • ROOM S320F

**Introduction to DoD Modeling and Simulation (M&S)**

(1923)

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 warfighting capabilities, threat capabilities, cyber, natural environment, complex systems, and human/organizational behavior. The attendee will become familiar with how M&S is used in the DoD for operational purposes - especially training and other areas of direct warfighter 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.

## TRACK 6: BEST TUTORIALS • 0830 - 1000 • ROOM S320GH

**An Introduction to Cognitive Systems for Modeling & Simulation**

(1914)

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 at 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. Schmorrows 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.



## TRACK 1: CUTTING EDGE • 1245 - 1400 • ROOM S320B

**M&S Case Study Analysis: Design for Additive Manufacturing & 3D Printing**

(1920)

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).

## TRACK 2: LVC • 1245 - 1400 • ROOM S320C

**Distributed LVC Event Integration and Execution Process**

(1911)

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 (DSEEP) 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 DSEEP 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 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 DSEEP 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.





## TRACK 3: ARCHITECTURES • 1245 - 1400 • ROOM S320D

**Distributed Interactive Simulation (DIS) 101**

(1937)

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)

## TRACK 4: THINK IT THROUGH • 1245 - 1400 • ROOM S320E

**Risk Management Framework: Cyber Security Compliance for Modeling, Simulation and Training Systems**

(1939)

Cybersecurity, it is everywhere we look in today's world and when it comes to government systems it can seem like an extremely broad topic which evokes the fear of insurmountable regulations that ultimately provide little benefit. This tutorial aims to break the stigma surrounding Cybersecurity compliance as nothing more than a burdening nuisance and leave the audience with an understanding of the ultimate goals of the Risk Management Framework (RMF) and how it was designed to relieve excessive regulation and costs. The primary goal of Cybersecurity RMF compliance is to ensure the confidentiality, integrity and availability of government run systems, software, and data are upheld, enabling those systems to remain operational and available to support military missions. Such missions include simulation and training environments which are becoming increasingly more important to protect as the concept of force readiness becomes a priority for the world's militaries. This tutorial will focus on understanding the requirements for the Cybersecurity Risk Management Framework (RMF) and how it applies to modeling, simulation, and training systems. We will detail the need for Cybersecurity compliance, the key concepts, and why it is critical for military, government, and even civilian applications. The tutorial will then dive deeply into the regulations behind RMF and the certifications required for compliance. This will include where to find additional information and how to achieve those certifications, from both a government and contractor perspective. The tutorial will then explain the general process of approaching RMF compliance and how the Cybersecurity implementation plans are created and revised in the requirements gathering phase. Using these RMF requirements and concepts, the tutorial will then take it a step further and analyze the documentation deliverables associated with RMF, their purposes, and finally the government processes necessary to submit a system for an Authority-to-Operate decision. Attendees will gain a strong foundational understanding of the Cybersecurity Risk Management Framework and how to apply it in their own programs.

**Presenters**

**DONALD LAWSON** is Cybernet's Vice President of Cybersecurity and Training Systems with over 15 years of combined experience in software engineering, system integration/development, and cybersecurity compliance. He has a Bachelor's degree in Computer Science from the University of Central Florida along with a CISSP and Security+ certification. He has been instrumental in obtaining numerous Modeling, Simulation, & Training device Authority-to-Operate designations across most branches of the U.S. military and continues to propel the current state of cybersecurity accreditation forward by embracing the NIST Risk Management Framework (RMF) and the supporting technologies and processes required to successfully implement it.

**CHARLES COHEN** is Cybernet's Chief Technology Officer, and has been a technical lead and project manager in the fields of modeling and simulation, cybersecurity, image processing, sensors, robotics, human-computer interaction, and artificial intelligence for over a decade. At Cybernet, he has led projects for the U.S. DoD, NASA, Homeland Security, and other government agencies. His projects include work on simulation, training, visual surveillance, real-time optical pose determination, robotics, virtual reality, object identification, feature and body tracking, and human performance evaluation. He also currently serves on the I/ITSEC Tutorial Board. He has served for years as a member of the Simulation Interoperability Standards Organization, which facilitates interoperability across live, virtual, and constructive environments. He holds a Ph.D. in Electrical Engineering Systems from the University of Michigan.



## TRACK 5: M&amp;S FUNDAMENTALS • 1245 - 1400 • ROOM S320F

**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 VV&A focal point for the past 25 years. Ms. Youngblood was the editor of the DoD VV&A Recommended Practices Guide and chaired the development of several VV&A 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 Materiel 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.

## TRACK 6: BEST TUTORIALS • 1245 - 1400 • ROOM S320GH

**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 is a retired Army officer with degrees in Mathematics and Computer Science (artificial intelligence). His final 10-year assignment of Army active duty was as an Academy Professor of Computer Science and Director of the Office of Artificial Intelligence Analysis and Evaluation at the United States Military Academy, West Point. He has over 20 years of M&S experience including service as chair of the I/ITSEC Tutorial Board, the I/ITSEC Simulation Subcommittee, the I/ITSEC Fellows Committee, and multiple SISO leadership positions.

**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 autonomy 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.





## TRACK 1: CUTTING EDGE • 1430 - 1600 • ROOM S320B

**Location, Location, Location:  
Big data, Artificial Intelligence  
and Analytics in the Cloud**

(1936)

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 tool 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 of 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.

## TRACK 2: LVC • 1430 - 1600 • ROOM S320C

**A Functional Approach to Distributed  
Network Architectures for LVC**

(1922)

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, assuring 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

(1916)

## Simulation Conceptual Modeling Theory and Use Cases

(1943)

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 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.



## TRACK 5: M&amp;S FUNDAMENTALS • 1430 - 1600 • ROOM S320E

**Design of Experiments: Applications for the Simulation Profession**

(1918)

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.

## TRACK 6: BEST TUTORIALS • 1430 - 1600 • ROOM S320GH

**Superforecasting: Proven Practices for Leveraging Human Ingenuity**

(1921)

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 ECIT. 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.



ROOM	SESSION/CHAIR	1400	1430	1500
S320A	EC1 <b>Cyber: Build Once, Reuse Often</b> Scott Schutzmeister	A Cyberspace Electromagnetic Activities (CEMA) Framework for M&S (19193)	A Roadmap to Achieve Cyber Modeling & Simulation Interoperability (19314)	Simulate Effects of Cyberspace Electromagnetic Activities (CEMA) in Mission Command Systems (19257)
S320B	S1 <b>Simulation Architectures</b> Peter Swan	Assessing and Measuring Interoperability Between Multi-national Live Training Systems (19186)	Towards a Common Reference Architecture for Mission Training Through Distributed Simulation (19225) ✈	New Techniques for High-Fidelity Modeling and Simulation in 5G Mobile Network Environments (19322)
S320C	P1 <b>Collaboration: It Takes Two to Tango</b> Doug Parsons	A Tale of Two T's: Enabling Testing Through Reuse of Training Services (19356)	Raising The Standard – Industry And Government Working Together for Simulation Coherence (19187) ✈	With Uncertainty Comes Opportunity: Solving the DoD's Flash Problem (19305)
S320D	BP3 <b>Best from Around the Globe</b> Amanda Davies, Ph.D.	MODSIM World Best Paper: Simulation-Based Training's Incorporation of Machine Learning ✈	ITEC Best Paper: Making The Invisible Visible: Increasing Pilot Training Effectiveness By Visualizing Scan Patterns of Trainees Through AR ✈	
S320E	H1 <b>There's Reality and There's Virtual Reality</b> Scott Johnston	Optimizing Haptics within AR/VR Training Given Human Sensory Capabilities (19336)	Simulations to Train Buried Explosives Detection: A Pilot Investigation (19134)	Effects of Transparency Level, Controller Type and Visual Degradation on Performance Using Augmented Reality and Synthetic Vision (19272)
S320F	T1 <b>Enhanced Add-ons: Stories and Games</b> Robert Wallace	Game-based Learning to Enhance Post-secondary Engineering Training Effectiveness (19139)	Revolutionizing Formal School Learning with Adaptive Training (19215)	Game On: Storytelling Narrative Applied to Simulator-based Training (19363)

ROOM	SESSION/CHAIR	1600	1630	1700
S320A	EC2 <b>Learning Building Blocks</b> Tim Woodard	Building The World - Could AI Build Our Synthetic Environments? (19180)	Reinforcement Learning for Computer Generated Forces Using Open-Source Software (19197) ✈	Use of Natural Language Processing to Extract Technical Competency Frameworks from Maintenance Task Analyses (19255)
S320B	S2 <b>Synthetic Terrain Environments</b> Nina Deibler	Enhancing Situational Awareness Anywhere in the World with Geospatially Accurate Scene Simulation Using Automated "Real World" Content Generation (19112)	Reconfiguring Synthetic Environments as Inputs to Unity 3D (19277) ✈	Geospecific 3D Terrain Data Optimization Solutions for Game and Simulation Engines (19368)
S320C	P2 <b>What's Up in the Joint Integrated Training Environment</b> Steve Parrish	Overview of USMC Modeling and Simulation Office Policy Lessons Learned (19132)	Air Force Methodology for Overarching Joint Training Policy for Joint Interoperability (19262) ✈	Live-Virtual-Constructive Training Environment Analysis of Alternatives Lessons Learned (19135)



