Congressional Modeling and Simulation Event

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

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

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

Bobby Scott*
Caucus Co-Chair
Virginia 3rd District

Stephanie Murphy*
Caucus Co-Chair
Florida 7th District

John Rutherford*
Caucus Co-Chair
Florida 4th District

Martha Roby*
Caucus Co-Chair
Alabama 2nd District

Robert Aderholt*
Alabama 4th District

Jack Bergman
Michigan 1st District

Gus Bilirakis*
Florida 12th District

Mo Brooks*
Alabama 5th District

Vern Buchanan*
Florida 16th District

Ken Calvert*
California 42nd District

John Carter*
Texas 31st District

Steve Cohen*
Tennessee 9th District

Mike Conaway*
Texas 11th District

John Cornyn
Texas

Ted Cruz
Texas

Susan Davis*
California 53rd District

Dianne Feinstein
California

Virginia Foxx*
North Carolina 5th District

Duncan Hunter
California 50th District

Tim Kaine
Virginia

Doug Lamborn*
Colorado 5th District

Elaine Luria
Virginia 2nd District

Ed Markey
Massachusetts

Scott Peters*
California 52nd District

Bill Posey*
Florida 8th District

Marco Rubio
Florida

C.A. Dutch Ruppersberger*
Maryland 2nd District

Mark Warner
Virginia

Elizabeth Warren
Massachusetts

Joe Wilson*
South Carolina 2nd District

Robert Wittman*
Virginia 1st District

*denotes members of the Congressional M&S Caucus

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

SIGNATURE EVENT

WINNING THE WAR OF COGNITION

I/ITSEC Fellow 2019

MONDAY, 2 DECEMBER
1600 – 1730 • ROOM S310C
SE2

I/ITSEC 2019 Fellow

Richard Fujimoto, Ph.D.

About the 2019 Fellow

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

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

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

Come See the I/ITSEC Fellow Presentation

Parallel Discrete Event Simulation: Past, Present and Future

Richard Fujimoto, Ph.D., focused his I/ITSEC Fellows paper on his personal views of the origins and development of the Parallel Discrete Event Simulation (PDES) field, as well as directions for future development. In presenting the early history of PDES, Richard tells of two distinct solutions to attack the time synchronization problem. The solutions developed were quite different since the application contexts in which they were applied dictated opposite approaches. He then discusses efforts to evaluate the performance of the competing camps, known as conservative and optimistic synchronization. Richard led the effort to define the time management services for the High Level Architecture (HLA), integrating both conservative and optimistic synchronization approaches. His legacy with this work ensures time stepped, real-time, and event-driven simulations can interoperate temporally within a federation. He concludes his paper and presentation by discussing commercialization efforts as well as future research in PDES, paying particular attention to updated computing platforms.

Session Chair:
Margaret Loper, Georgia Tech
Research Institute

Senior Leader Panel

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

Panelists
Fred Drummond, SES
Deputy Assistant Secretary of Defense (Force Education and Training), Office of the Secretary of Defense

Vice Admiral DeWolfe Miller, III, USN
Commander, Naval Air Forces/Commander, Naval Air Force, U.S. Pacific Fleet

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

Brigadier General Ilamrs Lejins, NATO
Latvian Armed Forces
ACOS Joint Force Development at NATO Allied Command Transformation

RADM Robb, USN (Ret.) Mr. Drummond, SES VADM Miller, USN Maj Gen Jacobson, USAF

MajGen Mullen, USMC BG Michael, USA BGEN Leijins, 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.

5G — From Hype to Reality

Moderator
Fred Drummond, SES
Deputy Assistant Secretary of Defense (Force Education & Training), Office of the Secretary of Defense

