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.

✈ 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)

TUTORIALS

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.

TUTORIALS

WINNING THE WAR OF COGNITION

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 or 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.

TUTORIALS

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.

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. Schmorrow holds a Ph.D. in Experimental Psychology from Western Michigan University, as well as M.S. degrees in Psychology and Philosophy. He retired from the U.S. Navy as a Captain in 2013, after 20 years of service.

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.

TUTORIALS

WINNING THE WAR OF COGNITION

TUTORIALS

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.

TUTORIALS

WINNING THE WAR OF COGNITION

TRACK 5: M&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 Physic 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 Material Command. Ms. Youngblood has a B.A. in mathematics as well as B.S. and M.S. degrees in computer science.

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

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.

TUTORIALS

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

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

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.

TRACK 3: ARCHITECTURES • 1430 - 1600 • ROOM S320D

Introduction to HLA
(1916)

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.

TRACK 4: THINK IT THROUGH • 1430 - 1600 • ROOM S320GH

Simulation Conceptual Modeling Theory and Use Cases
(1943)

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.

WINNING THE WAR OF COGNITION

TUTORIALS

TUTORIALS

Design of Experiments: Applications for the Simulation Profession
(1918)

Superforecasting: Proven Practices for Leveraging Human Ingenuity
(1921)

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.

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.
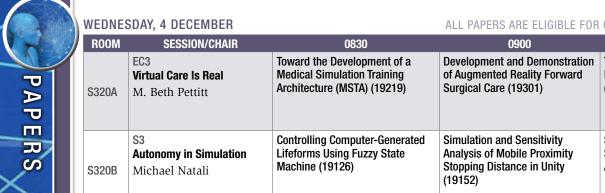
Presenter

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 **Cyber: Build Once, Reuse Often** 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 **Simulation Architectures** 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 **Collaboration: It Takes Two to Tango** 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 **Best from Around the Globe** 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 **There's Reality and There's Virtual Reality** 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 **Enhanced Add-ons: Stories and Games** 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 **Learning Building Blocks** 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 **Synthetic Terrain Environments** 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 **What's Up in the Joint Integrated Training Environment** 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)

PAPERS

ROOM	SESSION/CHAIR	0830	0900	0930
S320A	**EC3** **Virtual Care Is Real** 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** **Autonomy in Simulation** 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** **Measure Twice, Execute Once** 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** **Instruction; Reconstruction** 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** **Don't Forget Your Towel: The Hitchhiker's Guide to Cognition** 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** **See Me, Hear Me, Touch Me** John Burwell	Human-liked Auditory Capability for Intelligent Virtual Agents (19125)	Mid-air Haptics in Aviation (19184) ✈	Utilizing Augmented Reality for Air Force Maintenance Training (19329)
S320B	**S4** **Adapting the Simulation Toolbox** Angela Alban	Lessons Learned in the Experimental Use of Simulated Malodors to Support Live Training (19107)	Adapting Existing Simulation Architectures to Enhance Tailored Instruction (19239)	Tactical Decision Kits for Infantry Training (19341)
S320C	**P4** **Big Data** Mike Merritt	Access Control in the Era of Big-Data Driven Models and Simulations (19115)	Privacy Challenges in DoD Big Data Analytics (19210)	Cybersecurity Strategies for Accrediting Experience API (19308)
S320D	**ED2** **Transforming Military Learning** Kelly Hale, Ph.D.	Implementing Change for Greater Learning, Readiness and Lethality (19289)	A Once in a Generation Opportunity to Transform RAF Training (19294) ✈	Twenty-Five Emerging Trends in Learning and Their Implications for Military Partners: An International Study (19299) ✈
S320F	**T2** **Tag You're It: Team Training & Oversight** 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** **Best Papers** Chuck Wythe	ECIT – Reinforcement Learning for Automated Textual Reasoning (19150)	Education – Enhancing Learning Outcomes through Adaptive Remediation with GIFT (19275)	HPAE – Simulating Augmented Reality Spatial Accuracy Requirements for Target Acquisition Tasks (19343)

PAPERS

ROOM	SESSION/CHAIR	1400	1430	1500
S320A	EC5 **Perception Is Reality** Harry Sotomayor	Augmenting Cyber Assessment through Dynamic Malware Analysis (19249)	Visualizing Electromagnetic Spectrum Phenomena in Augmented Reality (19298)	
S320B	S5 **Engineering Simulation Solutions** 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 **Emerging Approaches for Simulation In Acquisition** 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 **Evaluation of XR Tools** 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 **Training, Accelerated** 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 **Best Papers** 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 **AI in the Kill Chain** 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 **Improving Computer Generated Forces** 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 **Acquisition: Streamlining Standards and New Approaches** 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 **Tools for M&S Educators** 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)