ROOM	SESSION/CHAIR	0830	0900	0930
S320A	EC3 <b>Virtual Care Is Real</b> M. Beth Pettitt	Toward the Development of a Medical Simulation Training Architecture (MSTA) (19219)	Development and Demonstration of Augmented Reality Forward Surgical Care (19301)	The Application of Augmented Reality for Immersive TC3 Training (19379)
S320B	S3 <b>Autonomy in Simulation</b> Michael Natali	Controlling Computer-Generated Lifeforms Using Fuzzy State Machine (19126)	Simulation and Sensitivity Analysis of Mobile Proximity Stopping Distance in Unity (19152)	Simulation-based Autonomous Systems Testing – from Automotive to Defence (19166) ✈
S320C	P3 <b>Measure Twice, Execute Once</b> Marty Bink, Ph.D.	Ensuring Psychometric Validity Within an Automated Performance Measurement Standard (19170)	Measuring the Impacts of Transitioned Solutions (19234)	When Time Matters, Assessment Only and the Risk Management Framework (19118)
S320D	ED1 <b>Instruction; Reconstruction</b> 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)
S320E	H2 <b>Don't Forget Your Towel: The Hitchhiker's Guide to Cognition</b> Gordon Gattie	Cognitive Expertise through Repetition Enhanced Simulation (CERES): Learning to Understand Topographic Maps (19258)	Cognitive Skill Assessment in a Virtual Environment (19323)	Real-Time Measurement of Team Cognitive Load during Simulation-based Training (19129)

ROOM	SESSION/CHAIR	1030	1100	1130
S320A	EC4 <b>See Me, Hear Me, Touch Me</b> John Burwell	Human-like Auditory Capability for Intelligent Virtual Agents (19125)	Mid-air Haptics in Aviation (19184) ✈	Utilizing Augmented Reality for Air Force Maintenance Training (19329)
S320B	S4 <b>Adapting the Simulation Toolbox</b> 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 <b>Big Data</b> 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 <b>Transforming Military Learning</b> 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) ✈
S320F	T2 <b>Tag You're It: Team Training &amp; Oversight</b> Sean Carey	Enhancing Training of Supervisory Control Skills for Automated Systems (19120)	The Development and Implementation of Speech Understanding for Medical Handoff Training (19235)	Training Teamwork Skills in an Intelligent Tutoring System (19276)
S320GH	BP1 <b>Best Papers</b> 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)



ROOM	SESSION/CHAIR	1400	1430	1500
S320A	EC5 <b>Perception Is Reality</b> Harry Sotomayor	Augmenting Cyber Assessment through Dynamic Malware Analysis (19249)	Visualizing Electromagnetic Spectrum Phenomena in Augmented Reality (19298)	
S320B	S5 <b>Engineering Simulation Solutions</b> Christina Bouwens, Ph.D.	Aimpoint Solutions on Complex Area Targets (19172)	Cyber Model-based Engineering (MBE) (19254)	Enhancing Wargaming Fidelity with Network Digital Twins (19269)
S320C	P5 <b>Emerging Approaches for Simulation In Acquisition</b> James Dennis	Using Design of Experiments to Improve Analyses, Simulations and Cost (19104)	A New Approach to Building Agile Simulations (19157)	Model Based Systems Engineering for Acquiring Vehicle Training Simulations (19221)
S320D	ED3 <b>Evaluation of XR Tools</b> Aaron Judy, Ed.D.	Increasing XR Technology's Return on Investment Through Media Analysis (19327) ✈	Air University Multi-modal Research Course on VR/AR and Related Technologies (19388)	Evaluation of sUAS Education and Training Tools (19136) ✈
S320F	T3 <b>Training, Accelerated</b> Nick Giannias	Simple to Complex – Evolution of Workforce Training in a Rapidly Changing Environment (19155)	Improving Assessments Using Intelligent Agents with Transient Emotional States (19251) ✈	Learning Next: Self-Improving Competency-based Training Rooted in Analytics (19302)
S320GH	BP2 <b>Best Papers</b> Jeremy Lanman, Ph.D.	PSMA – Effects of Bottlenecks within Military Training Pipelines (19145) ✈	Training – Advise When Ready for Game Plan: Adaptive Training for JTACs (19105)	Simulation – Fully Automated Photogrammetric Data Segmentation and Object Information Extraction Approach for Creating Simulation Terrain (19245) ✈

ROOM	SESSION/CHAIR	1600	1630	1700
S320A	EC6 <b>AI in the Kill Chain</b> Marcus Boyd	The Value of Cognitive Workload in Machine Learning Predictive Analytics (19147)	Emerging Innovations for Next Generation Mission Planning and Debrief (19253)	Man-Machine Interoperation in Training for Large Force Exercise Air Missions (19372)
S320B	S6 <b>Improving Computer Generated Forces</b> Jimmy Moore, CMSP	Demonstrating the Effects of Human Behavior in Simulation Using the RAND Will to Fight Model (19111)	Reusability and Efficiency in Behaviour Modelling for Computer Generated Forces (19211) ✈	Exploring Game Industry Technological Solutions to Simulate Large-scale Autonomous Entities within a Virtual Battlespace (19328) ✈
S320C	P6 <b>Acquisition: Streamlining Standards and New Approaches</b> Michelle Wright	Government - Industry Collaboration: Essential to Training Evolution and Relevancy (19347)	Application of the M&S Community of Interest Discovery Metadata Specification to Standards Profiles for Acquisition and Air Force Training (19270)	Tailoring Acquisition to Deliver at the Speed of Commercial Industry (19315)
S320D	ED4 <b>Tools for M&amp;S Educators</b> Anastacia MacAllister, Ph.D.	Track Mobile Learning with Secure Access Using xAPI and CAC (19102)	Conducting Training and Simulation Research: A Primer for Practitioners (19179) ✈	Neuro-Designer: Informing the Development of Learning Solutions Through Application of Neuro Metrics (19266)

ROOM	SESSION/CHAIR	0830	0900	0930
S320A	EC7 <b>Emerging Models for Training Value and Infrastructure</b> Gordon King	The Foothold in the War of Cognition: The Operational Training Infrastructure Enterprise System Model (19226)	Towards a Rationalization and Valuation Methodology for Training & Simulation Capabilities (19292) ✖	LVC-Enabled Range Technology: Supporting Training for Next-Gen Weapons Systems (19332)
S320B	S7 <b>Advancing Virtual Reality and Training</b> Kenny Hebert	Designing Virtual Reality Tools: Making Simulated Interventions Feel and Act Like Their Real Counterparts (19190) ✖	Toolset 3D Position Tracking for a Visio-Haptic Mixed Reality System (19279) ✖	Utilizing Commodity Virtual Reality Devices for Multi-user Training Simulations (19262)
S320C	P7 <b>Novel Applications: Back to the Future</b> Janet Weisenford	A Proposal Standard for Distributed Aerial Refueling with Probe-and-Drogue System (19127)	Medical Simulation for the Future of the Joint Training Community (19385)	The Flying Car – Emergent Modeling & Simulation (M&S) Policies and Standards Concerns (19140) ✖
S320E	H3 <b>What Gets Measured, Gets Done</b> Perry McDowell	Situational Awareness Measuring Method In Simulated Combat – A Case Study (19153) ✖	Developing a Scaled Performance Evaluation Measurement System (19133)	Rethinking Effectiveness Evaluations: Measuring the Effectiveness of a Mobile Performance Support Application Using xAPI (19162)

ROOM	SESSION/CHAIR	1030	1100	1130
S320A	EC8 <b>Lean Mean Learning Machine</b> Kendy Vierling, Ph.D.	Persistent Machine Learning for Government Applications (19160)	Approaches for Deep Learning in Data Sparse Environments (19333)	Lean Scenes: Variable-fidelity Models Reduce Machine-learning Training Requirements (19349)
S320B	S8 <b>Wargaming and Planning</b> John Huddleston, Ph.D.	Wargaming Evolved: Methodology and Best Practices for Simulation-Supported Wargaming (19182) ✖	Supporting Military Planning with Simulation (19212) ✖	Using LVC Technology for the Military Planning Process (19290)
S320C	P8 <b>Concepts In Agility and Risk</b> Jeremiah Folsom-Kovarik, Ph.D.	Executive Risk Assessments for the Age of Algorithms (19110)	Air Force Agile Development Methodology for Addressing Future Air Operations Capabilities (19268) ✖	Requirements Engineering Innovations for Agile-based Programs (19247)
S320D	ED5 <b>21st Century Learning</b> Sae Schatz, Ph.D.	Cognitive Weaponry: Optimizing the Mind (19380)	Establishing Engaged Social Learning Communities: Formation and Sense Making (19326) ✖	Transforming the Operational Mindset: Self-regulating Cognitive Performance Enhancement Strategies (19310)
S320E	H4 <b>Human Performance Pot Pie</b> Aerial Kreiner, Ph.D.	Psychomotor Skills Assessment via Human Experts, Simulators and Artificial Intelligence (19108)	"#CGHowTo" – "Help Right Now" for Coast Guardsmen in the Field (19203)	Wearable Stress Monitoring During Live Training (19237)
S320F	T4 <b>Improving Training through Realistic Environments and Architectures</b> Thomas Yanoschik, CMSP	Impact of Malodors on Tourniquet Application: A Longitudinal Study (19169)	Driving Digitally-aided Close Air Support Capabilities in Simulation: Lessons Learned (19320)	Adaptive Network Planning for Infrastructure Networks for Test and Training Events (19337)

ROOM	SESSION/CHAIR	1330	1400	1430
S320A	EC9 <b>New Thinking About How Machines "Think"</b> Byron Harder, Ph.D.	Adaptive Nonconvex Optimization for Artificial Intelligence, Machine Learning and Quantum Computing (19109)	Interpretable Network Architectures for Machine Learning (19149)	Prognostic Health Management Using Semi-supervised Machine Learning (19164)
S320B	S9 <b>Radio Frequencies</b> Nina Deibler	Jamming Techniques 2.0 (19224)	Radio Network Automation for Operational Testing: A Practical Resource for Radio Networks Planning (19366)	
S320D	ED6 <b>Start Making Sense: Strengthening Interpersonal Communication</b> Annette Robinson	Communication Skills Development for Non-Commissioned Officers (NCOs) (19293)	LEGO Serious Play: A Powerful Sense-Making Tool in Military Contexts (19267)	



## Best Papers

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, PeopleTec, 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 (19343)

John Graybeal, Ph.D., Todd Du Bosq, U.S. Army CCDC C5ISR Center Night Vision and Electronic Sensors Directorate; Rachel Nguyen, KINEX, Inc.