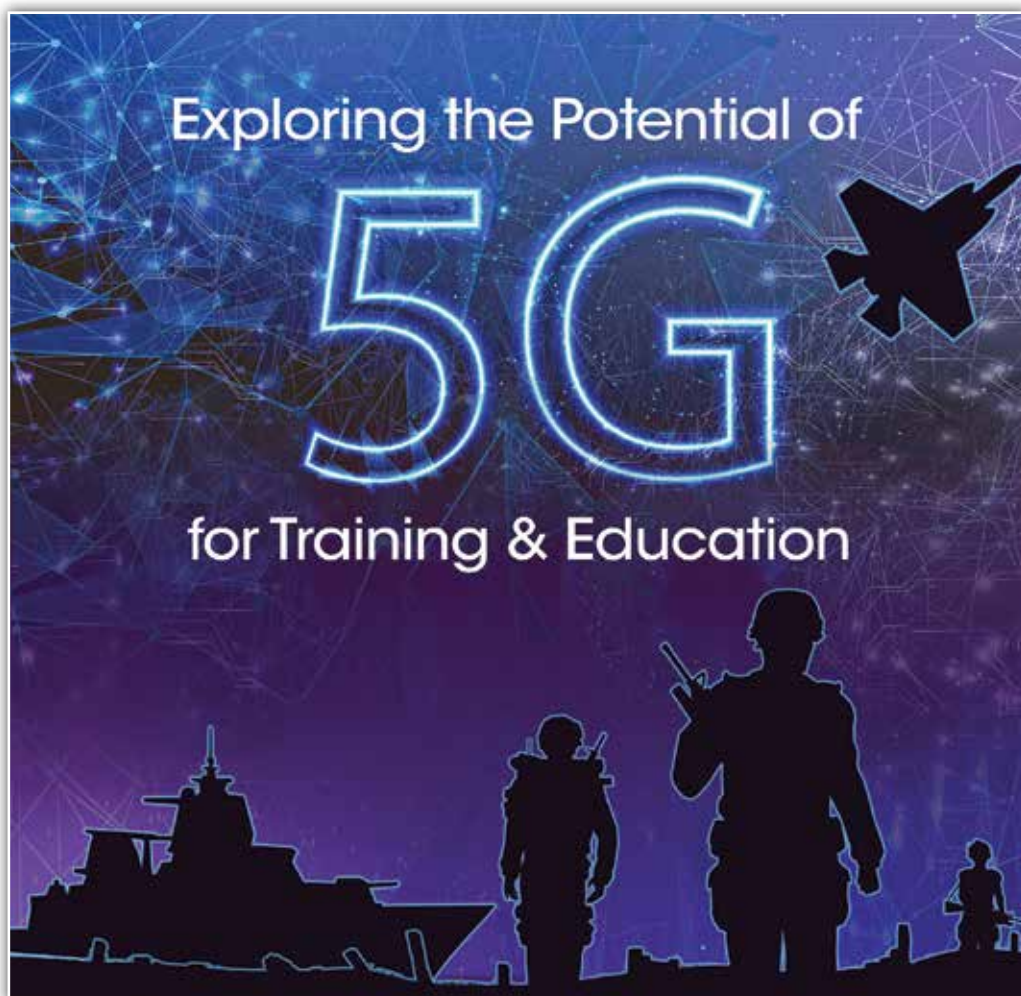## Panelists
Major General Maria Gervais
Director, Synthetic Training Environment Cross Functional Team, U.S. Army Futures Command

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

Sal D'Itri
Chairman, National Spectrum Consortium

Exploring the Potential of 5G for Training & Education

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 21ˢᵗ 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, todays Warfighters and Commanders can't leverage available data (e.g., for improved decision-making) as much as it is desired and required to dominate complex theaters.

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

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

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

Data – What You Should Know About It
Data and information systems (including simulators and C2 systems) impact all aspects of 21ˢᵗ century defense from acquisition and training to operations and missions. This event gives every warfighter, commander, system engineer, project manager, and leadership a true view on the value of data, and what each and every one of you can do to really leverage data.

Session Chair:
Sean Carey, USAF/AMC/A3TD

WINNING THE WAR OF COGNITION

AI Game Theory: Game Changing or Game Over? (USSOCOM)

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 (USSO-COM), 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

Navy Flag Officer Panel – The Navy the Nation Needs Now

PIVOT SPEED LETHALITY

WINNING THE WAR OF COGNITION

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

Panelists
Forrest Crain, Ph.D.
Director, Center for Army Analysis & U.S. Army Modeling and Simulation Office

John W. Diem, SES
Executive Director, U.S. Army Operational Test Command

Royce Manis
Highly Qualified Expert Soldier Lethality CFT Army Futures Command

Colonel Joseph M. Nolan
Deputy Director, STTC

Lori Mongold
Deputy Chief of Staff, Global Force Management, Chief Management Officer Headquarters Department of the Army, G-3/5/7

Lieutenant Colonel Carlos J. Kavetsky
M&S Integration Officer, SR Division, U.S. Army Modeling and Simulation Office