PAPERS

WINNING THE WAR OF COGNITION

PAPERS

ROOM	SESSION/CHAIR	0830	0900	0930
S320A	EC7 **Emerging Models for Training Value and Infrastructure** 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 **Advancing Virtual Reality and Training** 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 **Novel Applications: Back to the Future** 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 **What Gets Measured, Gets Done** 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 **Lean Mean Learning Machine** 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 **Wargaming and Planning** John Huddlestone, 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 **Concepts In Agility and Risk** 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 **21st Century Learning** 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 **Human Performance Pot Pie** 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 **Improving Training through Realistic Environments and Architectures** Thomas Yanoschik, CMSP	Impact of Malodors on Tourniquet Application: A Longitudual 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 **New Thinking About How Machines "Think"** 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 **Radio Frequencies** Nina Deibler	Jamming Techniques 2.0 (19224)	Radio Network Automation for Operational Testing: A Practical Resource for Radio Networks Planning (19366)	
S320D	ED6 **Start Making Sense: Strengthing Interpersonal Communication** 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, Anaylsis 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 Steinhauser, 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

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BP3   TUESDAY • 3 DECEMBER • 1400 • ROOM S320D
Best from Around the Globe
Session Chair: Amanda Davies, Ph.D.

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

ITEC Best Paper: Making The Invisible Visible: Increasing Pilot Training Effectiveness By Visualizing Scan Patterns of Trainees Through AR ✈
Jeanine Vlasblom, Netherlands Aerospace Centre NLR

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 Heidelbaugh, 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

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EC2   TUESDAY • 3 DECEMBER • 1600 • ROOM S320A
Learning Building Blocks
Session Chair: Tim Woodard, NVIDIA
Session Deputy: Wendy Johnson, Ph.D., USAF HQ AETC

Building the World - Could AI Build Our Synthetic Environments? (19180)
Graham Long, Thales

Reinforcement Learning for Computer Generated Forces Using Open-Source Software (19197) ✈
Johan Källström, Saab; Fredrik Heintz, Linköping University

Use of Natural Language Processing to Extract Technical Competency Frameworks from Maintenance Task Analyses (19255)
Wayne Gafford, Department of Defense, U.S. Navy; Jeanne Kitchens, Southern Illinois University Center for Workforce Development; Fritz Ray, Eduworks Corporation

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EC3   WEDNESDAY • 4 DECEMBER • 0830 • ROOM S320A
Virtual Care Is Real
Session Chair: M. Beth Pettitt, Army
Session Deputy: Tyson Kackley, MCSC DC, SEAL, M&S Division

Toward the Development of a Medical Simulation Training Architecture (MSTA) (19219)
Harald Scheirich, SimQuest LLC; Jeffrey Beaubien, Ph.D., Aptima, Inc.; Rodney Metoyer, BioMojo; Gianluca De Novi, Ph.D., Massachusetts General Hospital/Harvard Medical School; Timothy Kelliher, SimQuest

Development and Demonstration of Augmented Reality Forward Surgical Care (19301)
Brandon Conover, Ph.D., Jerry Heneghan, BioMojo LLC; Tyler Harris, Womack Army Medical Center; Geoffrey Miller, Telemedicine & Advanced Technology Research Center (TATRC)

The Application of Augmented Reality for Immersive TC3 Training (19379)
Alyssa Tanaka, Jeffrey Craighead, Ph.D., Glenn Taylor, Soar Technology

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 Technolgy

Implementing Change for Greater Learning, Readiness and Lethality (19289)

Kendy Vierling, Ph.D., USMC, TECOM / Future Learning Group

A Once in a Generation Opportunity to Transform RAF Training (19294) ✈

Audrey Caldeira-Hankey, Defence Science Technology Laboratory (Dstl) UK MOD; Helen Dudfield, QinetiQ; Lindsay Sargent, HQ Air Command

Twenty-Five Emerging Trends in Learning and their Implications for Military Partners: An International Study (19299) ✈

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

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ED3   WEDNESDAY • 4 DECEMBER • 1400 • ROOM S320D

Evaluation of XR Tools

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

Increasing XR Technology's Return on Investment Through Media Analysis (19327) ✈

Martin Bogan, Scott Bybee, CAE USA; Jay Bahlis, BNH Software

Air University Multi-modal Research Course on VR/AR and Related Technologies (19388)

Col Tony Millican, Ph.D., Dennis Armstrong, Ph.D., Air University

Evaluation of sUAS Education and Training Tools (19136) ✈

Brent Terwilliger, Ph.D., Christian Janke, Kristy Kiernan, Joseph Cerreta, Embry-Riddle Aeronautical University; Andrew Shepherd, Ph.D, Sinclair College National UAS Training and Certification Center

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ED4   WEDNESDAY • 4 DECEMBER • 1600 • ROOM S320D

Tools for M&S Educators

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

Track Mobile Learning with Secure Access Using xAPI and CAC (19102)

Paul Miller, Ilya Voloshin, LSI, Inc.