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 Steinhäuser, NAWCTSD; Daphne Whitmer, Zenetex, LLC; Adam Clement, EWTGPAC N75C

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

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

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

## Emerging Concepts & Innovative Technologies

EC1 TUESDAY • 3 DECEMBER • 1400 • ROOM S320A

### Cyber: Build Once, Reuse Often

**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 Heidelberg, Trideum Corporation; Nathan Vey, U.S. Army CCDC-SC; Chad Bates LTC, 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

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

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



PAPERS

**EC4 WEDNESDAY • 4 DECEMBER • 1030 • ROOM S320A****See Me, Hear Me, Touch Me****Session Chair:** John Burwell, Varjo Technologies**Session Deputy:** Joseph Mercado, NAWCTSD**Human-liked 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

**EC5 WEDNESDAY • 4 DECEMBER • 1400 • ROOM S320A****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, Kyuhong Park, Carter Yagemann, Georgia Tech

**Visualizing Electromagnetic Spectrum Phenomena in Augmented Reality (19298)**

Michael Longtin, Robert Hernandez, Richard Schaffer, sMark Wager, Lockheed Martin

**EC6 WEDNESDAY • 4 DECEMBER • 1600 • ROOM S320A****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 Interoperation in Training for Large Force Exercise Air Missions (19372)**

Patrick Craven, Ph.D., Kevin Oden, Kevin Landers, Lockheed Martin; Ankit Shah, Julie Shah, MIT CSAIL

**EC7 THURSDAY • 5 DECEMBER • 0830 • ROOM S320A****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

**EC8 THURSDAY • 5 DECEMBER • 1030 • ROOM S320A****Lean Mean Learning Machine****Session Chair:** Kendy Vierling, Ph.D., USMC, TECOM / Future Learning Group**Session Deputy:** Randal Allen, Ph.D., CMSP, Lone Star Analysis**Persistent Machine Learning for Government Applications (19160)**

Joshua Haley, Chad Dettmering, Ryan Barrett, Ali Mizan, Brian Stensrud, Alyssa Tanaka, Ross Hoehn, Soar Technology

**Approaches for Deep Learning in Data Sparse Environments (19333)**

Joshua Haley, Richard Pazda, Jeremiah Folsom-Kovarik, Brian Stensrud, Ross Hoehn, Robert Wray, Soar Technology

**Lean Scenes: Variable-fidelity Models Reduce Machine-learning Training Requirements (19349)**

Blake Anderton, Ph.D., Torch Technologies

**EC9 THURSDAY • 5 DECEMBER • 1330 • ROOM S320A****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 Belknap, Danielle Clement, Ph.D., Stephen Summers, Lockheed Martin Corporation

**Education****ED1 WEDNESDAY • 4 DECEMBER • 0830 • ROOM S320D****Instruction; Reconstruction****Session Chair:** Bill Gerber, Ph.D., Institute for Defense Analyses (IDA)**Session Deputy:** Colleen Matthews, U.S. Army PEO STRI**Implementation of a “True” Flipped Classroom Concept at the Norwegian Defense University College (19116) ✈**

Geir Isaksen, Norwegian Defense University College / Advanced Distributed Learning Office

**Avoiding Pitfalls in Undergraduate Simulation Courses (19168)**

Vikram Mittal, Gene Lesinski, Matthew Dabkowski, United States Military Academy

**An Evidence-Based Methodology for Evaluating the Community Impacts of a Science, Technology, Engineering and Mathematics (STEM) Instructional Program (19220)**

Jessica Cortez, Ph.D., Cubic Corporation; John Kegley, Aptima; Wink Bennett, Airman Systems Directorate, Warfighter Readiness Research Division



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

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

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

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

ED6 THURSDAY • 5 DECEMBER • 1330 • ROOM S320D

### Start Making Sense: Strengthening Interpersonal Communication

**Session Chair:** Annette Robinson, Magic Leap Horizons

**Session Deputy:** Alysso Hursey, SAIC

**Communication Skills Development for Non-Commissioned Officers (NCOs) (19293)**

Kara Orvis, Jessica Shenberger-Trujillo, Kristy Kay, Krista Ratwani, 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

### 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 Grabowecy, 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, NAWCTSD; 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:** Jenifer 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, NAWCTSD; 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, NAWCTSD

**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, NAWCTSD

**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, NAWCTSD

**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/MSISRP, 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 Roemerma, 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 Feteck, 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



S3 WEDNESDAY • 4 DECEMBER • 0830 • ROOM S320B

**Autonomy in Simulation****Session Chair:** Michael Natali, CNATRA**Session Deputy:** Edward Degnan, Ph.D., USAF AFAMS**Controlling 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 CDC-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, Haci Yuksel, Havelsan; Yigit Tascioglu, Tobb University of Economics &amp; 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 Halsør, 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 &amp; 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 Sheatzley, 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 Reinerman-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&amp;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&amp;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 onsite) 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 equate to one CEU credit.

**Contact Jana Breburdova at [jana.breburdova@ucf.edu](mailto:jana.breburdova@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](http://SimProfessional.org) or contact Carol Dwyer at [cdwyer@NDIA.org](mailto:cdwyer@NDIA.org)**







## Friday — Professional Development Workshops

Location:	Orange County Convention Center, South Concourse, Rooms S330 A-H 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 — <b>seating is limited</b> . 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 <a href="http://www.iitsec.org/attend/registration-fees">http://www.iitsec.org/attend/registration-fees</a>
Lunch:	On own



### Division of Continuing Education

UNIVERSITY OF CENTRAL FLORIDA

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UCF Division of Continuing Education • 3280 Progress Drive, Suite 700, Orlando, FL 32826 • (407) 882-0260 or [ceprograms@ucf.edu](mailto:ceprograms@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).

PDW1.1 • Room S330EF • 0800 – 1130

### Cyberspace Training: Is This Even Legal?

**Presenters** David “Fuzzy” Wells, Ph.D., CMSP, Deputy Director, Institute for Simulation and Training, University of Central Florida; Derek Bryan, Support Contractor for the U.S. Pacific Command Cyber War Innovation Center

Although mandated at the highest levels of government, cyberspace training remains a largely undocumented and misunderstood training domain. Who are we training? How can we ensure that cyberspace training events do not negatively impact the rest of the training audience? What cyberspace training capabilities exist and how can we best integrate and employ them? Where can I get help? This workshop provides answers to the above questions including defining your training audience and objectives, identifying supportive programs, venues and processes and detailing and demonstrating the plethora of available cyberspace training solutions. It provides a foundation to help organizations define, plan and execute cyberspace training events and will aid individuals – leaders, planners, cyber warriors, service providers and general users – who provide or rely on cyberspace capabilities to accomplish their mission.

#### Workshop Schedule:

0800 – 0845	Plenary Session	1130 – 1300	Lunch, Student Posters, and Demos
0845 – 0900	Networking Break	1300 – 1530	Break-out Sessions Cyber Strategy and Policy Human Aspects of Cybersecurity (HACS) Integrating Women & Underrepresented Communities into the Cyber Workforce
0900 – 1130	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



## Blockchain, Cyber Security, and Simulation

**Presenter** David Metcalf, Ph.D., Director, Mixed Emerging Technology Lab, UCF Institute for Simulation and Training

Come explore the latest examples and ideas of Blockchain's potential to reshape training and simulation. The power of Blockchain goes beyond cryptocurrencies to unlock the potential for combining technologies that reshape industries. Whether AI, IoT, games, or smart contracts, understanding how these technologies may disrupt traditional industry, academic and government solutions is essential. In this session, you will get an overview, followed by industry specific examples in games/sims, health and enterprise systems as well as a proven framework for evaluating the potential for Blockchain and emerging technologies.

PDW2 • Room S331A • 0800 – 1200

## 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

PDW3 • Room S331B • 0800 – 1200

## 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.

PDW4 • Room S331C • 0800 – 1200

## 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.

PDW5 • Room S331D • 0800 – 1200

## 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 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 Huddleston, 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 exam-

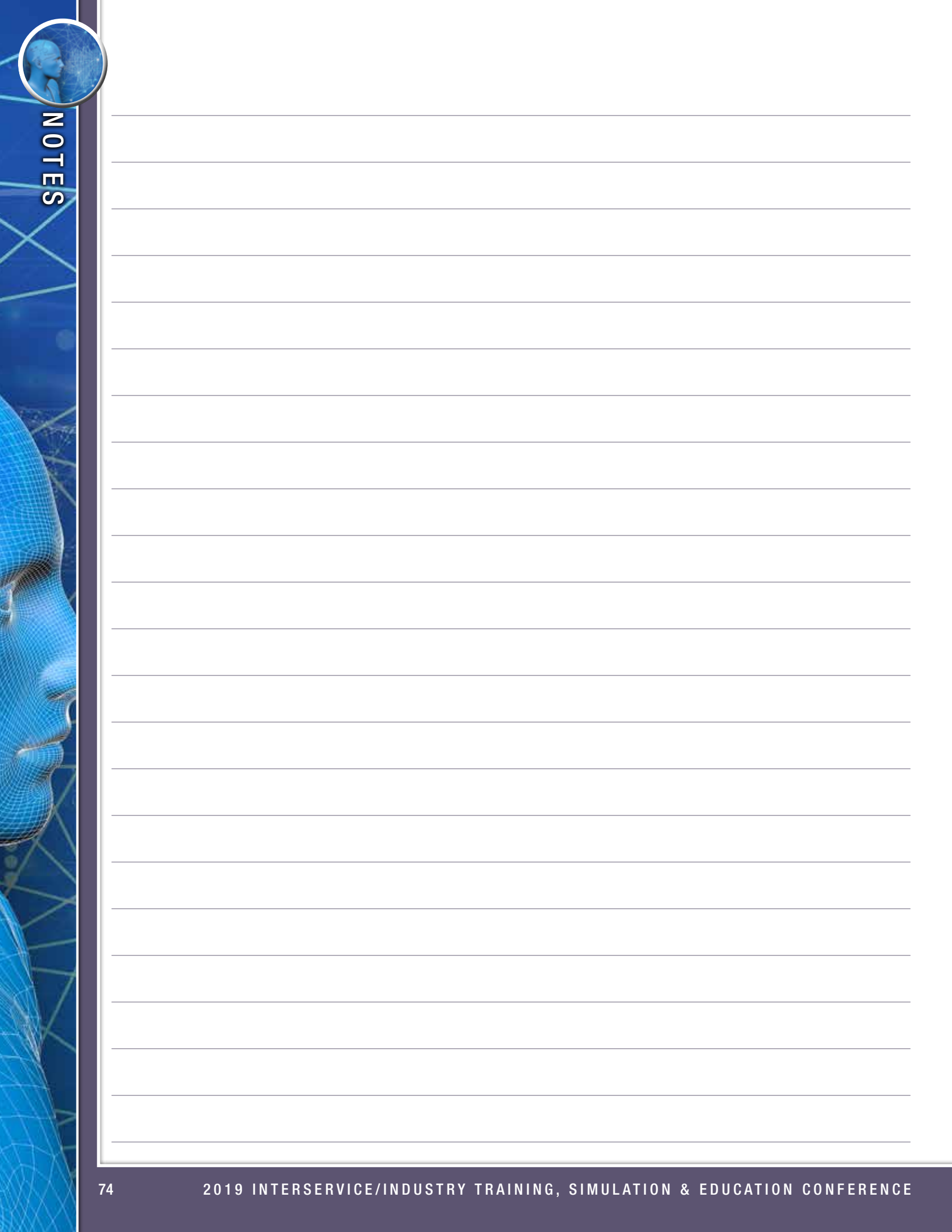
ples form the underpinning research. The workshop will reflect the latest enhancements to the methodology developed in 2018/19. The iterative application of TCTNA to support key stages in the acquisition process will also be discussed. The workshop will include short elements of presentation, group discussions 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.

