CONTINUING EDUCATION UNITS: AN I/ITSEC OPPORTUNITY

Continuing Education Units (CEUs) 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 $50 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 Cori Best at cbest@NTSA.org or (703) 247-9487 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.

MONDAY, 2 DECEMBER

TUTORIAL GRID

ROOM	0830 – 1000	1030 – 1200	1245 – 1415
BEST TUTORIALS • CHAIR: LEE LACY, PH.D., CMSP, SOAR TECHNOLOGY, LLC			
330EF	Navigating the Generative AI Revolution 24T16	An Introduction to Cognitive Systems for Modeling & Simulation 24T21	Unleashing the Potential: Harnessing Large Language Models and Generative AI in Military and Industry Applications 24T26
TUT 1: M&S AND LVC BASICS • CHAIR: JOHN DIEM, TEXAS A&M / BUSH COMBAT DEVELOPMENT COMPLEX			
310AB	Introduction to Defense Modeling and Simulation 24T15	Live, Virtual and Constructive (LVC) Interoperability 101 24T40	A Process for Distributed LVC Integration and Execution 24T17
TUT 2: ALL ABOUT THE BASE-ICS • CHAIR: TARA KILCULLEN-OLIVA, ZYGOS CONSULTING			
310CD	Introduction to HLA 4 24T53	IEEE 1278™ Standard for Distributed Interactive Simulation (DIS): Concepts and Techniques 24T39	TENA: The Test and Training Enabling Architecture 24T27
TUT 3: DIGITAL ENGINEERING, DIGITAL TWINS, AND THE RETURN ON INVESTMENT • CHAIR: CHRIS MCGROARTY, U.S. ARMY DEVCOM SC STTC			
320A	Digital Engineering Basic Principles 24T33	Digital Twins: KISS 24T38	Simulated Systems – Real Return on Investment 24T51
TUT 4: IT STARTS WITH YOU (THE HUMAN) • CHAIR: KEVIN HULME, THE STEPHEN STILL INSTITUTE FOR SUSTAINABLE TRANSPORTATION AND LOGISTICS (SSISTL)			
320B	Harnessing Physiology for Peak Human Performance in Training and Simulation 24T43	Motion Sickness in Virtual Environments: Theory and Practical Considerations 24T29	Mitigation and Management of Minimize Cybersickness in the Design and Implementation of Learning Systems with Virtual Environments 24T36
TUT 5: LIFECYCLE OF M&S CONFIDENCE – FROM ACORN TO TREE • CHAIR: SIMONE YOUNGBLOOD, THE JOHNS HOPKINS UNIVERSITY APPLIED PHYSICS LABORATORY			
320C	Simulation Conceptual Modeling Theory and Use Cases 24T13	Making the Case: Building Strong Modeling and Simulation (M&S) Verification and Validation Evidence 24T46	Accreditation of Simulation-Based Experiments: Beyond the M&S 24T12
TUT 6: ACCESSIBILITY AND THE HUMAN ELEMENTS OF TRAINING • CHAIR: JEFFREY RAVER, SAIC			
320D	Remodeling Readiness: Making Sense of Jobs, Tasks, and Skills in a Digital World 24T25	Harnessing the Power of Simulation-Based Tools to Enhance Warfighter Brain Health 24T34	Spell Casting: Calling the Power of Accessible Design to Your Serious Games and Simulations 24T60
TUT 7: XR MR VR – GET REAL ^3 • CHAIR: STEVEN PARRISH, EDUCATION MANAGEMENT SOLUTIONS			
320E	Evolution of Radio Signal Visualization from Spectrum Analyzers to Mixed Reality 24T49	Accessible, Adaptable, Adoptable eXtended Reality (XR) Training – The Need is Now, Are You Ready? 24T45	Mission XRpossible: Navigating Novice-to-Expert Assessment Design in Medical & Military Training 24T31
TUT 8: NAVIGATING GLOBAL PARTNERSHIPS • CHAIR: NIR KEREN, IOWA STATE UNIVERSITY			
320F	Enhancing CBRN Response Readiness Using a Mental Model Matrix 24T62	The Development of a Resilient ADL Capacity Through Long Term Nordic Military Partnership 24T22	U.S. Export Controls, National Security, and the Simulation Industry in 2024 24T54
TUT 9: LAGNIAPPE • CHAIR: RONALD VENTURA-MOORE, MAXAR			
320G	Securing Distributed LVC: Harnessing OMG DDS for Interoperability at Scale 24T18	Introduction to Quantum Computing – It'll be Fine Man (Feynman) 24T19	How the Brain Creates Reality; Enhancing the Reality Experience with Large Area Haptic Feedback 24T61
TUT 10: AI & YOU • CHAIR: SCOTT HOOPER, BOHEMIA INTERACTIVE SIMULATIONS, INC.			
330GH	A Practitioner's Guide to Human-Machine Teaming Research 24T30	Applied Generative AI for 3D Simulation and Modeling Assets 24T48	Machine Learning: An Introduction for Humans 24T20

0830 – 1000

BEST TUTORIALS
0830 – 1000 • 330EF

NAVIGATING THE GENERATIVE AI REVOLUTION

24T16

There are plenty of books, articles, and workshops about Artificial Intelligence (AI) nowadays—some of which have no doubt been created by algorithms, such as ChatGPT. We've tried to approach this session a bit differently.

Our tutorial is quite human-centric. It's not a deep dive on software development or deep mathematics, nor is it another lazy walkthrough of "prompt engineering" recipes. Instead, we've approached Generative AI from a different lens, exploring the questions it raises about our structures and systems, ways of working, and the future of our communities. We've made the tutorial approachable and somewhat speculative, although grounded in science and technology as well as the authors' unique backgrounds in defense (Sae), organizational learning (Julian), and commercial entrepreneurship (Geoff).

Our tutorial includes several parts:

- We begin by reviewing the foundations, so that even those who've somehow avoided discussions of Generative AI can have a sense of what these algorithms can do and roughly how they work. This includes a no-nonsense overview of the relationships between Good Old-Fashioned AI, Machine Learning, Deep Learning, and Generative AI. It will also include a brief description of how Generative AI works.
- Next, we consider how the mirror held up by AI helps us see ourselves (as humans) in different ways, including our biases and baser natures and our concepts of intelligence and personhood. This section explores our very human responses to AI, including how real-world unfairness infects algorithms and how bad actors are using Generative AI.
- We then explore notions of change across art, culture, organizations, society, and security. How will these structures evolve as Generative AI grows more pervasive? Examples include structural changes to work, the ways we value and navigate information, new models of learning and assessment, and the increasing use of Augmented Intelligence (the pairing of humans with AI augmentation).
- Finally, we end with a practical discussion designed to guide attendees through thinking about different types of change (e.g., efficiencies gained within existing structures versus disruptive paradigmatic change that changes those structures all together). This section includes a focus on how Generative AI is likely to create change within their own organizations and communities and what they should be doing to influence and navigate these changes.

This is an exciting, if volatile new world, and perhaps, the ideas explored within this tutorial will help attendees find their ways a little bit better.

PRESENTERS
Sae Schatz, Ph.D., Partnership for Peace Consortium
Julian Stodd, Sea Salt Learning Ltd.
Geoff Stead, MyTutor

TUT 1: M&S AND LVC BASICS
0830 – 1000 • 310AB

INTRODUCTION TO DEFENSE MODELING AND SIMULATION

24T15

This tutorial will describe the fundamental technologies, terms and concepts associated with Defense Modeling and Simulation (M&S) as used in the U.S. Department of Defense (DoD) and in the larger Defense community. The tutorial will cover key M&S terms and concepts that describe M&S technology, development, and application. It will include: (a) M&S terminology and concepts; (b) M&S technology, architectures, and interoperability protocols; and (c) The processes for developing valid representations of: DoD warfighting capabilities, threat capabilities, complex systems, and mission environments. 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. The tutorial will highlight the role of Verification, Validation and Accreditation (VV&A) in ensuring credible models and simulations meet the needs of their users, the use of M&S standards, and the integration of M&S with DoD Mission Engineering and Digital Engineering in the development and acquisition of DoD warfighting capabilities. The tutorial will describe the characteristics and associated challenges of M&S application within DoD functional areas including Training, Analysis, Acquisition, Test and Evaluation, Planning, Medical, Mission Engineering, Autonomy, Artificial Intelligence, DoD Research and Development/Employment, and Intelligence. The tutorial will also identify accessible M&S information resources; U.S. Government/DoD, International, Academia, and Industry.