Conducting Training and Simulation Research: A Primer for Practitioners (19179) ✈

Philip Temby, Susannah Whitney, Defence Science and Technology

Neuro-Designer: Informing The Development of Learning Solutions Through Application of Neuro Metrics (19266)

Adam Hall, Nervanix, LLC; Stephen J. Kenton

ED5   THURSDAY • 5 DECEMBER • 1030 • ROOM S320D

21st Century Learning

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

Cognitive Weaponry: Optimizing the Mind (19380)

JJ Walcutt, Ph.D.

Establishing Engaged Social Learning Communities: Formation and Sense Making (19326) ✈

Julian Stodd, Sea Salt Learning

Transforming the Operational Mindset: Self-regulating Cognitive Performance Enhancement Strategies (19310)

Denise Stevens, Heather Seiser, Karen Tovar, Christa Bohannon, Dennis Lyons, General Dynamics Information Technology

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ED6   THURSDAY • 5 DECEMBER • 1330 • ROOM S320D

Start Making Sense: Strengthing Interpersonal Communication

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

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

Kara Orvis, Jessica Shenberger-Trujillo, 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 Grabowecky, 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

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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 Roemerman, Eric Haney, Ph.D., Lone Star Analysis

Air Force Agile Development Methodology for Addressing Future Air Operations Capabilities (19268) ✈

Lillian Campbell-Wynn, Ph.D., AFAMS

Requirements Engineering Innovations for Agile-based Programs (19247)

Paul Butler, Bill Fetech, Devin Hobby, Amy Lim, MITRE Corporation; Cynthia Harrison, Barbara Pemberton, U.S. Army PEO STRI

Simulation

S1 TUESDAY • 3 DECEMBER • 1400 • ROOM S320B

Simulation Architectures

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

Assessing and Measuring Interoperability Between Multi-national Live Training Systems (19186)

James Benslay Jr., Greg Carrier, MITRE Corporation; LTC Rhea Pritchett, U.S. Army PEO STRI; W. Bogler, Combat Capabilities Development Center

Towards a Common Reference Architecture for Mission Training Through Distributed Simulation (19225) ✈

Tom van den Berg, Wim Huiskamp, TNO Defence Research

New Techniques for High-Fidelity Modeling and Simulation in 5G Mobile Network Environments (19322)

Steven Kropac, LGS Innovations, LLC; Jeff Weaver, SCALABLE Network Technologies

S2 TUESDAY • 3 DECEMBER • 1600 • ROOM S320B

Synthetic Terrain Environments

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

Enhancing Situational Awareness Anywhere in the World with Geospatially Accurate Scene Simulation Using Automated "Real World" Content Generation (19112)

Brian Miles, OSC; Thomas Creel; Kathy Wilder; Arthur Kenton; Mark Abrams, EGS

Reconfiguring Synthetic Environments as Inputs to Unity 3D (19277) ✈

Abhishek Verma, Triston Thorpe, Collins Aerospace

Geospecific 3D Terrain Data Optimization Solutions for Game and Simulation Engines (19368)

Lathin Liles, Jorge Ortiz, Chris Caruthers, GameSim

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 CCDC-SC STTC; Michael Proctor, CMSP, University of Central Florida; Deborah Burgess, The SALUD Group, Inc.

Adapting Existing Simulation Architectures to Enhance Tailored Instruction (19239)
Robert Sottilare, Alyssa Tanaka, Ross Hoehn, Soar Technology

Tactical Decision Kits for Infantry Training (19341)
Christopher Young, Lockheed Martin Rotary and Mission Systems; Richard Schaffer, Michael Longtin, Lockheed Martin; Brian Stensrud, Soar Technology; Marcus Mainz, United States Marine Corps

S5   WEDNESDAY • 4 DECEMBER • 1400 • ROOM S320B
Engineering Simulation Solutions
Session Chair: Christina Bouwens, Ph.D., University of Central Florida
Session Deputy: Klainie Nedoroscik, American Systems

Aimpoint Solutions on Complex Area Targets (19172)
Matthew McLaughlin, Fires Battle Lab