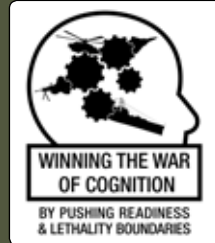








# STEM





# Workforce Initiative



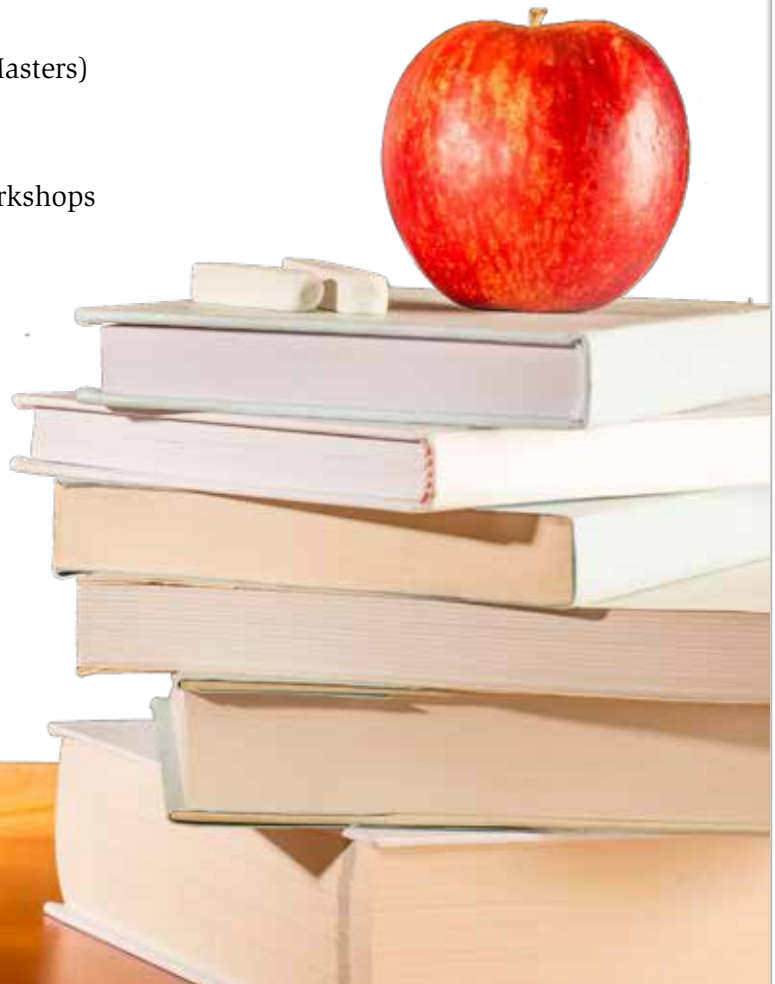
STEM supports and promotes activities encouraging students' interest and pursuit in Science, Technology, Engineering and Mathematics.

## 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



STOP!  
SEE THE FUTURE

## Future Leaders Pavilion

Booth  
2980



**Tuesday, 3 December**

1200 – 1730

**Wednesday, 4 December**

0930 – 1730

PRESENTATION SESSION

1600 – 1730

ROOM 320F

**Thursday, 5 December**

0930 – 1500

AWARDS CEREMONY

1415 • BOOTH 2588

Innovation Showcase

## *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 first-hand, 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](mailto:roto@r-squaredsolutions.net) or [renita.ketchen@technologytap.com](mailto: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.



# SERIOUS GAMES

## SHOWCASE & CHALLENGE

Great excitement awaits you in Booth #2880 at the 14<sup>th</sup> 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 5<sup>th</sup> 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 4<sup>th</sup>!

***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](mailto:jmcnamara@breakawayltd.com)

### 7 Awards!

**Students' Choice**  
**Innovation**  
**Business**  
**Student**  
**Government**  
**XR (AR/VR/MR)**  
**People's Choice**



sgschallenge



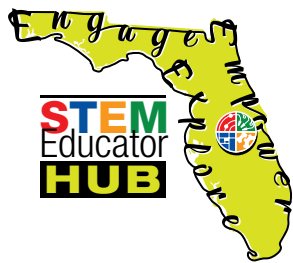
@sgschallenge

[sgschallenge.com](http://sgschallenge.com)

**Booth #2880**







[www.centralfloridaSTEM.org](http://www.centralfloridaSTEM.org)



# STEM Tomorrow's Workforce, Today!

STEM Pavilion: Near the Exhibit Hall Lunch Entrance  
Project-based Learning Exhibitors



STEM PAVILION: PROJECT-BASED LEARNING

## 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.



Visit [www.centralfloridaSTEM.org/parents](http://www.centralfloridaSTEM.org/parents)  
for more Parent resources



Visit [www.centralfloridaSTEM.org/student](http://www.centralfloridaSTEM.org/student)  
for more Student resources

## Teacher Workshop

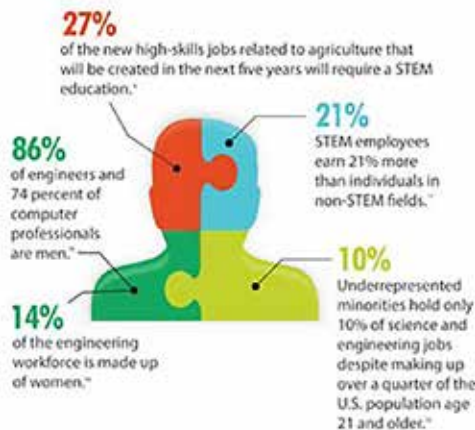
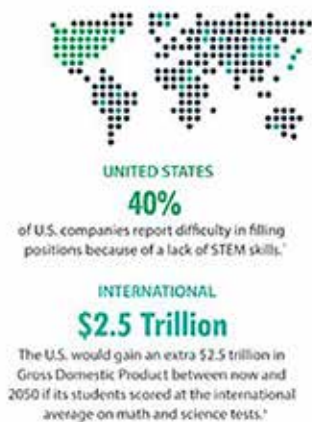
The annual I/ITSEC Teacher Workshop gives teachers a chance to be students and engages teachers in hands-on learning by letting them try new ideas for their classroom. It facilitates dialogue between project-based learning (PBL) and industry professionals, while providing a set of relevant and accessible 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/educators](http://www.centralfloridaSTEM.org/educators)  
for more Educator resources



## The State of America's Workforce



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.



**Sara Beadle**  
Clemson University  
Human Factors Psychology



**Alexandra Kaplan**  
University of Central Florida  
Human Factors & Cognitive Psychology



**Julie Kent**  
University of Central Florida  
Modeling & Simulation



**Adam Kohl**  
Iowa State University,  
Mechanical Engineering & HCI



**Lee Lisle**  
Virginia Tech  
Computer Science



**Jack Miller**  
Iowa State University  
Mechanical Engineering



**Emily Rickel**  
Embry-Riddle University  
Human Factors



**Mark Schiferle**  
SUNY Buffalo  
Mechanical Engineering

### *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

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



**Elisa Torres**  
George Mason University  
I/O Psychology



**Morgan McCombs**  
Massachusetts Institute of Technology  
Computation for Design and Optimization

**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](http://www.iitsec.org).

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

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

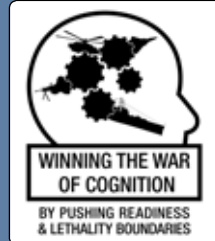
**Direct Further Inquiries and Provide Submissions**  
I/ITSEC Scholarship Program  
c/o The National Training and Simulation Association  
2101 Wilson Boulevard, Suite 700  
Arlington, VA 22201  
(703) 247-9480 or [dlangelier@ndia.org](mailto:dlangelier@ndia.org)

**Scholarship Chair**  
Janet Spruill, Aptima, Inc.

Over \$500,000 in scholarship awards distributed to date



# Exhibit Hall





### 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

PEO STRI	339/1533
PM TRASYS	1433
NAWCTSD	249/1439
USAF	1539
U.S. Army CCDC	329

### International Pavilions

Canada	1871
Australia	2360

### Healthcare Pavilion

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



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)