PRESENTERS
John Daly, Booz Allen Hamilton
James Coolahan, Ph.D., Coolahan Associates, LLC

TUT 2: ALL ABOUT THE BASE-ICS
0830 – 1000 • 310CD

INTRODUCTION TO HLA 4

24T53

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 shows how HLA can be used for LVC platform training, C2 training, analysis and wargaming

as well as space simulation. Several standardized Federation Object Models (FOMs) like the RPR FOM model for platform training, Link 11 and Link 16 FOMs, NATO FOM, Cyber DEM and Space FOM are also described.

After an overview of the technical features of HLA, the new version, HLA 4, is described. It adds new features in the area of scalability, security, cloud and live deployment. New features for extending FOMs are also presented. Additional considerations like gateways, tool chain, performance and implementation of Cross Domain Securiy are also covered.

This tutorial is intended for all audiences; however, some familiarity with basic principles of distributed computing is recommended.

PRESENTERS
Björn Moller, Pitch Technologies
Fredrik Antelius, Pitch Technologies

TUT 3: DIGITAL ENGINEERING, DIGITAL TWINS, AND THE RETURN ON INVESTMENT
0830 – 1000 • 320A

DIGITAL ENGINEERING BASIC PRINCIPLES

24T33

The Digital Engineering (DE) Basic Principles tutorial will provide an exclusive overview of foundational terms and concepts associated with DE development and application in the Department of Defense (DoD). During the session, attendees will become familiar with (a) DE terminology and concepts, (b) DE technology, architectures and standards and their role in enabling key functions, (c) the processes for developing valid models and simulations, or an "authoritative source of truth," that captures the current state and history of a system's technical baseline, and (d) the supporting DE ecosystem. Attendees will also be introduced to emerging DE methods in the DoD that support product development activities, including training development and delivery, organizational change management, DoD acquisition support, and other areas that directly support the Warfighter. Furthermore, this tutorial will identify key policies, procedures, and guidance, that emphasize the importance of Verification, Validation and Accreditation (VV&A) to ensure models meet user requirements, and the curation of those models may be trusted for use and reuse.

This tutorial will explore the characteristics and associated challenges of DE use in Test and Evaluation, Autonomy, Mission Engineering, DoD Research and Development/Acquisition and Manufacturing. It also highlights the key role DE plays in developing capabilities that support training, maintenance, and DoD operations. The tutorial will describe accessible DoD DE information resources and explain the role of the Office of the Under Secretary of Defense for Research and Engineering (OUSD (R&E)) and Modeling and Simulation (M&S) support to the engineering and acquisition Enterprise, which is the focal point of DoD DE and M&S information, practice, technology, and functional use.

The target audience for this tutorial are M&S professionals that work in various domains that may find utilization of their capability in another manner. Upon completion of this tutorial, the participant will better understand DE fundamentals that will contribute to their DE journey. Learners will further their knowledge of key terms and concepts and how they are being applied. The tutorial will also aid learners in driving DE principles and practices that will drive digital transformation initiatives within their own organizations.

PRESENTERS
Jeffrey Nartatez, OUSD (R&E) Digital Engineering Modeling & Simulation
Keith Henry, OUSD R&E Digital Engineering Modeling & Simulation
Scott Schutzmeister, Institute for Defense Analyses
Daniel Hettema, OUSD (R&E), DEM&S

TUT 4: IT STARTS WITH YOU (THE HUMAN)
0830 – 1000 • 320B

HARNESSING PHYSIOLOGY FOR PEAK HUMAN PERFORMANCE IN TRAINING AND SIMULATION

24T43

Hyper-realistic environments and on-demand training tools have experienced significant advancements in training and simulation use cases. Incorporating physiological monitoring into simulation and training environments provides crucial information to monitor and optimize performance, ensure individual competencies, provide adaptive support, and enable bi-directional communication between human users and AI collaborators. Training and simulation communities can remain at the forefront of innovation and assured deterrence by synergizing common needs and removing barriers to integrating human performance monitoring. The key to making these capabilities available to the community is streamlining an approach that is adaptive to a variety of use cases. Such an approach will support more advanced training environments, decision-making, and digital engineering to ensure readiness.

Attendees will be equipped with tools to understand and implement physiological monitoring, regardless of specific use cases. The session will provide engaging overviews of the current state-of-the-art in physiological monitoring and human performance, including use cases for training and simulation, current challenges, and example implementations. Attendees will learn best practices and a recommended approach to leverage physiological sensing in various environments. The approach will delve into understanding underlying physiological changes, selecting appropriate sensors, benchmarking to confirm accuracy, analyzing data, storing results, and translating data into action.

PRESENTERS
Emily Mills, Ph.D., Design Interactive, Inc.
Robert Furberg, Ph.D., JPEO-CBRND
Charles Rowan, Ph.D., The MOVES Institute, Naval Postgraduate School
Nina Fletcher, Ph.D., Design Interactive, Inc.
Rebecca Kwasinski, Design Interactive, Inc.
Victoria Olko, Design Interactive, Inc.

TUT 5: LIFECYCLE OF M&S CONFIDENCE — FROM ACORN TO TREE
0830 – 1000 • 320C

SIMULATION CONCEPTUAL MODELING THEORY AND USE CASES

24T13

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. It can bound the systems engineering problem and provide valuable artifacts for simulation validation, verification, and accreditation. The emergence of Model Based System Engineering (MBSE) has accentuated the need for well-formed simulation conceptual models.

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, Borah Enterprises LLC

TUT 6: ACCESSIBILITY AND THE HUMAN ELEMENTS OF TRAINING
0830 – 1000 • 320D

REMODELING READINESS: MAKING SENSE OF JOBS, TASKS, AND SKILLS IN A DIGITAL WORLD

24T25

Efficient and dynamic sustainment of force-wide training and readiness requires an organization to build and maintain digital representations of comprehensive personnel job requirements, training materials, performance criteria and expectations. These digital representations are used during the planning, development and tracking of both training and job performance, enabling real-time readiness computations and data-driven training effectiveness evaluations. Although the U.S. military has created numerous systems that seek to collect and maintain human performance data, a significant gap remains in the lack of shared digital expressions of readiness across the ecosystem. In this tutorial, we review and demonstrate techniques for implementing centralized, technical standards-based competency and skills frameworks using existing training materials, job descriptions, and performance criteria that can be leveraged for actionable insights across the full training and readiness lifecycle. Our "digitization" approach streamlines the framework construction process and has been implemented over numerous recent Navy, Army, and Air Force projects to convert legacy artifacts that describe human experience, capability, potential, and expectations into normalized digital frameworks that support analysis and tracking in a modern learning ecosystem. We demonstrate how our semi-automated digitization techniques could be applied to all available data that defines what personnel should know and do within a military organization, including (1) who a person is and their training background; (2) the job duties associated with a person's role and assignments; (3) what a person has demonstrated they know and can do; (4) what credentials a person has earned; and (5) what a person's capabilities and goals are according to their organization. We use a civilian/military medical simulation use case to illustrate how competency frameworks have been and would be employed for team and individual performance analysis, skills gap analysis, training needs analysis, instructional design, assessment, and evaluation. This tutorial provides insights into machine actionable URI-referenceable data known as Linked Data, discusses approaches for applying appropriate security measures based on the information it represents, and reviews how the use of linked data has allowed systems to perform rapid analysis by uniformly following data trails across the system, organizational, and authoritative boundaries. The tutorial concludes with a discussion of how taking steps to "digitize" knowledge, skills, tasks and duties can provide organizations with a foundation focused on the human element of training and readiness, enabling a data-driven accelerator for sustaining a global force in a digital world.