Cyber Model-based Engineering (MBE) (19254)
Ambrose Kam, Matthew Curreri, Lockheed Martin; Carl Hein, Michael Stebnisky, XSIM

Enhancing Wargaming Fidelity with Network Digital Twins (19269)
Jeff Hoyle, Dr. Rajive Bagrodia, Ha Duong, Jeff Weaver, Ung-Hee Lee, SCALABLE Network Technologies

S6   WEDNESDAY • 4 DECEMBER • 1600 • ROOM S320B
Improving Computer Generated Forces
Session Chair: Jimmy Moore, CMSP, PeopleTec
Session Deputy: Paul Andrzejewski, HigherEchelon

Demonstrating the Effects of Human Behavior in Simulation Using the RAND Will to Fight Model (19111)
Glenn Hodges, Ph.D., U.S. Army; Alfred Connable, Ph.D., Aaron Frank, Ph.D., Henry Hargrove, RAND

Reusability and Efficiency in Behaviour Modelling for Computer Generated Forces (19211) ✈
Joost van Oijen, Armon Toubman, Gerald Poppinga, Netherlands Aerospace Centre NLR

Exploring Game Industry Technological Solutions to Simulate Large-scale Autonomous Entities within a Virtual Battlespace (19328) ✈
Raymond New, Kyle McCullough, Noah Nam, Ryan McAlinden, University of Southern California Institute for Creative Technologies

S7   THURSDAY • 5 DECEMBER • 0830 • ROOM S320B
Advancing Virtual Reality and Training
Session Chair: Kenny Hebert, Quantum3D
Session Deputy: Monique Brisson, USAF AFRL

Designing Virtual Reality Tools: Making Simulated Interventions Feel and Act Like Their Real Counterparts (19190) ✈
Megan Smith, University of Regina; John Desnoyers-Stewart, Simon Fraser University; Gregory Kratzig, Royal Canadian Mounted Police

Toolset 3D Position Tracking For A Visio-Haptic Mixed Reality System (19279) ✈
Mehmet Aygun, Mehmet Nacar, Mehmet Guler, Eren Celk, Hulusi Baysal, Hacı Yuksel, Havelsan; Yigit Tascioglu, Tobb University of Economics & Technology

Utilizing Commodity Virtual Reality Devices for Multi-user Training Simulations (19361)
Jack Miller, Austin Hanus, Eliot Winer, Ph.D., Iowa State University

S8   THURSDAY • 5 DECEMBER • 1030 • ROOM S320B
Wargaming and Planning
Session Chair: John Huddlestone, 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

S9   THURSDAY • 5 DECEMBER • 1330 • ROOM S320B

Radio Frequencies

Session Chair: Nina Deibler, Serco, Inc.
Session Deputy: Eric Jarabak, PM TRASYS ENG

Jamming Techniques 2.0 (19224)

David Haber, Collins Aerospace; Patrick Merlet, Parsons Corporation; Charles Brooks, SRC Inc.

Radio Network Automation for Operational Testing: A Practical Resource for Radio Networks Planning (19366)

Carlos Leon-Barth, Patricia Wright, Athena-Tek; Thomas Mitro, AIT Engineering; Robert Cox, U.S. Army PEO STRI; Scott Nix, General Dynamics Mission Systems; Robert Carpenter, General Dynamics

Training

T1   TUESDAY • 3 DECEMBER • 1400 • ROOM S320F

Enhanced Add-ons: Stories and Games

Session Chair: Robert Wallace, USAF ACC 29TSS
Session Deputy: Chuck Wythe, Cape Henry Associates

Game-based Learning to Enhance Post-secondary Engineering Training Effectiveness (19139)

Kevin Hulme, Ph.D., CMSP, Aaron Estes, Mark Schiferle, Rachel Su Ann Lim, University at Buffalo

Revolutionizing Formal School Learning with Adaptive Training (19215)

Amanda Bond, Brian Stensrud, Soar Technology; Natalie Steinhauser, NAWCTSD; Jennifer Phillips, Cognitive Performance Group

Game On: Storytelling Narrative Applied to Simulator-based Training (19363)

Margaret Merkle, Tara Browne, Ph.D., USAF

T2   WEDNESDAY • 4 DECEMBER • 1030 • ROOM S320F

Tag You're It: Team Training & Oversight

Session Chair: Sean Carey, USAF HQ AMC
Session Deputy: Maureen Holbert, Booz Allen Hamilton

Enhancing Training of Supervisory Control Skills for Automated Systems (19120)

Natalie Drzymala, Natim Research; Thomas Graves, Army Research Institute; Tim Buehner, Natim Research; Steven Aude, ICF