<b>Monday, 2 December • International Spotlight</b>		
1430	Full-Body Multiplayer VR by Manus	Manus VR
1445	3D Content and Geographic Visual Database Creation for Training and Simulation Systems	B-Design3D Ltd.
1500	Unique Light Field Displays for Natural 3D Visualization	Avalon Holographics
1515	An Alternative to Enforcing “Common” Standards in Modeling: Publishing Interoperability and Promoting Functionality	SIMTHETIQ Inc.
1530	Training Management System – The Missing Link	BNH Expert Software Inc.
1600	Impact of Virtual Reality on Enterprise Training	inlusion Netforms UAB
1615	Optical Blending for projection display – maximise your Dynamic range; from NVG to daylight	Gbvi
1630	New Electronic Blanks, E-blanks by GREEN AMMO	Green Ammo AS
1645	Human Eye Resolution in AR and VR for Simulation and Training	Varjo Technologies
1700	C4ISR: Reducing Cognitive Load in Mission Planning with True 3D Image Visualization	3D Planeta
1715	Futures Technology Forecasting in Action	Noetic Group
1730	IT <sup>2</sup> EC 2020: Are you ready for your Digital Twin?	IT <sup>2</sup> EC
<b>Tuesday, 3 December</b>		
1245	Chiron-X1™ Armor and Close-Quarter Combat Training and XR Simulation	Chiron Global Technologies / Kinetic XR
1330	Improve Efficiency with Training Life Cycle	BNH Expert Software Inc.
1415	Agile Learning for a Competitive Edge	Deloitte
1500	Google Cloud Presentation by Christian Burbach	Google Cloud
1545	Remote Light Source and Projector Head: Making 8K Resolution and High Frame Rate More Compact	Digital Projection
1630	Unique Light Field Displays for Natural 3D Visualization	Avalon Holographics
<b>Wednesday, 4 December</b>		
0930	MAK One in STE	VT MAK
1015	Simulation Configuration and Environment Control (SimChEC)	Trideum Corporation
1100	Futures Technology Forecasting in Action	Noetic Solutions
1145	Using Virtual Environments for Real-world Autonomous Vehicle Training	ForgetFX Simulations
1230	Advanced Mission Training for Global Border Security Screening Solutions	S2 University
1315	Future of Digital Learning	Adobe, Inc.
1400	Cyber Table Top (CTI)	Trideum Corporation
1445	“Stop Prescribing Start Steering”– Epic Games is proposing an innovative way to collaborate for the entire training community, from geeks to simulation end users	Epic Games, Inc.
1530	Driving Simulator Development with Vortex Studio & Unreal Engine	CM-Labs Simulation
1615	C4ISR: Reducing Cognitive Load in Mission Planning with True 3D Image Visualization	3D Planeta

## 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.



HALL HAPPENINGS

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

(As of 27 October 2019)

Booth	Company Name
381/481	Cole Engineering Service Inc. (CESI)
407	Google Cloud
820	3D Perception
1201	TRU Simulation & Training
1662	Improbable
1748	Lockheed Martin
1768	Scalable Display Technologies
2300	Aegis Technologies Group
2360	Team Defence Australia
2401	Aptima, inc
2810	National Training & Simulation Association
2826	E2M Technologies
2832	Krauss-Maffei Wegmann

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)

1400	Using Artificial Intelligence Technology and Personalized Services for Optimized Dynamic Language Teaching and Learning	Ponddy Education, Inc.
1430	An App-based Approach for Reliably and Efficiently Bringing Users to Fluency in a New Language	Fluent Forever, Inc.

## Tuesday, 3 December – Session 2 (Game Engine Tools)

1600	One World SDK for Unity	SimBlocks LLC
1630	Physically Based Night Vision Goggle Sensor Simulation in Game Engine	Presagis

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

1400	Omni-Directional Treadmill	Infinadeck
1430	The Robot Operating System (ROS) and the Gazebo Simulation Environment	Huntington Ingalls Industries

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

1600	Computer Vision on the Edge	MapBox, Inc.
1630	Disruptive Training Across the Spectrum of Use Cases Using Virtual Immersive Experiences	Enduvo







<b>3D perception</b>	<b>820</b>	<b>BNH Expert Software, Inc.</b>	<b>248</b>
3DPlaneta	1871	<b>Boeing</b>	<b>1059</b>
3D Systems Symbionix	781	<b>Bohemia Interactive Simulations</b>	<b>2534</b>
<b>4C Strategies</b>	<b>1928</b>	<b>Booz Allen Hamilton</b>	<b>1265</b>
4CAST	2680	<b>Brightline Interactive</b>	<b>2426</b>
<b>5DT, Inc.</b>	<b>401</b>	<b>Bugeye Technologies</b>	<b>1386</b>
A. Harold & Associates, LLC	2566	<b>C2 Technologies, Inc.</b>	<b>2220</b>
Acme Worldwide Enterprises, Inc.	2061	CACI	555
ACS Hydraulics, Inc.	619	<b>CAE</b>	<b>1734</b>
Adder Technology	551	CALIBRE Systems, Inc.	387
Adobe, Inc.	3034	<b>Calytrix</b>	<b>1249</b>
Advanced Distributed Learning (Advanced Distributed Learning) Initiative	1159	Camaraderie Foundation, Inc.	3029
<b>Advanced IT Concepts, Inc.</b>	<b>706</b>	Capacitech Energy	3172
<b>Advanced Simulation Technology, inc.</b>	<b>2620</b>	<b>CATI Training Systems</b>	<b>3020</b>
Advanced Tactical Training Systems	425	<b>Carley Corporation</b>	<b>465</b>
<b>Aechelon Technology</b>	<b>1722</b>	CEA Technologies	2360
AECOM	2085	Cervus Defence & Security	663
<b>AEgis Technologies</b>	<b>2300</b>	Cesium	681
<b>Aero Simulation, Inc.</b>	<b>826</b>	<b>Charles River Analytics</b>	<b>1239</b>
Aerospace Driven Technologies, Inc.	1275	Chetu, Inc.	2082
Aertronics	325	Chiron Global Technologies Pty Ltd/ Kinetic Fighting Pty Ltd.	2360
Air Force Technical Application Center	3160	Cisco Systems	720
Air National Guard	1933	<b>Clinkenbeard</b>	<b>323</b>
<b>Alion Science and Technology</b>	<b>1009</b>	CM Labs Simulations	2534
Ameripack	525	Cobra Simulation	1394
<b>Applied Training Solutions (ATS)</b>	<b>287</b>	CodeFirm	3171
Applied Virtual Simulations	2360	Cognitive3D	1180
<b>Aptima, Inc.</b>	<b>2401</b>	<b>Cole Engineering Services, Inc.</b>	<b>2084</b>
AR/VR Pavilion	1180	<b>Collins Aerospace</b>	<b>2501</b>
<b>ARA Virtual Heroes Division</b>	<b>2572</b>	Command Post Technologies, Inc.	1690
Arch Virtual	1887	<b>Concurrent Real-Time</b>	<b>2612</b>
Aries Security	3123	Connections Café and Lounge	100
Army Modeling & Simulation Office	763	Consortium Management Group. Inc. (CMG)	2026
AT&T	1087	<b>Control Products Corporation</b>	<b>2321</b>
Athena-Tek	554	Corning	419
Atlantic Canada Aerospace & Defence Association (ACADA)	1871	Corvalent	3026
Autocomp Management	3127	<b>Cruden B.V.</b>	<b>712</b>
Avalon Holographics	1871	CSIR	2584
Avatar Partners	599	<b>Cubic</b>	<b>1948</b>
Aviation Training Consulting. LLC (ATC)	195	CyberDream	3174
<b>AVT Simulation</b>	<b>449</b>	Cyberith GmbH	1293
Axiologic Solutions and Barbaricum LLC	1591	Cyber Security & Information Systems Information Analysis Center (CSIAC)	2681
BAE Systems	2870	<b>Cybernet Systems Corporation</b>	<b>2656</b>
<b>Bagira Systems, Ltd.</b>	<b>1706</b>	<b>Cymstar</b>	<b>191</b>
<b>Barco, Inc.</b>	<b>1338</b>	Cyviz	1067
Battlespace Simulation, Inc.	1348	Daktronics, Inc.	1187
<b>B-Design3D</b>	<b>2320</b>	<b>David Clark Company Incorporated</b>	<b>524</b>
Bebop Sensors	773	<b>Dedicated Computing</b>	<b>1620</b>
<b>Bihrie Applied Research, Inc.</b>	<b>3040</b>	Defense Acquisition University (DAU)	1881
<b>BIONATICS</b>	<b>2320</b>	Delaware Resource Group of Oklahoma, LLC	295
Blue Marble Geographics	634	Dell	687
BMT	3102	Deloitte	260