PRESENTERS
Evelyn Rowland, Eduworks Corporation
Debbie Brown, Eduworks Corporation
Tim Welch, Eduworks Corporation
Brooke Shields, Eduworks Corporation

TUT 7: XR MR VR - GET REAL ^3
0830 – 1000 • 320E

EVOLUTION OF RADIO SIGNAL VISUALIZATION FROM SPECTRUM ANALYZERS TO MIXED REALITY

24T49

We are surrounded by invisible radio frequency signals used for communications, navigation, and even health. Traditionally, we see these signals through spectrum analyzers. However, the capabilities of existing analysis tools are being outpaced by the rapid modernization of wireless networks and topologies like 5G, IoT, Bluetooth, LoRa, Starlink, etc. RF is inherently multidimensional, but conventional analyzers display signals in 2D slices, limiting real-world applicability to highly technical users. Emerging technology that combines Mixed Reality displays and AI/ML algorithms is now capable of spatializing radio emissions at their natural 3D location for easier understanding and communication.

This tutorial will convey the evolution of RF visualization tools from flat interfaces to immersive ones that can be used to discover and map RF signals and networks. The audience will gain a broad understanding of the emergence of holographic interfaces and how they can be applied successfully to spatial data visualization. Building upon proven UI/UX principles, we will walk participants through challenges with the design and development process, theory behind decisions, and usability issues to overcome in actual deployments. Resulting best practices will be shared openly. Finally, the audience will learn about future applications of these tools and upcoming innovations in the emerging field.

PRESENTERS
Jad Meouchy, BadVR
Suzanne Borders, BadVR

TUT 8: NAVIGATING GLOBAL PARTNERSHIPS
0830 – 1000 • 320F

ENHANCING CBRN RESPONSE READINESS USING A MENTAL MODEL MATRIX

24T62

Addressing chemical, biological, radiological, and nuclear (CBRN) threats effectively is critical for military and emergency response teams. These incidents, characterized by their complexity and infrequency, pose a unique challenge in preparing responders to act decisively and effectively. Traditional training methods may not fully encapsulate the unpredictable nature of CBRN events, leading to gaps in the mental models that responders develop to navigate these threats. In response to this challenge, this workshop introduces an innovative approach, rooted in advanced research, aimed at analyzing and enhancing the cognitive strategies responders employ when facing CBRN threats. Central to this approach is the introduction of the Expected Mental Model State (EMMS) Diagnostic Matrix, an analytical tool that captures the ideal cognitive frameworks based on established military doctrines or emergency response protocols. This matrix serves as a framework for developing evaluative instruments, such as simulations or structured surveys, to assess an individual's mental model, which are the cognitive depictions formed through lived experiences and previous instruction.

Participants in this workshop will be engaged in a blend of theoretical and practical discussion, aimed at illustrating the utility of this framework in developing targeted and robust simulation exercises and surveys mapped directly back to the original EMMS. Using case studies from existing research with responders and radiological threats, the audience will see how the matrix can highlight gaps and trends in the mental models of individuals and groups. These case studies will serve as a basis for group discussions, enabling participants to how these insights can be leveraged to refine current training modules and inform the development of new training methodologies to bridge identified gaps. Further, participants will consider how this framework could be applied specifically to CBRN response scenarios to identify and characterize the mental models of military personnel.

Integrating military doctrine into the formulation of the EMMS and the derivative diagnostic matrix, this workshop directly addresses the intricate requirements of military preparedness for CBRN incidents. Using this innovative approach to assessing response personnel, training resources can be targeted, and solutions can be developed to complete the identified gaps or misconceptions. This methodical approach aims to ensure that response teams possess a thorough understanding and enhanced readiness, equipping them to effectively navigate the complexities of CBRN response.

PRESENTERS
Angela Leek, Ph.D., Summit Exercises and Training, LLC and Iowa State University
Jeff Skinner, M.D., Summit Exercises and Training, LLC
Nir Keren, Ph.D., Iowa State University

TUT 9: LAGNIAPPE
0830 – 1000 • 320G

SECURING DISTRIBUTED LVC: HARNESSING OMG DDS FOR INTEROPERABILITY AT SCALE

24T18

In today's dynamic landscape of distributed simulation, ensuring both interoperability and security are paramount challenges. Traditional simulation environments, often utilizing disparate standards, must seamlessly integrate with modern architectures leveraging cloud-based assets. Moreover, the escalating demand for security mandates integrators to navigate the complex realm of information assurance. How can simulation systems integrators navigate this intricate terrain and accelerate integration timelines to meet demanding requirements?

This tutorial offers a comprehensive exploration of the Object Management Group's Data Distribution Service (OMG DDS) standard, showcasing its pivotal role in addressing the twin imperatives of interoperability and security within distributed Live, Virtual, and Constructive (LVC) simulation environments. OMG DDS stands as a cornerstone middleware solution, adept at facilitating hard real-time data distribution across diverse systems while providing robust security mechanisms to safeguard sensitive simulation data.

Throughout the tutorial, participants will embark on a journey through the fundamental principles of OMG DDS, starting with its configuration for seamless integration with LVC simulations. From designing OMG DDS entities and data models to fine-tuning performance and scalability through a suite of quality-of-service parameters, attendees will gain actionable insights into harnessing OMG DDS's capabilities to meet the diverse needs of distributed simulation environments.

A focal point of the tutorial will be an in-depth exploration of OMG DDS's security features, used for multi-layered security (MLS) within LVC systems today. OMG DDS ensures the confidentiality, integrity, and availability of simulation data, essential for safeguarding against unauthorized access and malicious threats. Furthermore, attendees will discover how the OMG DDS Security standard enables secure interoperability with real-world systems already leveraging OMG DDS, facilitating seamless communication across disparate simulation environments.

The tutorial will culminate in an exploration of examples of integrating OMG DDS with existing simulation standards, and object/data models. Participants will unlock the potential for enhanced interoperability and scalability while maintaining robust security protocols.

Join us for this tutorial to gain actionable insights into leveraging OMG DDS for secure, reliable, and interoperable data distribution in distributed LVC simulations. Whether you're a seasoned simulation systems integrator or an industry newcomer, this session promises to equip you with the knowledge and tools needed to navigate the complexities of distributed simulation environments with confidence and proficiency.

PRESENTERS
Robert Proctor, Jr., Real-Time Innovations
David Whitten, Real-Time Innovations

TUT 10: AI & YOU
0830 – 1000 • 330GH

A PRACTITIONER'S GUIDE TO HUMAN-MACHINE TEAMING RESEARCH

24T30

Human-Machine Team (HMT) research represents one of the fastest growing fields of inquiry in science and technology. The need for HMT research is accelerated by warfare requirements, the AI revolution, and technological advances yielding a wide variety of collaborative automated platforms to support Warfighters' and operators' decision-making in current and future warfare paradigms. However, there is a sizable confusion on what are the main factors and approaches for investigating HMTs to produce effective systems. Additionally, without referencing the vast existing knowledge of what makes human teams perform effectively and applying those lessons to HMTs, we risk reinventing the wheel, or worse, we risk neglecting human factors considerations, thereby leading to infamous "human error" outcomes and poor acceptance of HMT technologies.

The purpose of this tutorial is to provide HMT stakeholders, whether they be scientists, engineers, or decision-makers, with a practical guide to address HMT science and technology holistically. The goal of this tutorial is to present logically and simply the most salient aspects of HMT research for stakeholders to develop a robust understanding of HMT research and its desired impact on the development of HMT technologies that support and extend Warfighters' capabilities.

The tutorial begins by providing contextual and historical background on HMTs, pointing to a rapid paradigm shift where perceptions of machines evolved from simple subordinates with precise tasking, to collaborative synthetic teammates supporting decision-making processes and autonomously carrying out mission objectives. We illustrate how this accelerated shift is driven by the AI revolution, future warfare demands, and modern mythology. Next, we provide an overview of how this shift also impacts Level of Automation (LOA) taxonomies in terms of requiring additional definition for collaborative human-machine decision-making, while providing practical examples.

Our focus turns to HMT research, and the need to align to DoD priorities. To that end, we first introduce the automation vision from the DoD Communities of Interest (COI). Second, we outline HMT research gaps and roadmaps from a seminal consensus study. And finally, we introduce how AI-driven automation needs to follow risk management best practices as well as DoD ethical principles for developing responsible AI.

Finally, the tutorial addresses important HMT performance enablers, focusing on three main enablers: calibrated trust, team situation awareness, and adaptive Human-Machine Interfaces (HMI). Our conclusion will summarize the tutorial's main points under the lens of conducting effective HMT research while providing useful resources to the practitioner in support of that endeavor.