The Development and Implementation of Speech Understanding for Medical Handoff Training (19235)

Alyssa Tanaka, Ph.D., Brian Stensrud, Ph.D., Soar Technology; Gregory Welch, Ph.D., Francisco Guido-Sanz, R.N., Ph.D., University of Central Florida; LCDR Lee Sciarini, Ph.D., Naval Survival Training Institute; CDR Henry Phillips, Ph.D., NAWCTSD

Training Teamwork Skills in an Intelligent Tutoring System (19276)

Robert McCormack, Ph.D., Tara Kilcullen, Alexander Wade, Tara Brown, Ph.D., Alexander Case, Dan Howard, Aptima, Inc.; Anne Sinatra, U.S. Army Combat Capabilities Development Command Soldier Center SFC Paul Ray Smith Simulation & Training Technology Center

T3   WEDNESDAY • 4 DECEMBER • 1400 • ROOM S320F

Training, Accelerated

Session Chair: Nick Giannias, CAE
Session Deputy: Stu Armstrong, Cole Engineering Services, Inc.

Simple to Complex – Evolution of Workforce Training in a Rapidly Changing Environment (19155)

Mike Thorpe, Serco, Inc.

Improving Assessments Using Intelligent Agents with Transient Emotional States (19251) ✈

Angie Dowdell, Army Research Institute, Columbus State University; Rania Hodhod, Columbus State University; Suleyman Pölat, University of North Texas; Randy Brou, Army Research Institute; Julia Grove, Consortium Research Fellows Program

Learning Next: Self-Improving Competency-based Training Rooted in Analytics (19302)

Jennifer Lewis, CMSP, Kathryn Thompson, Tobie Smith, SAIC

T4   THURSDAY • 5 DECEMBER • 1030 • ROOM S320F

Improving Training through Realistic Environments and Architectures

Session Chair: Thomas Yanoschik, CMSP, SAIC
Session Deputy: Capt J. Garrick Sheatzley, EWTGLANT M&S Officer

Impact of Malodors on Tourniquet Application: A Longitudual 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&T

Adaptive Network Planning for Infrastructure Networks for Test and Training Events (19337)

Rajive Bagrodia, Ph.D., Jeff Weaver, Wei Liu, Defeng Xu, SCALABLE Network Technologies; Gil Torres, Kent Pickett, TRMC S&T C4T; Jason Richardson, David McClung, U.S. Army Operational Test Command

Continuing Education Units: An I/ITSEC Opportunity

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

WHY SHOULD I EARN CEUs AT I/ITSEC?

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

WHAT SESSIONS ARE CEU-ELIGIBLE?

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

WHO MAY ATTEND THESE EVENTS?

- Tutorials and Professional Development Workshops are open to everyone. The Paper Sessions are limited to registered conference attendees.

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

HOW DO I RECEIVE CEUs AT I/ITSEC?

1. Be sure you are appropriately registered (you can confirm when you check in 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 or 407-882-0247 for additional information.

Continuous Learning Points (CLPs)

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

Certified Modeling and Simulation Professional
EVENTS AT I/ITSEC

STATE OF THE CMSP NATION MEETING
Wednesday, December 4, 1000 – 1100, Room S210D

Join the CMSP discussion with a newly formed CMSP 3.0 review committee.

CMSP WORKSHOP
Friday, December 6, 0800 – 1200 , Room S331A

This workshop describes the CMSP application, philosophy behind the exam and delves into sample exam questions.

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

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

CMSP
Certified Modeling & Simulation Professional

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 — **seating is limited**. If you wish to receive CEU credits, be sure to request CEUs during your conference registration. You may update your registration to include CEUs at any time at http://www.iitsec.org/attend/registration-fees
Lunch:	On own

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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
0900 – 1130	Break-out Sessions			Cyber Strategy and Policy
	Cyber Strategy and Policy			Human Aspects of Cybersecurity (HACS)
	Human Aspects of Cybersecurity (HACS)			Integrating Women & Underrepresented Communities into the Cyber Workforce
	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.

Certified Modeling & Simulation Professional (CMSP)

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

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

THE DISTINCTION OF A COMMITTED M&S PROFESSIONAL EARNING YOUR CMSP DESIGNATION DELIVERS:

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

Harnessing the Power of Data Analytics to Optimize Training

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

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

Live-Virtual-Constructive (LVC) Interoperability Techniques

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

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

Serious Game Design Workshop

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

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

Team and Collective Training Needs Analysis (TCTNA)

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

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

PROFESSIONAL DEVELOPMENT WORKSHOPS