Design Concepts	1217	GO2Altitude	2431
Design Interactive, Inc.	2308	Google LLC	407
Diamond Visionics	2000	GREEN AMMO AS	3161
DIGINEXT	2560	GSA FAS & FEDSIM	521
DigitalCM	338	Global Technology Integrations LLC	2226
Digital Projection	887	H2 IT Solutions	595
Displays & Optical Technologies, Inc.	1822	Hampden Engineering Corporation	620
DiSTI Corporation	1380	HP	1113
DMSCO	2372	HTC Vive	2426
domeprojection.com GmbH	1287	HTX Labs	1392
Doron Precision Systems, Inc.	507	Huntington Ingalls Industries	1612
E2M Technologies, Inc.	2826	i2k	3111
Eagle 6 Technical Services, LLC	3173	IDS International	1987
EBC Electronics Corp.	1885	IHSE USA, LLC	418
Eduworks Corporation	2958	Immersive Display Solutions, Inc.	1463
Elbit Systems, Ltd.	2200	Immersive Wisdom, Inc.	522
Electric Picture Display Systems	1768	iMotions	3141
Elite Aluminum Corporation/FORTSUSA	565	Improbable	1662
Embry-Riddle Aeronautical University	242	Industrial Smoke & Mirrors	2800
eMDee Technology, Inc.	880	Industrial Structures	561
Engineering & Computer Simulations, Inc.	1235	Inert Products LLC	1960
Engineering & Manufacturing Services, Inc (EMS)	627	inlusion Netforms UAB	775
Engineering Support Personnel (ESP), Inc.	1227	Innovation Showcase	2588
Epic Games, Inc.	2161	Integration Innovation, Inc.	2672
esc Aerospace US, Inc.	3167	Inter-Coastal Electronics, Inc.	2268
Esri	250	Israel Aerospace Industries Ltd.	1071
ETSA CIC	2685	IT²EC	3014
EWA GSI	624	ITility, LLC	652
Explotrain, LLC	1964	JANUS Research Group, Inc.	1986
Extron Electronics	1109	J.F. Taylor, Inc.	1781
FAA COE TTHP	558	JIRACOR	2080
FAAC, Inc.	1370	Joint Program Manager Medical Modeling & Simulation (JPM MMS)	2185
FARO Technologies, Inc.	632	JRM Technologies	2008
FermiTron, Inc.	3170	JVC Visual Systems	1712
FIRST Robotics	2997	Katmai	700
FlightSafety International	1401	KBR	3135
Florida Troops to Teachers	3197	Kentucky Trailer	1829
FN America, LLC	1481	Knowledge Based Systems, Inc.	520
ForgeFX Simulations	3030	Kratos	1312
FoxGuard Solutions	2068	Krauss-Maffei Wegmann GmbH & Co. KG	2832
Frasca International, Inc.	2157	L3Harris	1449
Full Sail University	1180	Laerdal Medical	2181
Future Leaders Pavilion	2980	Land Forces 2020	2360
G&D North America, Inc.	552	Larsen Motorsports, Inc.	2993
Gaumard Scientific	2480	Laser Shot	1001
GBvi Ltd.	3106	Leidos	1413
GDIT	2238	LEONARDO	872
Geeks and Nerds	3166	Leonardo DRS	395
General Dynamics Mission Systems	2232	Lightspace Technologies	673
George Mason University Serious Games Institute	1982	LLS, Ltd.	3100
Georgia Tech Research Institute	1119	Lockheed Martin	1748
GLESEC	3175	LSI, Inc.	840
Global Technology Integrators LLC	2226		
GlobalSim, Inc.	2020		



Luminar Technologies	2430	Oak Grove Technologies	2392
Lunarline, Inc.	1270	<b>Oakwood Controls</b>	<b>3010</b>
LuxCarta	663	OCPS Orange Technical College	3185
ManTech International	187	Old Dominion University Online	2966
Mantis	342	Opaque Multimedia Pty Ltd.	2360
Manus VR	2081	Operative Experience, Inc.	421
<b>Marathon Targets</b>	<b>1700</b>	OptiTrack	871
Marine Corps System Command (PM TRASYS)	1433	<b>ORBIT Electronics Group</b>	<b>2513</b>
<b>MASA Group</b>	<b>2858</b>	Orlando Science Center (OSC)	3187
<b>Mass Virtual, Inc.</b>	<b>3119</b>	<b>Oshkosh Speciality Vehicles</b>	<b>3052</b>
Matrox Graphics	787	OWI & Vigilante	2580
Maxar Technologies	1980	<b>Panel Products Inc</b>	<b>881</b>
<b>MBX Systems</b>	<b>3004</b>	Paramount Panels, Inc.	420
<b>Meggitt Training Systems</b>	<b>1421</b>	<b>Parsons</b>	<b>836</b>
MEI Technologies, Inc.	3027	PatchPlus Consulting, Inc.	519
<b>MES Simulation &amp; Training Corp.</b>	<b>857</b>	PATCO Electronics	422
<b>MetaVR</b>	<b>1348</b>	Pathfinder Systems, Inc.	883
<b>Metova Federal, LLC (CyberCENTS)</b>	<b>757</b>	<b>Patriot Products LLC</b>	<b>3000</b>
Military Officers Association of America (MOAA)	628	Phoenix TS	560
Mittler Report Verlag GmbH	2683	<b>Pinnacle Solutions, Inc.</b>	<b>1081</b>
MONCH Publishing Group	3028	<b>Pitch Technologies</b>	<b>2326</b>
<b>Moog</b>	<b>1021</b>	PiTech Solutions	3063
Moog, Inc. (E-O Imaging)	656	<b>PLEXSYS</b>	<b>1573</b>
MotionSystems	2534	<b>PLW Modelworks</b>	<b>675</b>
Motum Simulation	2360	<b>Polhemus</b>	<b>1920</b>
<b>MS&amp;T Magazine - Halldale Group</b>	<b>657</b>	<b>Power Innovations Int'l, Inc.</b>	<b>1815</b>
MSI Computer Corp.	319	<b>Pragmatics, Inc.</b>	<b>3158</b>
Mursion	1274	<b>Pratt &amp; Whitney</b>	<b>2014</b>
Muskogee Technology	1985	Precision Flight Controls, Inc.	413
MyComputerCareer	2427	<b>Presagis</b>	<b>2848</b>
Nasco Healthcare	340	Prevaliance, Inc.	2599
NASA	3191	<b>ProActive Technologies, Inc.</b>	<b>453</b>
National Center for Adv of STEM Education (nCSE)	3189	project syntropy GmbH	1281
<b>National Center for Simulation</b>	<b>2208</b>	PTC	258
<b>National Center for Simulation-STEM</b>	<b>3181</b>	<b>Pulau Corporation</b>	<b>3048</b>
National Defense Industrial Association	2810	PureMedSim Technology Group	2281
National Defense Magazine	2810	<b>Q4 Services</b>	<b>1223</b>
National Geospatial Intelligence Agency	451	<b>Quadrant Simulation Systems, Inc.</b>	<b>501</b>
National Guard Association of the United States	622	<b>QuantaDyn Corporation</b>	<b>749</b>
National Training & Simulation Association (NTSA)	2810	Quantified Design Solutions, LLC	3074
NATO	2173	<b>Quantum 3D, Inc.</b>	<b>1049</b>
Navy STEM	3183	Quantum Improvements Consulting	457
Network Allies, LLC	3031	<b>Rapid Prototyping Services</b>	<b>1165</b>
Newman & Spurr Consultancy Ltd.	3018	<b>RAVE Computer</b>	<b>863</b>
Newton Design, LLC	3070	<b>Ravenswood Solutions</b>	<b>2660</b>
Nexter Systems	2832	<b>Raytheon</b>	<b>1037</b>
NextGen Interactions	2669	<b>Real-Time Innovations</b>	<b>2421</b>
NLR-Netherlands Aerospace Centre	630	Resilient	1180
Noetic Group	2360	<b>RGB Spectrum</b>	<b>607</b>
North American Rescue LLC	238	<b>Riptide Software, Inc.</b>	<b>2697</b>
<b>Northrop Grumman</b>	<b>2548</b>	Rite in the Rain	559
Norxe	3011	<b>RPA Electronic Solutions, Inc.</b>	<b>2409</b>
NSTXL	241	<b>RSi Visual Systems, Inc.</b>	<b>812</b>
Nutanix, Inc.	1983	<b>RUAG Schweiz AG</b>	<b>2818</b>

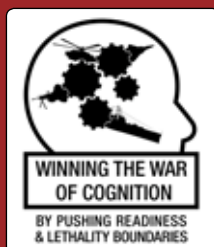




S2MARTS/NSTXL	256	TraumaFX Solutions, Inc.	531
S2 University	3065	<b>TREALITY SVS</b>	<b>1760</b>
SA Photonics	<b>518</b>	TReX/NSTXL	239
<b>Saab Defense and Security</b>	<b>800</b>	<b>TrianGraphics</b>	<b>980</b>
<b>Safety Training Systems, Inc.</b>	<b>1213</b>	<b>Trideum Corporation</b>	<b>2626</b>
<b>SAIC</b>	<b>2149</b>	<b>TRU Simulation + Training</b>	<b>1201</b>
Scalable Display Technologies	1768	Turning Technologies	1883
<b>SCALABLE Network Technologies</b>	<b>613</b>	Twin Oaks Computing	654
SeaBox, Inc.	2429	UCF E2i Creative Studio	3097
Seminole State College of Florida	3195	U.S. JACLEAN, Inc.	459
<b>Senspex, Inc.</b>	<b>548</b>	<b>UFA, Inc.</b>	<b>1926</b>
Serco, Inc.	495	UNIGINE Holding	307
Serious Games Challenge	2880	<b>United Electronic Industries (UEI)</b>	<b>1123</b>
<b>SGB Enterprises, Inc.</b>	<b>2314</b>	U.S. Army PEO STRI	339, 1533
Shen Te Enterprises, Inc.	313	U.S. Army CDC	329
<b>Shephard Media</b>	<b>549</b>	U.S. Navy	249
<b>SimCentric Technologies</b>	<b>1259</b>	U.S. Navy / NAWCTSD	1439
SimCraft	1292	USAF Expeditionary Operations School	621
<b>SimiGon, Inc.</b>	<b>3148</b>	USAF Training Systems Product Group	1539
SimIS, Inc.	2960	Valiant Integrated Services, Inc.	1491
<b>SIMmersion LLC</b>	<b>2521</b>	Valley IT Solutions LLC	3035
<b>SimPhonics, Inc.</b>	<b>1809</b>	<b>Vanguard LED Displays, Inc.</b>	<b>726</b>
<b>Simtek, Inc.</b>	<b>721</b>	Varjo Technologies	1393
<b>Simthetiq, Inc.</b>	<b>2334</b>	VATC - Visual Awareness Technologies & Consulting	660
Simulation and Control Technologies	1861	<b>Vcom3D</b>	<b>2381</b>
SimulationDeck, LLC	771	<b>Veraxx Engineering Corporation</b>	<b>1801</b>
<b>SimX</b>	<b>513</b>	<b>Vertex Solutions</b>	<b>2556</b>
SMART EYE AB	1969	VIOSO	1984
<b>Soar Technology</b>	<b>635</b>	<b>VirTra</b>	<b>1029</b>
Society for Simulation in Healthcare	2283	Virtual Flight Academy	2582
Solinnov Pty Ltd.	2360	Virtual Reality Media, A.S.	553
<b>Sonalyts</b>	<b>648</b>	Virtual Simulation Systems Pty Ltd.	1093
SonoSim, Inc.	2086	VirtuReal	2360
<b>Sony Electronics, Inc.</b>	<b>2348</b>	Vision Engineering Solutions, LLC	3164
Specular Theory, Inc.	1180	<b>VMASC</b>	<b>2864</b>
Starline	550	VRgluv, LLC	1273
<b>Stirling Dynamics</b>	<b>2415</b>	Vricon	681
<b>Strategic Systems, Inc.</b>	<b>301</b>	<b>VT MAK</b>	<b>1322</b>
Symbolic Displays, Inc.	2964	Wacom Technology	3021
Systems Engineering Group, Inc.	254	<b>Wartsila Defense, Inc.</b>	<b>834</b>
<b>Systems Technology Inc - PARASIM</b>	<b>2534</b>	Westar Display Technologies, Inc.	870
Team Defence Australia	2360	<b>WITTENSTEIN Aerospace &amp; Simulation</b>	<b>641</b>
TEC Simulation	529	Women in Defense	2810
Technical Systems Integrators, Inc.	1271	WorldViz VR	243
<b>Tech Wizards, Inc.</b>	<b>1334</b>	World Wide Technology	882
<b>Ternion Corporation</b>	<b>2214</b>	<b>Yorktown Systems Group, Inc.</b>	<b>601</b>
TerraSim Inc.	2534	YTEK Pty Ltd.	2360
<b>Thales</b>	<b>649</b>	<b>ZedaSoft, Inc.</b>	<b>1473</b>
<b>Theissen Training Systems, Inc.</b>	<b>1973</b>	<b>Zeiss</b>	<b>539</b>
TiER1 Performance Solutions	535		
T-Mobile US, Inc.	240		
Tobii Pro	1981		
Touché Technologies	3154		
<b>Trailer Transit, Inc.</b>	<b>618</b>		