PRESENTER
Sandro Scielzo, Ph.D., CAE USA

1030 – 1200
BEST TUTORIALS
1030 – 1200 • 330EF

AN INTRODUCTION TO COGNITIVE SYSTEMS FOR MODELING & SIMULATION

24T21

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 Jones, Ph.D., CMSP, Soar Technology, LLC
Dylan Schmorrow, Ph.D., Soar Technology, LLC

TUT 1: M&S AND LVC BASICS
1030 – 1200 • 310AB

LIVE, VIRTUAL AND CONSTRUCTIVE (LVC) INTEROPERABILITY 101

24T40

The purpose of this tutorial is to provide managers the necessary insight needed to support intelligent decision making when employing LVC to solve their needs. The tutorial will discuss the various solutions and domains of the technology and how it can potentially support 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, Trideum Corporation
Damon Curry, Pitch Technologies US

TUT 2: ALL ABOUT THE BASE-ICS
1030 – 1200 • 310CD

IEEE 1278™ STANDARD FOR DISTRIBUTED INTERACTIVE SIMULATION (DIS): CONCEPTS AND TECHNIQUES

24T39

As any gamer will tell you, it is compelling to connect simulations and play with other actual human participants, whether in the next room or on the next continent. Distributed Interactive Simulation (DIS) is an enabling technology that connects military training and engineering simulations for that purpose.

Successful research in the 1980s led to an international effort to standardize a network protocol for linking military training and engineering simulations. DIS was the result, using the IEEE standards process to create a technically sound and widely accepted protocol. IEEE 1278TM-1995 and additions in 1998 were the first full DIS standards that contained the protocol and rules for real-time simulation interoperability of military land, sea, and air platforms, weapon interactions, radar, radio, IFF, laser designators, underwater acoustics, logistics, simulation management functions, and more.

The success of DIS expanded into the Simulation Interoperability Standards Organization (SISO) in 1996. SISO took over the development of the DIS standard and launched a much wider range of simulation standards. The 2000s saw the development of the next round of improvements, resulting in IEEE 1278.1™-2012. Continuing development within SISO is working toward the next version, referred to as Version 8, expected to be completed in the mid-2020s.

This tutorial explains how DIS achieves real-time high-fidelity interoperability over best-effort networks. The basic concept and some of the technical details will be introduced to give students a foundation for starting and expanding the implementation and use DIS in their simulations. The standards process, history, and future directions of DIS are also presented. Emphasis on DIS Version 8 will review current developments and upcoming improvements to the DIS standard.

PRESENTERS
Robert Murray, SimPhonics, Inc.
Lance Call, AFRL

TUT 3: DIGITAL ENGINEERING, DIGITAL TWINS, AND THE RETURN ON INVESTMENT
1030 – 1200 • 320A

DIGITAL TWINS: KISS

24T38

Our objective is to leverage our extensive experience in digital twins across diverse private sector domains, including AEC, manufacturing, security, retail, and entertainment, to elucidate the multifaceted nature and potential applications of digital twins. To achieve this, our initial focus is on establishing a shared language, providing precise definitions, and categorizing the various levels and types of digital twins within the private sector. This foundational understanding will empower our audience to discern private sector solutions and how they may fit DoD needs.

The intricate landscape of digital twins encompasses varied types and levels, ranging from visual and maintenance-centric to those with IoT integrations facilitating rapid decision-making, and others designed explicitly for modeling, simulations, and predictive analysis. Following this comprehensive categorization in the initial section, our presentation proceeds to offer a high level overview of the intricate process involved in constructing digital twins. This section is intended to be a short and visual centric overview of how digital twins are built.

Subsequently, our presentation delves into a nuanced exploration of the evolving technologies integrated into digital twins. This segment aims to provide a deeper understanding of the technological foundations that underpin the diverse functionalities of digital twins.

Armed with a shared language, knowledge of the construction process, and insights into technological intricacies, we transition to demonstrating the potential applications of these solutions within the DoD, particularly in the realms of training and simulation.

In addressing potential concerns regarding the integration of digital twins in a DoD context, we proactively discuss best practices and industry standards observed in the private sector. By showcasing how these tools have been effectively leveraged alongside the regulatory frameworks governing them, we seek to instill confidence and understanding, laying the groundwork for the strategic incorporation of digital twins within defense operations.

PRESENTERS
John Niles, Gafcon Digital
Brett Moushon, TransformXD
Chris Hussey, TransformXD
Ryan Thomas, Allen3D

TUT 4: IT STARTS WITH YOU (THE HUMAN)
1030 – 1200 • 320B

MOTION SICKNESS IN VIRTUAL ENVIRONMENTS: THEORY AND PRACTICAL CONSIDERATIONS

24T29

Virtual Reality (VR) and simulation technologies are essential tools for training, education, research, healthcare, and entertainment, in military and civilian applications. With an estimated market value of 105.9B USD in 2030 and more than 171 million current users worldwide, VR technologies will have a major impact on our daily lives. Although VR and simulation technologies have improved significantly since they were first introduced, motion sickness is still a common side-effect for many users of VR and simulation technologies, resulting in various symptoms that can include nausea, dizziness, fatigue, headache, and eyestrain. As these symptoms are primarily caused by stimulation of the visual system while physical movement is typically limited (or fully absent), the term visually induced motion sickness (VIMS) has been used to describe motion sickness-like feelings in virtual environments (VEs). The occurrence of VIMS can cause users to stop VR or simulation sessions prematurely, with dropout rates being as high as 70% in some cases, posing a major problem for the training of military or civilian personnel that needs to be urgently addressed.

The goal of the present tutorial is to provide attendees with a systematic overview of the topic of VIMS while providing practical considerations when using or designing VEs. To achieve this, the tutorial is segmented into 5 parts. We will first introduce the attendees to the different theoretical foundations of VIMS (Part I) and discuss the role of different factors determining an individual's susceptibility to VIMS (Part II). Next, the tutorial will provide recommendations for measuring the severity of VIMS during and after VE exposure (Part III). An overview of the most effective countermeasures against VIMS will be provided (Part IV) before future research directions and open questions will be highlighted (Part V). Importantly, this tutorial is designed to provide helpful considerations and recommendations for users and designers of virtual environments (VR/AR applications, simulators). This tutorial does not require any existing knowledge on the topic of VIMS and is suitable for novice and expert users alike.

PRESENTERS

Behrang Keshavarz, Ph.D., University Health Network – KITE
Bruce Haycock, Ph.D., University Health Network – KITE

TUT 5: LIFECYCLE OF M&S CONFIDENCE — FROM ACORN TO TREE
1030 – 1200 • 320C

MAKING THE CASE: BUILDING STRONG MODELING AND SIMULATION (M&S) VERIFICATION AND VALIDATION EVIDENCE

24T46

The processes of Verification and Validation, are foundational elements that underlie assessments of M&S credibility. Verification and Validation (V&V) activities serve to build an evidentiary chain of information upon which M&S Users and Accreditation Agents can assess the viability of an M&S for a particular application. Information derived from the V&V processes is used to shape the understanding of the conditions under which an M&S could and should be used.

While V&V is founded on basic software engineering principles, implementation is often constrained by resources, whether these resources be time, money, personnel, or information. This tutorial will address the key steps that can be taken to build strong V&V evidence while accounting for resource impacts. The tutorial will incorporate lessons learned derived from multiple V&V applications.