Glen Quesenberry
Program Manager, Army Geospatial Command

COL Gilman

Dr. Crain

Mr. Diem, SES

Mr. Manis

COL Nolan

Ms. Mongold

LTC Kavetsky

Mr. Quesenberry

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

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
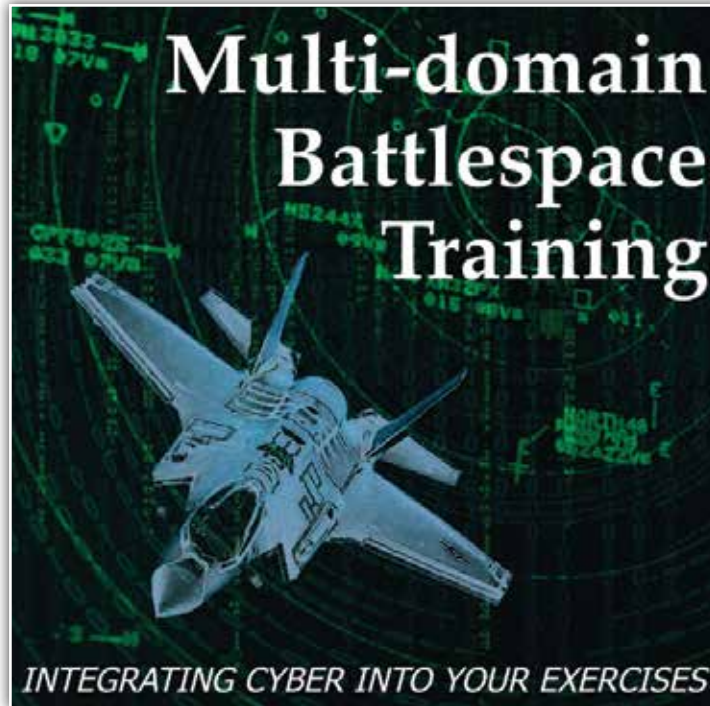
Lt. Gen. Weggeman   Ms. McArdle   LTC Bates, Ph.D.

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, DDC5I, Joint Fires Division

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

| Mr. Reid | Mr. Whitehead | MG Karmazin | CDRE Norris | Mr. Culton |

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

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

Iron Dev

A "COOKING SHOW" EVENT FOR DEVELOPERS

Main Event (Show)

THURSDAY, 5 DECEMBER
1000 – 1130 • LAUNCH PAD

BOOTH 793

Team Preparations

MONDAY, 2 DECEMBER
0830 – 1800 • ROOM S330G

TUESDAY, 3 DECEMBER
0830 – 1800 • ROOM S330G

WEDNESDAY, 4 DECEMBER
0830 – 1800 • ROOM S330G

FE1

Co-Hosts

Bob Kleinhample
Vice President, Training
Solutions SAIC

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

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

Judges

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

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

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

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

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

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

The competition format will provide a fun and professional development opportunity to help grow future leaders in our developer community.

Session Chair:
Kara Orvis, Aptima, Inc.

Best from Around the Globe

Presenters

MODSIM WORLD
Ivar Oswalt, Ph.D., CMSP
The MIL Corporation

Tim Cooley, Ph.D.
DynamX Consulting

ITEC
Jeanine Vlasblom
Netherlands Aerospace
Centre NLR

Best from Around the Globe features the Best Paper awardees of MODSIM World and ITEC. Each of the winners was selected by a committee and criteria specific to the particular global conference focus and theme. Come hear the award winners from MODSIM World and ITEC offer their outstanding presentations from these prestigious international conferences.

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

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

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

This paper describes the development and evaluation of a scan pattern monitoring system using augmented reality (AR). The system enables instructors to monitor scan patterns of pilots by non-intrusively tracking the pilot's eyes and displaying the scan patterns to the instructor through augmented reality. Subject matter experts (pilot instructors) evaluated this application as a support for the debriefing.