# Committees



## Conference Committee

### Service Executives

Col Philip E. Carpenter, USAF, Senior Materiel Leader, Simulators Program Office, Air Force Materiel Command  
BG Michael E. Sloane, USA, Program Executive Officer for Simulation, Training and Instrumentation  
CAPT Tim Hill, USN, Executive Officer, NAWCTSD and Naval Support Activity  
Col "Lou" Lara, USMC, Program Manager, MARCORSYSCOM PM TRASY  
Gregory Knapp, OSD (P&R) Force Readiness & Training

### OSD/Joint Executive

#### Service Principals

Air Force  
Air Force Deputy  
Army  
Navy  
Marine Corps

Tony DalSasso, USAF AFLCMC  
Tracy Titcombe, USAF AFLCMC  
Jesse Campos, U.S. Army PEO STRI  
Diana Teel, NAWCTSD  
Koren L. Odermann, MARCORSYSCOM PM TRASY  
Walter (Shep) Barge, Ph.D., OSD (P&R)/JAEC  
Brian Holmes, Quantum3D Government Systems  
Robert Kleinhample, SAIC  
Jennifer Arnold, Booz Allen Hamilton, Inc.  
Matt Spruill, Trideum Corporation

### OSD Principal

#### Conference Chair

#### Deputy Conference Chair

#### Program Chair

#### Deputy Program Chair

#### Subcommittee Chairs

Education  
Emerging Concepts and Innovative Technologies  
Human Performance, Analysis and Engineering  
Policy, Standards, Management and Acquisition  
Simulation  
Training

Rhianon Dolletski-Lazar, ECS Federal  
Gabe Diaz, Mantech International Corporation  
Ingrid Mellone, HII-MDIS  
Jeffrey Raver, SAIC  
Paul Cummings, ECS  
Benjamin Bell, Ph.D., Eduworks Corporation  
Diane Justice, USAF AFLCMC  
David Milewski, CAE USA MSI  
Lisa Scott Holt, Ph.D., Intelligent Automation, Inc.  
Lee Lacy, Ph.D., The DiSTI Corporation  
VADM Al Harms, USN (Ret.)  
Janet Spruill, Aptima, Inc.  
K. Denise Threlfall, Ph.D.  
Linda Brent, Ed.D., The ASTA Group  
Kara Orvis, Ph.D., Aptima, Inc.  
John Killilea, NAWCTSD  
National Training and Simulation Association  
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The Council of Chairs is a special advisory group to NTSA and the I/ITSEC Committee. The exclusive membership is comprised of previous I/ITSEC Conference Chairs. Drawing on their cumulative experience, these leaders provide a unique perspective and advice for the ongoing mission of I/ITSEC.

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and G.V. (Vince) Amico ( <i>Deceased</i> )	1986 Rodney S. Rougelot	1995 Judith Riess, Ph.D.	2004 Buck Leahy	2013 Cyndi Turner Krisan, CMSP
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Christopher Hedley, University of Central Florida  
Hiram Rodriguez, University of Central Florida  
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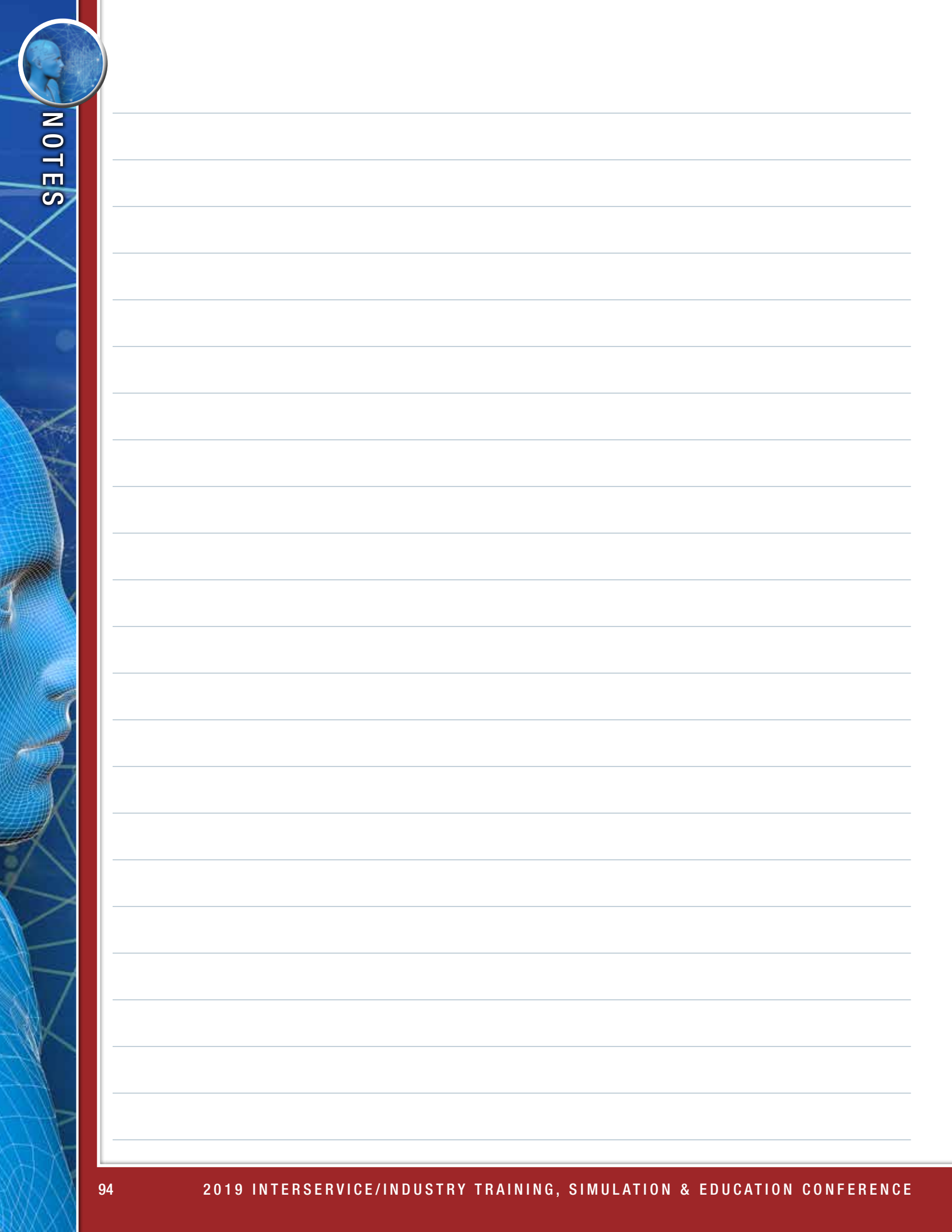
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The image shows a page from a conference program. On the left side, there is a vertical blue banner. At the top of this banner is a circular inset containing a blue-tinted profile of a human head with a starry background. Below this, the word "NOTES" is written vertically in white, bold, sans-serif capital letters. The main area of the page is white and contains numerous horizontal blue lines for writing. At the bottom of the page, there is a solid red horizontal bar. Inside this bar, on the left, is the page number "94" in white. To the right of the page number, the text "2019 INTERSERVICE/INDUSTRY TRAINING, SIMULATION & EDUCATION CONFERENCE" is written in white, sans-serif capital letters.



# 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 station 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

BRANCH	CONFERENCE AND GENERAL SESSIONS	BANQUET
Army	ACUs or Duty Uniform	Army Blue ( <i>Army Evening Mess Optional</i> )
Marine Corps	Service "C"	Evening Dress ( <i>Dress Blue "B" or Service "A" Optional</i> )
Navy	Service Khaki, Navy Service Uniform	Dinner Dress White ( <i>Service Dress White Optional</i> )
Air Force	Blues ( <i>Short or Long Sleeve</i> )	Mess Dress or Semi-Formal
Coast Guard	Tropical Blue Long	Dinner Dress White ( <i>Service Dress White Optional</i> )
Civilian	Business Attire	Black Tie ( <i>Optional</i> )



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>.