Topics to be covered by this tutorial will include:

- Requirements traceability that provides the link between requirements and V&V testing
- Identifying verification test strategies (e.g., leveraging information, supplemental test activities) and adapting them to various development paradigms
- Building and applying validation referent data (what the simulation results will be compared to)
- Defining the simulation measures and metrics to be compared
- Selecting validation methods to apply when performing the results/referent comparison
- Documentation templates and tools that provide efficiency of process to the V&V effort
- V&V as it applies to other A's: Agile and Autonomous

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

PRESENTERS

Simone Youngblood, The Johns Hopkins University Applied Physics Laboratory
Katherine Ruben, The Johns Hopkins University Applied Physics Laboratory

TUT 6: ACCESSIBILITY AND THE HUMAN ELEMENTS OF TRAINING
1030 – 1200 • 320D

HARNESSING THE POWER OF SIMULATION-BASED TOOLS TO ENHANCE WARFIGHTER BRAIN HEALTH

24T34

The integration of operational and medical communities in a unified approach for optimizing Warfighter brain health while also preventing, diagnosing, and treating traumatic brain injuries (TBIs) poses a unique opportunity for merging the worlds of simulation and healthcare. Specifically, the merging of these two worlds could produce assessments, interventions, and trainings with high levels of ecological validity while also facilitating adaptive neuroplasticity for enhancing Warfighter brain health. This tutorial is intended to introduce simulation professionals to the future opportunities related Warfighter brain health and promote

the development of new technology for optimizing performance. We will cover key concepts relating to the prevalence, symptoms, and diagnosis of TBI as well as review longstanding issues related to the assessment and treatment of service members after a TBI. We will then discuss how to measure cognitive function and improvement with commonly utilized TBI outcome measures that are seen in current simulation technology. With overviews from eye tracking, electroencephalographic (EEG), and behavioral studies we will discuss similarities and differences in measuring cognition with TBI and healthy controls that may influence outcomes within simulation-based platforms. Finally, we explore the need and opportunities to scale current simulation tools for healthcare application to harness the possibilities for enhancing cognition and mitigating the effects of TBI as a possible deterrent to the Warfighter.

The tutorial has four major sections:

- Overview of the Department of Defense (DoD) Brain Health Initiative.
- Current limitations in cognitive performance assessment and training.
- Facilitating neuroplasticity through simulation-based tools for optimizing cognitive performance and Warfighter readiness.
- Future healthcare applications of simulation-based tools to support Warfighter brain health.

PRESENTERS

DeAnna Pinnow, DHA Traumatic Brain Injury Center of Excellence
Jamie Hershaw, DHA Traumatic Brain Injury Center of Excellence

TUT 7: XR MR VR - GET REAL ^3
1030 – 1200 • 320E

ACCESSIBLE, ADAPTABLE, ADOPTABLE EXTENDED REALITY (XR) TRAINING – THE NEED IS NOW, ARE YOU READY?

24T45

Training is often consumed in the classroom or remotely as a one size fits all structure with limited opportunity and/or costly simulations to practice hands-on skills in contextualized situations. The ability to practice skills contextually and obtain feedback to instill muscle memory, embody actions, and formulate critical thinking is needed now to assure deterrence and readiness in highly contested environments. By utilizing an integrated training approach of augmented, virtual, and mixed reality technologies, eXtended Reality (XR) can provide a contextualized virtual environment (which links the learning of foundational skills to practical scenarios and operational stressors) with augmented overlays and real-world objects (to scaffold instruction via multimodal cues tied to the real-world) to create a fully immersive and highly engaging training environment that fosters force readiness. When XR training applications are coupled with automated content generation and computer vision models that facilitate automated detection, tracking, and analysis an opportunity exists to provide psychomotor practice and validation in a highly engaging environment leading to significant proficiency gains in both primary and refresher training.

XR training applications must be accessible, adaptable, and adoptable. It is crucial when developing XR training solutions to evaluate the utility of the novel contextually based design elements and embodied interactions afforded by XR. XR does not have a proven, common mental map for the way users expect to interact with XR content especially when spatial movement is required. It is critical to build systems with interaction capabilities that optimize users' expected interaction paradigm. Applications downloaded to mobile or head worn devices enable readily available consumption and action-oriented, learner-centered solutions that are very different from traditional classroom and remote training.

This Emerging and Innovative Concepts tutorial will dive into the key elements of XR immersive training leveraging andragogically-based activities, formative assessments, feedback measures, and documentation ingestion to infer trainee proficiency by providing insights into: Key drivers and barriers of accessible, adaptive, and adoptable XR training; methodologies and strategies for creating accessible, adaptable, and adoptable XR training; value-added case studies with end-user feedback; and user-centered guidelines for designing, developing and implementing XR training systems. By the end of this tutorial, attendees will be able to implement effective techniques for developing and implementing accessible, adaptable, and adoptable XR training applications based on experience and lessons learned from military ground operations, maintenance, and medical domains.

PRESENTERS

JoAnn Archer, Design Interactive, Inc.
Rebecca Kwasinski, Design Interactive, Inc.
Glenn Dennison, DAF, AETC, 338 TRS/TRR

TUT 8: NAVIGATING GLOBAL PARTNERSHIPS
1030 – 1200 • 320F

THE DEVELOPMENT OF A RESILIENT ADL CAPACITY THROUGH LONG TERM NORDIC MILITARY PARTNERSHIP

24T22

Advanced Distributed Learning (ADL) has become central to modern military training methodologies. The Nordic countries (Denmark, Finland, Norway, and Sweden) have capitalized on this trend through extensive cooperation under the NORDEFCO (Nordic Defence Cooperation) framework. This collaboration encompasses several key areas:

- The NORDEFCO ADL Forum of Experts provides a platform for strategic coordination, knowledge exchange, and resource sharing.
- Annual NORDEFCO ADL Conferences facilitate networking, presentations on best practices, and discussions on emerging technologies.
- Joint projects, ranging from shared technology development to the creation of standardized training modules, promote efficiency and interoperability.

This cooperation has yielded significant benefits for Nordic militaries since the early 2000s. Cost savings are achieved through reduced duplication, while knowledge exchange accelerates the adoption of effective ADL strategies. Joint projects directly enhance operational readiness by deliv-

ering flexible and accessible training. These collaborative efforts position the Nordic countries as leaders in military ADL, promoting innovation and ensuring a technologically advanced and adaptable defence forces.

This tutorial will tell the story of this collaboration effort and give a breakdown of the history and timeline, methods of cooperation, the benefits of Nordic ADL cooperation and highlight specific projects that have been instrumental in employing ADL to bolster readiness in the Nordic armed forces.

PRESENTERS
Geir Belgen Isaksen, Norwegian Defence University College
Ville Kostian, The Finnish Defence Forces Shared Services Centre
Steffen Waedeled-Moeller, Royal Danish Defence College
Michael Thorsen, Royal Danish Defence College
Major Niclas Ljung, Military Academy, Swedish Armed Forces
Major Tohmas Ax, Military Academy, Swedish Armed Forces

TUT 9: LAGNIAPPE
1030 – 1200 • 320G

INTRODUCTION TO QUANTUM COMPUTING – IT'LL BE FINE MAN (FEYNMAN)

24T19

The mystery and excitement surrounding quantum computing (QC) is on par with AI and machine learning. In fact, some believe QC is the future of machine learning, i.e., quantum machine learning (QML). In this tutorial, we will identify concepts of quantum mechanics that apply to QC. We present quantum computer state of the art and corresponding challenges. Fundamental and relevant QC concepts such as qubits, superposition, entanglement, and interference will be presented. Applications to cryptography and teleportation will show the relevance of today's QC. We will introduce the quantum Fourier transform and quantum optimization and explain why QC is believed to be the future of QML. We will also challenge some popular QC myths, particularly the claim QC will render the classical binary computer obsolete. This tutorial has three major sections:

(1) Single qubits, where the qubit is introduced, the concept of superposition is explained including graphical representations, and single-qubit operators (gates) are introduced; concluding with a quantum cryptography example which combines the concepts learned so far.
(2) Multiple qubits, where multi-qubit operators (gates) are introduced along with the concepts of entanglement and interference, concluding with a quantum teleportation example demonstrating newly learned concepts.
(3) An introduction to the quantum Fourier transform (QFT) and how Shor's algorithm breaks RSA encryption; and introduce quantum optimization with its implications for QML.

The tutorial finishes with where to find more information on various topics, a reference list, and time for questions and answers.

PRESENTER
Randal Allen, Ph.D., CMSP, Lone Star Analysis

TUT 10: AI & YOU
1030 – 1200 • 330GH

APPLIED GENERATIVE AI FOR 3D SIMULATION AND MODELING ASSETS

24T48

Simulation environments, virtual and otherwise, are often bottlenecked by laborious art design, graphical modeling, and data integration. This asset development pipeline is slow and costly, requiring specialized labor that can complicate the logistics or expose the operational security of a training system. However, the emerging field of generative AI allows one individual to direct a single secure computer to build libraries of relevant, usable materials through simple voice or text prompts. Once these processes have fully matured, the net increase in productivity will likely be measured in orders of magnitude.