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

FOCUS EVENT

WINNING THE WAR OF COGNITION

Acquisition Agility

THE NAVY WAY

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

Participants
Captain Frank Futcher
Director, NavalX
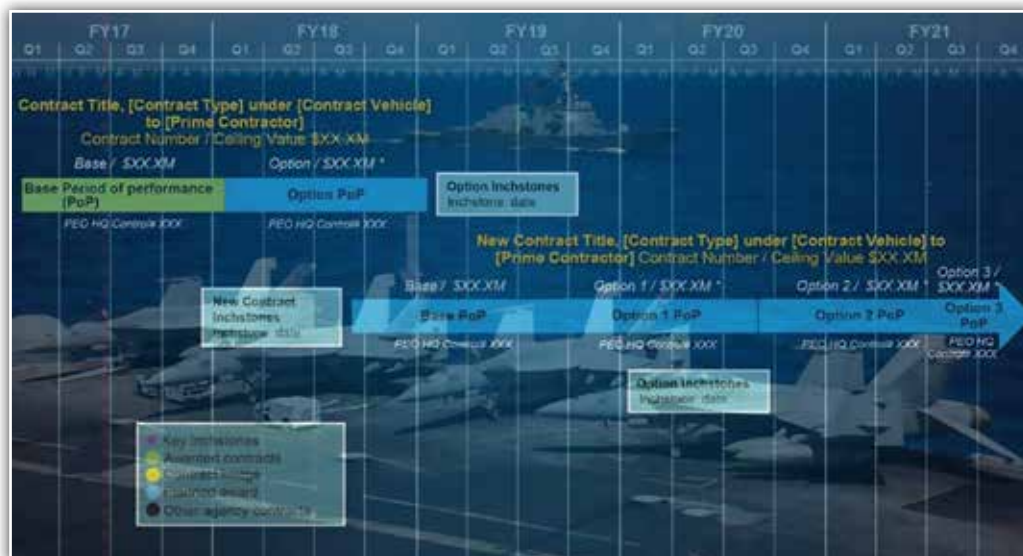
Commander Sam "Chubs" Gray
Tech Bridge Director, NavalX

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.

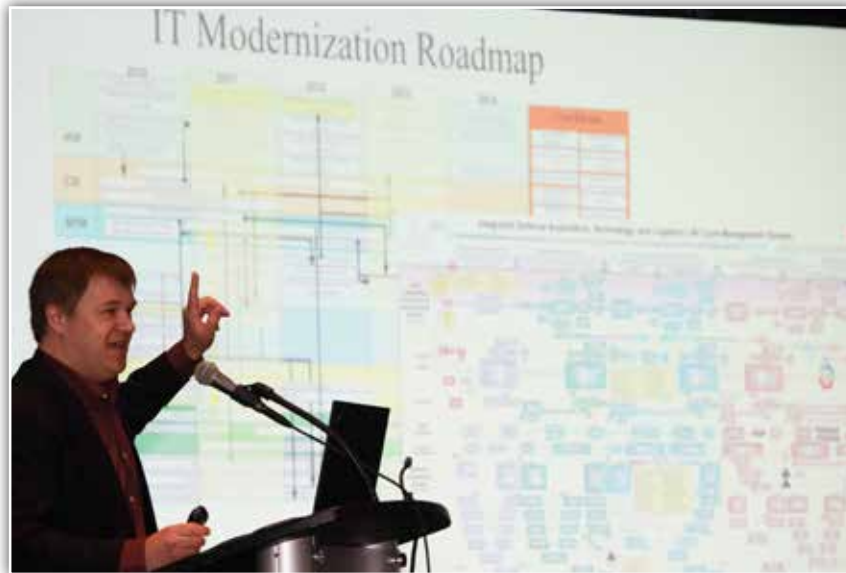**Session Chair:**
Eric Jarabak, PM TRASYS ENG

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

Big Data in Training

WHAT'S IN IT FOR ME?

Moderator
Commander Hank Phillips, Ph.D.
Operational Psychology Department Head, Naval Aerospace Medical Institute

Participants
Nelson Lerma, Ph.D.
Data Science Lead, Naval Air Warfare Center Training Systems Division

Keith Brawner, Ph.D.
Senior Engineer, Army Futures Command – Combat Capabilities Development Command, Simulation and Training Technology Center

Has Big Data lived up to the hype? Behold a spirited debate unfold between data scientists from the Army and Navy training worlds about the troubles, possibilities, and results from exploring the Big Data promise. If we are going to build the AI and Deep Learning capability of tomorrow what do we need to do today? Attendees are invited to add questions to the conversation.