If you prefer to book via telephone, friendly and knowledgeable agents are ready to take your calls Monday through Friday from 8:00 AM - 6:00 PM CT at (855) 992-3353

## 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.



- 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.iritetrolley.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.

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





## 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.

## 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 Unequaled 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](mailto:kkeney@ndia.org)  
or **Alex Mitchell** (703) 247-2568 • [amitchell@ndia.org](mailto:amitchell@ndia.org) • Booth 2810

## 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](http://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.

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](mailto:jwilliams@ndia.org); check out more details on the I/ITSEC News page of <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](mailto:cdwyer@ndia.org). Visit the NTSA website [Trainingsystems.org](http://Trainingsystems.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](http://www.ndia.org) or contact Zoila Martinez at [zmartinez@ndia.org](mailto:zmartinez@ndia.org).

## Women In Defense

A NATIONAL SECURITY ORGANIZATION



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](http://www.womenindefense.net)



SPONSORING ASSOCIATION

## 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](http://SimProfessional.org) or contact Carol Dwyer at [cdwyer@NDIA.org](mailto:cdwyer@NDIA.org)



**FOR LIFE-THREATENING EMERGENCIES DIAL 911  
SECURITY HOTLINE DURING I/ITSEC: (407) 685-6111**

**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:

<b>Army</b>	902 Military Intelligence
<b>Navy, USMC, Coast Guard</b>	Naval Criminal Investigative Service
<b>Air Force</b>	Air Force Office of Special Investigation
<b>Contractors</b>	Defense Counterintelligence and Security Agency (formerly Defense Security Service)

**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



Rosen Shingle Creek Golf Club

9939 Universal Blvd, Orlando, FL 32819 • 407-996-9933 • [www.shinglecreekgolf.com](http://www.shinglecreekgolf.com)



GOLF TOURNAMENT

## Limited Availability – Register early!

### Deadlines

Golf On-Line Registration	22 November
Sponsorship	19 November

### Tournament Time

Sunday	1100 Registration	1230 Shotgun
Monday	0630 Registration	0730 Shotgun

### Point of Contact

Debbie Berry 407-748-3807  
[debbie.berry@lmco.com](mailto:debbie.berry@lmco.com)

### Format

Captain's Choice / Scramble

### Pairings & Requests

Final assignments and pairings will be made by the tournament coordinator. Priority is based upon receipt of payment.

**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.

### Cancellations

Must be received via email to [debbie.berry@lmco.com](mailto:debbie.berry@lmco.com) by close of business 15 November to receive 50% refund. No refunds thereafter. Substitute golfers are permitted.

### On-Line Registration

- Register and/or select sponsorship at [www.iitsec.org/ATTENDEES/PLANNINGYOURSTAY/Pages/default.aspx](http://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](http://www.iitsec.org)

Hole Sponsor	\$500
Beverage Cart	\$2,500
Hole-in-One	\$2,500
Boxed Lunch	\$3,000

### Sponsors

Send your logos via email to [debbie.berry@lmco.com](mailto: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>.*



# ANNUAL I/ITSEC 5K RUN/WALK/ROLL 2019



**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](http://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  
\$25**  
until August 30

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

## TITLE SPONSOR



Email Sean Osmond for Race Information at [iitsec5k@gmail.com](mailto:iitsec5k@gmail.com) or  
Shannon Burch for Sponsorship information at [sburch@ndia.org](mailto:sburch@ndia.org)



# See You Next Year!







NATIONAL TRAINING AND SIMULATION ASSOCIATION  
THE WORLD'S LARGEST MODELING & SIMULATION EVENT

# I/ITSEC | INTERSERVICE/INDUSTRY TRAINING, SIMULATION & EDUCATION CONFERENCE

THE FUTURE IS NOW



*Save the Date!*  
*November 30-*  
*December 4, 2020*  
*[www.iitsec.org](http://www.iitsec.org)*

NOVEMBER 30 – DECEMBER 4, 2020 ► [WWW.IITSEC.ORG](http://WWW.IITSEC.ORG) ► ORLANDO, FLORIDA

**NDIA**





# 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.

#### **Papers/Tutorials Completion Process**

Follow the  
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](mailto:mspruill@trideum.com)

#### **I/ITSEC 2020 Tutorial Board Co-chairs**

David Milewski  
CAE USA MSI  
757-224-5491 | [dave.milewski@caemsi.com](mailto:dave.milewski@caemsi.com)

Lisa Scott Holt, Ph.D.  
Intelligent Automation, Inc.  
301-294-5212 | [lholt@i-a-i.com](mailto:lholt@i-a-i.com)

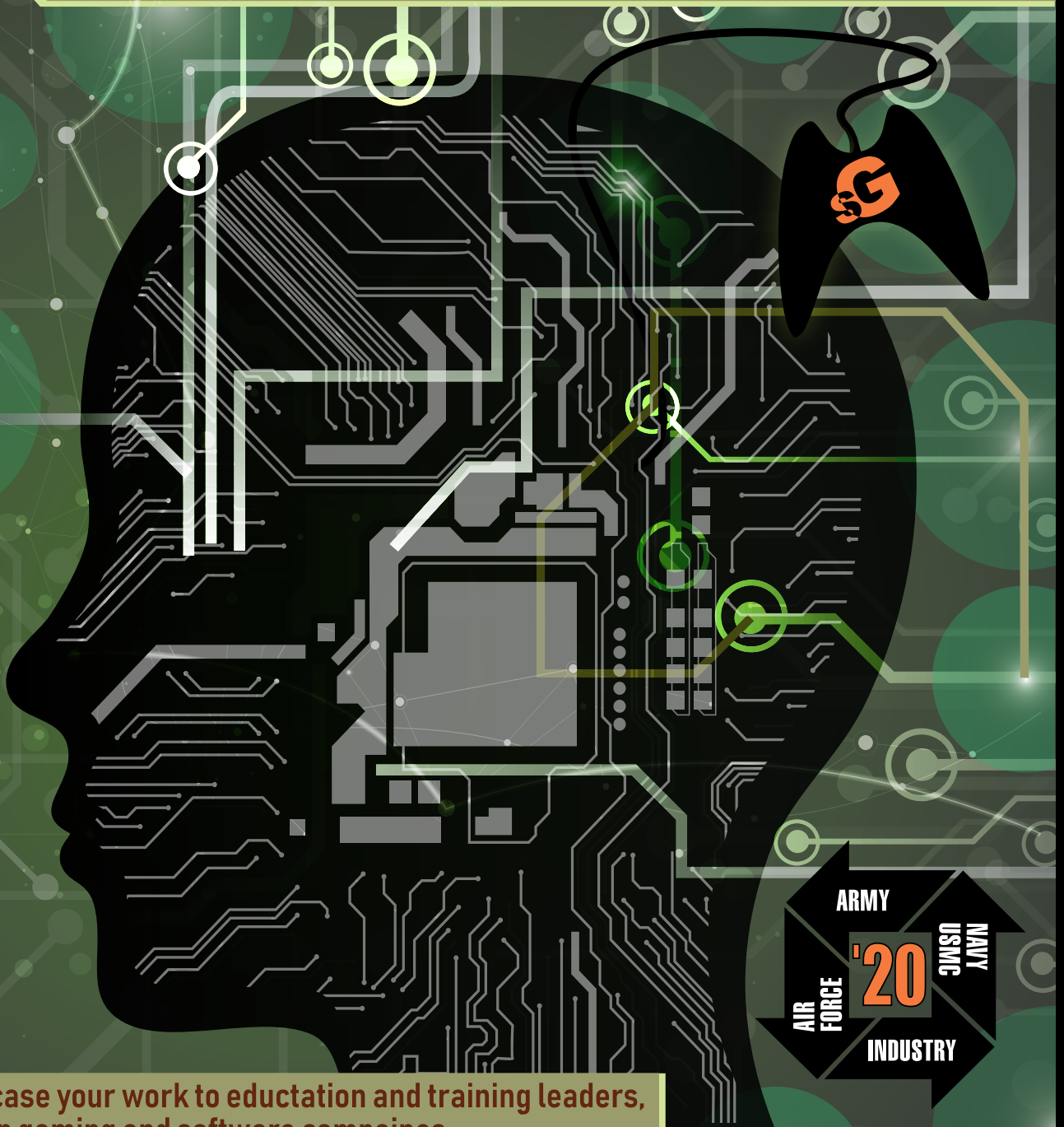
# SERIOUS GAMES

## SHOWCASE & CHALLENGE

### Submissions Open August 2020

Compete for prestigious awards including:

Innovation Award | People's Choice | Students' Choice | Best XR | Best in Category



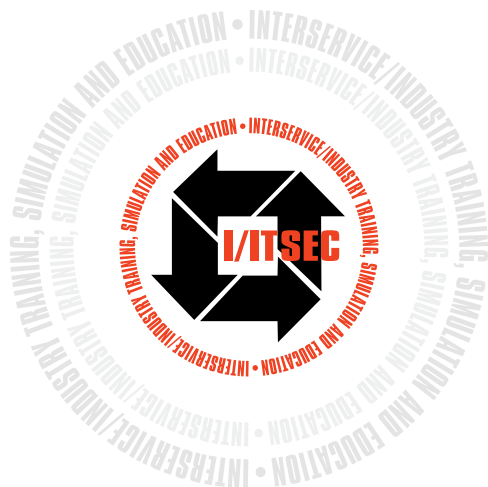
Showcase your work to education and training leaders,  
and top gaming and software compaines.

Orange County Convention Center NOV. 30 - DEC. 4, 2020

More Information:  
[sgschallenge@gmail.com](mailto:sgschallenge@gmail.com)

[www.sgschallenge.com](http://www.sgschallenge.com) | [www.iitsec.org](http://www.iitsec.org)





# I/ITSEC *Honors all* **VETERANS**

Past, Present and Future

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for their support of the  
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and **I/ITSEC STEM Initiative**

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Integration Innovation, Inc. (i3)

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<http://www.iitsec.org>