This tutorial will review and critically analyze modern modeling and simulation production workflows against the next-generation approach of directed GenAI, exploring possible trajectories of highly disruptive new tech. The audience will gain a deep understanding of the current generative AI methodologies with a particular emphasis on applied utility rather than theoretical potential. Together, we will walk through common simulation challenges and dissect the corresponding AI prompts that generate passable solutions within seconds or minutes. The audience will learn how to begin testing these new tools and be given recommendations on how to use them effectively and responsibly.

PRESENTERS
Jad Meouchy, BadVR
Suzanne Borders, BadVR

1245 – 1415

BEST TUTORIALS
1245 – 1415 • 330EF

UNLEASHING THE POTENTIAL: HARNESSING LARGE LANGUAGE MODELS AND GENERATIVE AI IN MILITARY AND INDUSTRY APPLICATIONS

24T26

This tutorial aims to explore the art and science behind utilizing Large Language Models (LLMs) and Generative AI in military and industry environments. From understanding the nuances of selecting the right LLM to crafting sophisticated prompts and overcoming implementation challenges, this tutorial provides participants with basic understanding of essential skills necessary for harnessing the power of LLMs effectively.

We will delve into LLM solutions, analyzing selection criteria and weighing various options' pros and cons. Understanding hardware and software requirements, including integrating LLM APIs, is crucial for seamless implementation. The tutorial progresses into product item creation, explaining steps to determine data requirements, define product items, and enrich prompts with relevant data. Participants will learn about writing effective prompts, from basic structures to advanced techniques like Chain-of-Thought (CoT) prompts and LLM-assisted prompt refinement. Supplementing prompts with external data sources

and understanding Retrieval-Augmented Generation (RAG) strategies are also covered in order to enrich participants' knowledge base. We will cover techniques for data generation, validation, and batch processing to ensure AI-generated content quality and efficiency. The tutorial emphasizes measuring effectiveness and utilizing real-world operational data to improve AI system quality and transparency.

We will cover advanced techniques like RAG and CoT prompting that significantly enhance generative AI capabilities in training development. RAG combines large language models with dynamic retrieval and incorporation of external information into responses, while CoT Prompting structures prompts to guide AI through logical reasoning steps, particularly effective in complex problem-solving scenarios.

Real-world use cases illustrate LLMs' practical applications in military and industry settings, addressing military training analysis and design challenges and enhancing proposal development processes. Through these use cases, participants will gain insights into diverse LLM/AI applications.

Finally, the tutorial addresses integrating generative AI into military training environments, acknowledging potential operational efficiency enhancements while confronting challenges such as classified environments, data security and organizational change management.

PRESENTERS
Ramona Shires, ND, Aptima, Inc.
Robert McCormack, Ph.D., Aptima, Inc.

TUT 1: M&S AND LVC BASICS
1245 – 1415 • 310AB

A PROCESS FOR DISTRIBUTED LVC INTEGRATION AND EXECUTION

24T17

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 Distributed Simulation Engineering and Execution Process (DSEEP) standard (IEEE Std 1730-2010) describes a process model for developing an event. DSEEP defines a set of seven steps divided into activities and provides representative inputs and outputs for each activity. However, the user still must instantiate the process and develop artifact templates. The development of a robust process based on DSEEP is a substantial effort.

An instantiation of DSEEP was developed based on the authors' integration and execution of many distributed LVC events. This implementation has nine steps, divided into 27 activities. This process adds two additional steps to DSEEP. One of these new steps adds tabletop wargaming to work through event requirements. The second additional step develops a digital twin of the target system. A detailed set of processes, templates, and guidance on how to perform the selected activities is provided. The process covers the integration of simulations and tactical systems to meet the objectives of the LVC event.

The goal of a Process for Distributed LVC Integration and Execution is to produce a verified distributed LVC environment to conduct an event. While distributed LVC environments can be created without using a process, not using a process adds risks to execution and analysis. The first risk is that the integration fails, and it may be difficult to discover the reason. The second risk is that the unverified environment produces invalid results that might not be apparent until the results are used.

The tutorial will provide an overview of the complete process and describes selected steps in more detail. This will provide the detailed inputs, tasks, outputs, and examples for each activity in the step. The process includes issues related to distributed LVC environments using multiple distributed simulation architectures, live entities, and cyber.

The process described in this tutorial was developed to support distributed LVC Test and Evaluation. However, the process applies to research and development, training, and experimentation. 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
Roy Zinser, Trideum Corporation
Kenneth LeSueur, Ph.D., Trideum Corporation
Tilghman Turner, ATEC Redstone Test Center
LTC John Furr, USA, U.S. Army Futures Command
Simon Goerger, Trideum Corporation
Ed Lerz, Huntington Ingalls Industries

TUT 2: ALL ABOUT THE BASE-ICS
1245 – 1415 • 310CD

TENA: THE TEST AND TRAINING ENABLING ARCHITECTURE

24T27

The Test and Training Enabling Architecture (TENA) provides an advanced set of interoperability software, interfaces, and connectivity for use in joint distributed testing and training. This tutorial will discuss 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, gateways, and data management capabilities assist in creating and managing an integration of range resources. This tutorial will describe the elements of TENA in general and then take a deeper dive into how to use TENA with specific emphasis on the new and improved standard object models designed to bridge the gap between live systems and virtual and constructive simulations.

PRESENTER
Edward Powell, Ph.D., Ed Powell Consulting

TUT 3: DIGITAL ENGINEERING, DIGITAL TWINS, AND THE RETURN ON INVESTMENT
1245 – 1415 • 320A

SIMULATED SYSTEMS – REAL RETURN ON INVESTMENT

24T51

When requirements increase faster than available resources, decisions on how to allocate the resources among various programs and projects are required. Project and program managers must show why their systems are worthy of continuing and how they are adding deterrance through integrated training and readiness. While many factors influence these important decisions, return on investment (ROI) should play a key role. ROI has been an essential factor for many years, however, lately we have seen many instances where the term is used incorrectly. For example, "The use of System X saved 23% of classroom hours," is not ROI. Furthermore, traditional ROI requires a return or revenue stream to calculate the benefit of the investment. However, in military applications there is most likely not a revenue stream. How does one then calculate the return?

This tutorial builds on a study performed for the Modeling and Simulation Coordination Office in 2009 and published in the Acquisition Review Journal in 2011. In the tutorial, attendees will be presented the definition of ROI, some examples of ROI and some examples of the incorrect use of ROI. Then some of the unique challenges to the DoD relative to the M&S environment will be presented with the proposed solutions from the study discussed. In that discussion, how to construct solid usable metrics for use in the ROI calculation for M&S will be presented with real-world examples given. Additionally, an examination of how ROI can differ depending upon your point of view (management, program, or system level) and what things are considered in the calculation. Finally, examples that put all the ideas together and show ROI in some different scenarios will be presented and discussed. The end-goal is that each attendee will come away with an understanding of how best effect ROI use as well as how it can be misapplied; how to calculate it and the unique challenges that arise when there is no revenue stream; how to overcome those challenges and develop measurable metrics for use in the ROI calculation; and finally, how all of the principles come together in detailed examples and how the appearance of ROI may differ depending upon your management level. Using these methods, attendees will walk away with being better able to defend their M&S programs and projects against the ever-present funding axe.

PRESENTERS

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

TUT 4: IT STARTS WITH YOU (THE HUMAN)
1245 – 1415 • 320B

MITIGATION AND MANAGEMENT OF MINIMIZE CYBERSICKNESS IN THE DESIGN AND IMPLEMENTATION OF LEARNING SYSTEMS WITH VIRTUAL ENVIRONMENTS

24T36

Learning Outcomes: Attendees will come away with a knowledge of cybersickness (CyS), including causes and factors affecting CyS, as well as how to design virtual environments (VEs) and curricula to minimize CyS effects upon students and learner outcomes.