Imagine 2030: AI-Empowered Learning

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

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
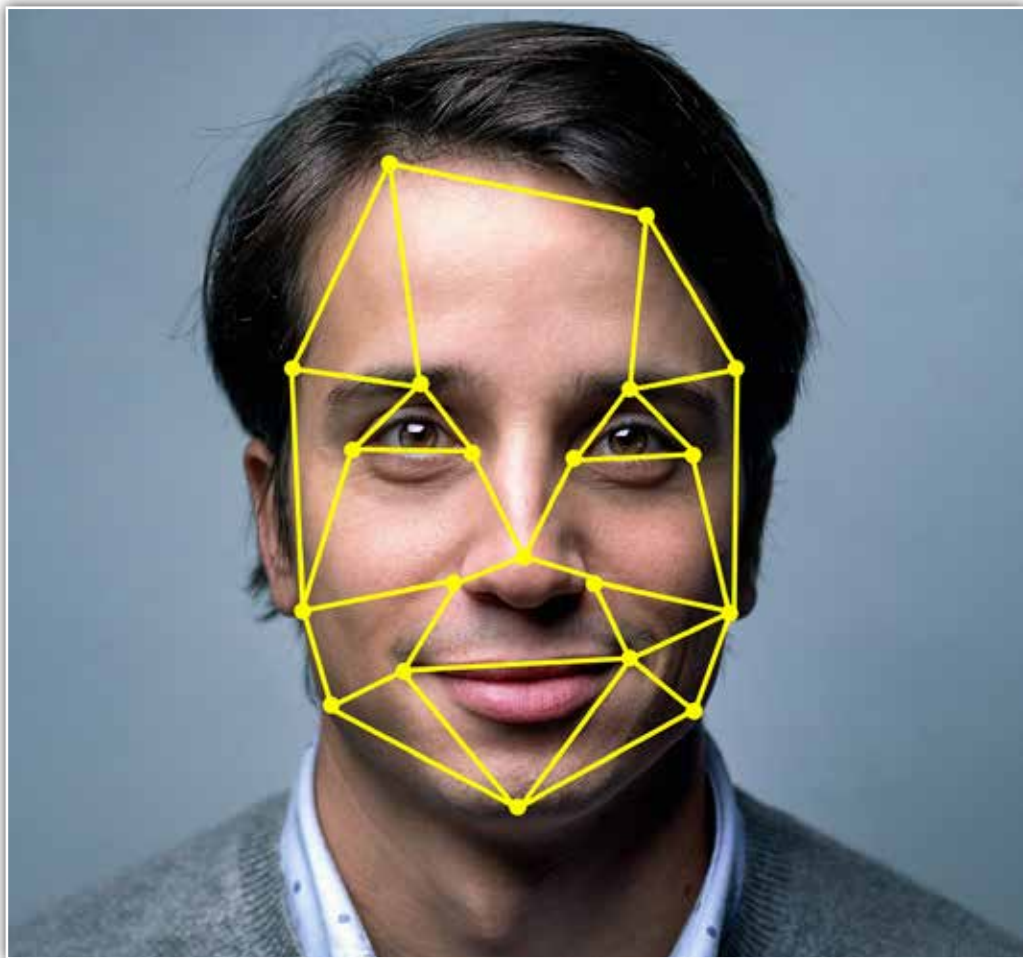Executive Officer, Soar
Technology

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.

Please join us for this engaging session!

Session Chair:
Nina Deibler, Serco, Inc.

Modernizing Learning

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
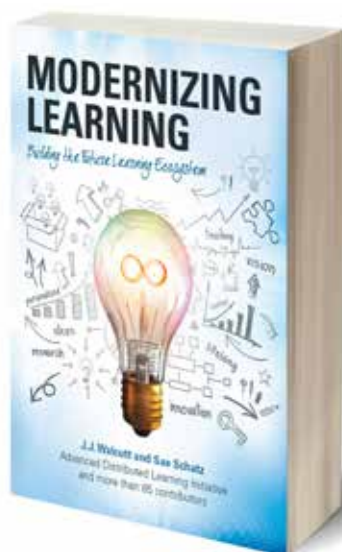Education

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

TECH INFRASTRUCTURE — DESIGN — COMMITMENT — GOVERNANCE — POLICY — HUMAN INFRASTRUCTURE

Modernizing Learning is an open-access publication, available at no cost from the Government Publishing Office.