Purpose: This tutorial is designed to provide those involved in producing and implementing VEs for training with a basic knowledge of CyS. This is significant because CyS can reduce the training effectiveness of systems utilizing VEs and visual simulations, even to the point of making it unusable. Mitigating the effects of CyS begins in the design of the system, where minor decisions can result in substantial differences in the CyS effects of the final system. Likewise, curricula design can greatly impact the degree that CyS affects students.

Background: Militaries across the globe are planning on utilizing VEs to improve their training, whether they be traditional simulators using screens or the most up-to-date technology such as head mounted displays for virtual reality, augmented reality, mixed reality, or extended reality. There is a general belief among both the general public and the training community that the technological advancements in the latest generation of these devices have eliminated the effects of CyS. However, this is decidedly not true.

CyS is a phenomenon that occurs when individuals experience symptoms while using simulation technology, such as flight simulators or VEs. These symptoms include disorientation, dizziness nausea, headaches, eye strain, general discomfort, and fatigue as well as others. These affect a large percentage of the user population, with some experiencing minor effects easily ignored and others being unable to utilize the system at all.

Improvements in technology have reduced or eliminated some of the causes of CyS, but there are causes that are inherent in humans which technology is unlikely to eliminate. This means that everyone involved in the design, development, and implementation of training VEs must understand the causes of CyS, how to mitigate them, and how to create systems that reduce both the likelihood and severity of CyS symptoms. Otherwise, it will be impossible to properly utilize the incredible potential of these technologies.

Topics: This tutorial will provide attendees with a basic knowledge of the underlying causes of CyS, which factors aggravate or mitigate CyS, how CyS degrades learning, as well as how to design a VE system and create a curriculum to minimize CyS's effects.

PRESENTERS

Kay Stanney, Design Interactive, Inc.
Perry McDowell, The MOVES Institute, Naval Postgraduate School
LCDR Nicholas Adriaanse, USN, NSWCDD DNA

TUT 5: LIFECYCLE OF M&S CONFIDENCE — FROM ACORN TO TREE
1245 – 1415 • 320C

ACCREDITATION OF SIMULATION-BASED EXPERIMENTS: BEYOND THE M&S

24T12

The Department of the Army has no individual or organization that accredits a simulation-based experiment (SIMEXp). Army Regulations require that modeling and simulation (M&S) be accredited – but none of the other components required to execute a SIMEXp. Each of the Army's Centers of Excellence (maneuver, fires, air maneuver, maneuver support, sustainment and heath readiness) conduct multiple SIMEXp annually- the Maneuver Battle Lab alone averages eight to ten per year, but no outside agency or regulation accredits the events. The purpose of this tutorial is to present a framework for SIMEXp accreditation and enable attendees to understand all of the areas which must be accredited for the overall accreditation of a SIMEXp. Accreditation of the M&S will be discussed, as it serves as the foundation for an overall accreditation, but there are other equally important components requiring separate accreditations. After participating in the tutorial, attendees will be able to identify the components of tactical and operational scenarios which must be validated by current Warfighters – and that the person who accredits those aspects must have credible knowledge of the current state of doctrine, military organizations, and operational concepts (friendly and enemy) to be studied.

The tutorial will address that the U.S. Army's regulatory accreditation of the M&S does not addresses the accreditation of the physical and computational environment on which the SIMEXp is conducted. Not only must the M&S be accredited, but also the hardware and network on which they are running to ensure processors are robust enough to execute as required, the network transmission speeds are sufficient, and no packets are lost during execution.

Finally, attendees will learn how to design and assess the analytical methods used during a SIMEXp to ensure accreditation of the analysis of the SIMEXp. The analysis plan, data collection and reduction methodology, and computational methods for analyzing the data must all be documented and accredited in a peer-reviewed final report in order for the overall SIMEXp to be accredited. This tutorial is intended for those interested in gaining a better understanding of proper SIMEXp design and why more than just the M&S must be accredited. Following previous presentations of this tutorial at I/ITSEC, the methodology has been recommended for inclusion in the pending update to the U.S. Army Pamphlet 5-11, Verification, Validation, and Accreditation of Army Models and Simulations, and presented as a block of instruction to the US Army Modeling and Simulation School Simulation Operations and VV&A Courses.

PRESENTERS

Thomas Yanoschik, CMSP, SAIC
Cynthia Dunn, CMSP, SAIC
Stephen Miller, SAIC
Jacob Kelly, CMSP, MCDID, MBL

TUT 6: ACCESSIBILITY AND THE HUMAN ELEMENTS OF TRAINING
1245 – 1415 • 320D

SPELL CASTING: CALLING THE POWER OF ACCESSIBLE DESIGN TO YOUR SERIOUS GAMES AND SIMULATIONS

24T60

Federal Procurement Regulations and the Americans with Disabilities Act apply to modeling and simulation (M&S) programs and serious games used in education, skill development, employee selection, credentialing, routine work, and promotion opportunities for defense communities as well the general public. These regulatioins require that individuals with disabilities have access to and comparable use of digital information and data compared with individuals without disabilities. Historically advanced simulations and serious games have provided basic in-product accommodations or provided alternative non-interactive content to support equal content access for all. These accomodations fall short of providing equivalent experiences, thus allowing non-disabled users preferential interaction with content known to result in more effective learning, performance, and skill demonstration. Ideally, applications should be usable by all, accommodating disabled users through support for the assistive technologies they utilize in their daily lives. While this sounds easily agreeable, in practice barriers to providing inclusive interactive experiences and gameplay are prevalent. Guidelines for accessibility aren't currently directed for simulation and game development technologies. The most used development engines render end products inaccessible to assistive technologies. Product budgets are often lower than developers request even without accounting for accessibility requirements. And the creation community lacks actionable accessible design guidance. To close this gap in accessible design guidance, we extend the standards used for other types of digital information. The widely recognized Web Content Accessibility Guidelines (WCAG), developed for traditional web content, can be adapted to address accessibility in interactive simulations and games. Extended to simulations and games, WCAG offers generalized accessibility themes to inform developers of complex, dynamic user experiences. By designing to WCAG principles, developers can ensure that their games and simulations will be accessible to a wide range of users. Referencing WCAG also provides a generally understood lexicon to communicate the accessibility approach and accessibility level of products. To aid customers in evaluating a product's accessibility in procurement, the delivery organization provides a completed Voluntary Product Accessibility Template (VPAT) that references the WCAG framework to specify how accessibility has been achieved. This tutorial offers the simulaiton and serious games creation and procurement communities a practical guide to accessibility. Topics include: an overview of regulations, requirements, and consumer accessibility expectations, WCAG introduction with concepts anchored by M&S relevant examples, an overview of the VPAT and process for its creation and use, discussion of accessible design considerations and development approaches to meet simulation and serious game accessibility goals, and design chal-

lenge highlights and process recommendations from efforts to provide engaging interactive experiences and gameplay for all.

PRESENTERS
Jennifer McNamara, Breakaway Games
Michael Brooks, The Pennsylvania State University World Campus

TUT 7: XR MR VR - GET REAL ^3
1245 – 1415 • 320E

MISSION XRPOSSIBLE: NAVIGATING NOVICE-TO-EXPERT ASSESSMENT DESIGN IN MEDICAL & MILITARY TRAINING

24T31

This 90-minute tutorial offers a comprehensive guide tailored for professionals seeking to adeptly design assessments within extended reality (XR) training simulations to bring the novice to an expert.

As XR technologies continue to revolutionize training methodologies, the ability to accurately measure and track novice learners' progression towards expert proficiency is paramount. This tutorial addresses this crucial need by providing attendees with practical strategies and insights to develop assessments that effectively capture evidence of skill acquisition and competence development in XR environments.

The tutorial will begin with the fundamental principles of assessment science and the practice of designing assessments within XR contexts. Participants will gain a deep understanding of the unique considerations inherent to XR simulations, including fidelity, authenticity, and adaptability. Leveraging a learning engineering approach to developing XR simulations, there will be an emphasis on the significance of aligning assessment strategies with specific learning objectives and competency requirements.

There will be a review of the importance of designing assessments for interaction data that can be used for data analyses, which in turn can provide nuanced insights into learners' knowledge, skill, and competency development trajectories. Emphasis will be placed on leveraging XR-specific features to gather rich, multi-dimensional data that accurately reflects learners' proficiency levels.