| 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.
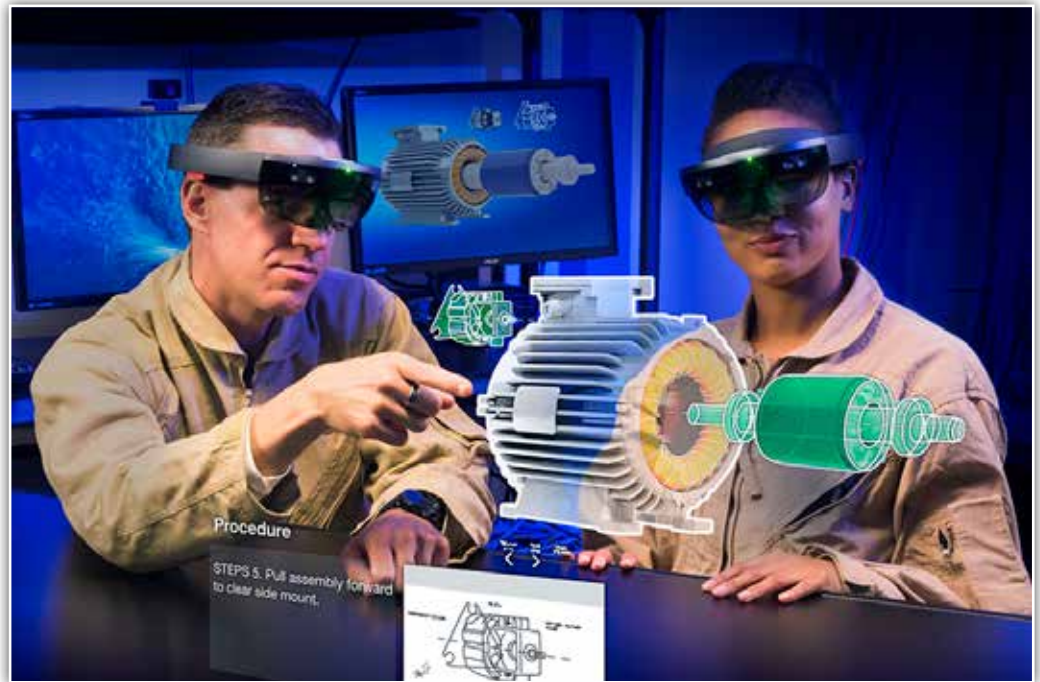RTG Member, Skydome (Sweden)

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 Sannandeji 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

Conceptual Modeling of Adaptive Instructional Systems (IEEE Project 2247.1)

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

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

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

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

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

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

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

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

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

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

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

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, Thinke Company, (United Kingdom)

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

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

Session Chair: Leslie Dubow, VHA EES

COMMUNITY OF INTEREST

COMMUNITY OF INTEREST

Adaptive Instructional System Interoperability Standards (IEEE Project 2247.2)

Learning Engineering: A New Academic Discipline and Engineering Profession

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

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

This will provide insight to the I/ITSEC audience regarding:
• Learning engineering as an academic and career field
• Learning-technology, international development efforts
• Learning-technology, international standards
• Brings new learning scientists and engineers to I/ITSEC

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

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

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

Session Chair: Randy Jensen, Stottler Henke Associates Inc.

Session Chair: Andrew Koch, NAWCAD

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

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

As AISs proliferate and interest in such systems grows, there is notable variation in providers' claims about the features of their AISs. Potential consumers now have to sort out answers to 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

COMMUNITY OF INTEREST

WINNING THE WAR OF COGNITION

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

WINNING THE WAR OF COGNITION

Air Force Acquisition Update

Session Chair:
Rob Lechner,
The Boeing Company

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

The session will be two briefings followed by Q&A.

Moderator
Tony DalSasso
Engineering Technical Advisor
Simulators Program Office

Panelists
Mr. Paul Waugh, SES
Program Executive Officer
Agile Combat Support Directorate

Colonel Philip Carpenter
Senior Materiel Leader
Simulators Program Office

U.S. Army PEO STRI TSIS Update

Session Chair:
Amy Motko,
Carley Corporation

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

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

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

Navy Vision from the Training System's Program Offices

Session Chair:
John Hodak, NAWCTSD

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

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

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

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

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

Jimmy Lee
Director of Submarine Training, NAVSEA O7TR

Industry Days

U.S. Air Force

Training Systems Acquisition (TSA) IV
Monday, 2 December • 1500 – 1700 • Room S329

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

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

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

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

U.S. Army

Synthetic Training Environment (STE) Update to Industry
Monday, 2 December • 1300 – 1430 • Room S330EF

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

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

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

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

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

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

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

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

U.S. Marine Corps

Advanced Small Arms Lethality Trainer (ASALT)
Monday 2, December • 1300 – 1400 • Room S230B

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

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

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

INTERNATIONAL 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)

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.

Launch Pad

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