By the conclusion of this tutorial, attendees will be equipped with the requisite knowledge to design assessments that effectively measure novice-to-expert progression within XR training simulations. Participants will be empowered to optimize their training programs, enhance learning outcomes, and ultimately elevate performance standards in critical domains.

PRESENTERS
Jeanine DeFalco, Ph.D., University of New Haven
Madeleine Keehner, Ph.D., Brighter Research, LLC

TUT 8: NAVIGATING GLOBAL PARTNERSHIPS
1245 – 1415 • 320F

U.S. EXPORT CONTROLS, NATIONAL SECURITY, AND THE SIMULATION INDUSTRY IN 2024

24T54

The U.S. export control laws and regulations are playing an ever-increasing role in protecting U.S. national security. Companies in the modeling and simulation industry have a part to play in supporting our national security. This tutorial will provide an understanding of the Export Administration Regulations (EAR) and the International Traffic in Arms Regulations (ITAR) and their application to the modeling and simulation industry. There will be particular focus on how the regulations apply to the simulation industry, including controls on software, hardware, services, and activities at trade shows such as I/ITSEC. The tutorial will provide attendees with an update to the regulations resulting from recent changes and developments in U.S. policies towards Russia and China, as well as other countries. Presenters will discuss examples of simulations products and services, and associated licensing strategies, in the current regulatory environment.

PRESENTER
Darren Riley, Riley Trade Law PLLC

TUT 9: LAGNIAPPE
1245 – 1415 • 320G

HOW THE BRAIN CREATES REALITY; ENHANCING THE REALITY EXPERIENCE WITH LARGE AREA HAPTIC FEEDBACK

24T61

To create simulations that completely reproduce reality, it is important to understand how the human brain processes the real world. Many people believe humans only have five or six physical senses. This traditional view results in limited attempts to give the brain the information it needs to believe a simulation experience is real. When system designers understand the multiple sensory channels within the human body, they can incorporate elements into their design to stimulate those channels, enhancing the believability of the training experience. Large Area Haptic Feedback will be used to demonstrate how to construct and inject reality information simultaneously into multiple sensory channels.

This tutorial will take a deep dive into how to recreate reality. First, we will examine how sensory receptors in the body gather environmental information. Second, we will examine how the brain processes that information to create an understanding of reality. Third, we will examine principles for constructing and injecting information into a person's body to enhance the sense of reality. Finally, we will use Large Area Haptic Feedback to demonstrate how to construct and inject reality information into a simulation experience.

PRESENTER
Bill Phillips, Clark Synthesis, Inc.

TUT 10: AI & YOU
1245 – 1415 • 330GH

MACHINE LEARNING: AN INTRODUCTION FOR HUMANS

24T20

The field of Machine Learning (ML) began in the 1950s, and it became a major, widespread research area in the 1980s. Over the past 10-20 years, innovations in computer hardware, computer languages, computer memory, and new algorithms have kicked off a rapid escalation in the capabilities of ML systems. As a result, the common refrain from stakeholders is "I want my system to learn!" But what does it really mean for a system be able to learn? When is it a good idea and when is it not? What kinds of things are computers good at learning, and where are there still weaknesses? How does this all work, really?

This tutorial abstracts away from the mathematical and computational details to offer a high-level understanding of "how ML works", as well as its capabilities, strengths, and weaknesses, The tutorial presents the broad categories of learning that current ML approaches address, together with examples that provide an intuitive feel for how each approach is able to work, without delving into the specifics of the complicated math that provides much of the "magic". The tutorial also investigates the "art" behind the science, introducing the work an ML practitioner needs to add to apply these powerful algorithms successfully to new problems.

The tutorial finishes by summarizing some of the types of human learning that are still on the ML frontier, waiting to be understood and conquered, as well as an overview of methods to decide which parts of your problem might be best suited to non-learning algorithms.

PRESENTER

Randolph Jones, Ph.D., CMSP, Soar Technology, LLC

To view author bios, please view the Digital Program at **IITSEC.org/Agenda/Agenda-Details.**
The most up-to-date session information is available on the mobile app.

ROOM	SESSION	1400	1430	1500
ROOM 320A	TR 1: Navigating Tech Hurdles in Military Training	24235 Understanding Trainee Cognitive Processes in ATC Training	24229 A Review on Education and Training Needs for Military Space Operations	24163 A Method to Assess Barriers to Implementing Training Technologies
ROOM 320B	SIM 1: The Future of Modeling Human Elements in Simulation	24432 COMBAT-711: A Tool for Integrating Human Factors into Wargames	24339 MetaPOL: A Digital Twin for Human Patterns of Life in Indoor Secure Facilities	24368 Behavior Envelopes for Defining Performance Metrics in Complex Scenarios
ROOM 320C	HPAE 1: Virtual Fusion: Real-World Applications of XR	24185 Utilizing Extended Reality Usability Heuristics to Drive Effective XR Training Applications	24161 Interaction Design for Binary Reverse Engineering in Virtual Reality	24187 Virtual Reality Cue Exposure Therapy System
ROOM 320D	SIM 2: Cyber & Security	24208 Fortifying the Virtual Battlefield: Integrating Cyber Effects Using Simulation	24269 Development of a Novel Architecture for Improving Cyber-Kinetic Training	24189 Zero Trust Security in Cloud-based Simulation
ROOM 330EF	Best Paper Nominee Session 1	24165 EDUCATION: Context-Sensitive Attribute and Competency Assessment	24267 PSMA: Are LLMs Too Smart for Their Own Good?	24136 ECIT: Converting 2D Images to Geospatial 3D Models Using Generative AI

ROOM	SESSION	1600	1630	1700
ROOM 320B	SIM 3: Building The Digital World – Part 2	24464 Open-Source MARL for Autonomous Agent Research: A New Godot-based Environment for BVR Air Combat Simulation	24460 Establishing Best Practices to Apply a Generic Point Cloud Model (GPM) Uncertainty to High Resolution Data	24328 Computer-Generated Forces Team Behavior within Air Combat Simulations: Concept and Agent Structure
ROOM 320C	HPAE 2: Cognitive Chaos and Skillful Swagger	24201 Assessing Cognitive Workload Prediction Models Using a Continuous Subjective Approach	24281 Enhancing a Piloting Task Simulator with Real-time Performance Feedback, Autopilot Disruption, Shock Punishment, and Adaptive Task Difficulty	24164 Systematic Approach to Upskilling Learning Professionals for the Development of Modernized Training
ROOM 320D	SIM 4: Multi-Domain Simulation	24139 Requirements for Simulation of the Future Operating Environment and Multi-Domain Operations	24158 Open-Vocabulary High-Resolution 3D (OVHR3D) Data Segmentation and Annotation Framework	24152 The Potential of LVC for Creating Air Power – Beyond Adversaries
ROOM 320E	ECIT 1: AI Unleashed: Mastering Clustering, Interfaces, and Autonomous Systems	24257 An Enhanced Approach to Dynamic Unsupervised Clustering	24313 Adaptive Interfaces for Better Decision Making	24346 Unsupervised Testing for Software Systems of Autonomous Vehicles
ROOM 320F	ECIT 2: Interpretable AI & Data Evaluation	24198 Interpretable Learning with Distance Aware Radial Basis Function Networks	24251 Dual-Stream Semantic Segmentation Architecture for Point Cloud Data Analysis	24277 Evaluation of Historical Journalism Data for Decision-Support System Gray-Zone Models
ROOM 330EF	Best Paper Nominee Session 2	24378 SIMULATION: Beyond Illusions: Navigating VR Fidelity in Undergraduate Pilot Training — A 3-Year Data Analysis	24322 TRAINING: Airway Skills Assessment with Spatio-Temporal Attention Mechanisms Using Human Gaze	24303 HPAE: Assessing Cognitive Workload in Mixed Reality Flight Simulators for Naval Aviation

ROOM	SESSION	0830	0900	0930
ROOM 320A	TR 2: Ensuring VR Training Effectiveness: Approaches and Examples	24188 VR Team Training for Military Special Forces	24369 A Novel Immersive Approach for Spatial Disorientation Training	24244 Virtual Reality Training for In-air Refueling
ROOM 320B	SIM 5: My 3D World	24326 Converting One World Terrain Geospatial Content to CDB	24440 Abstracting Geo-specific Terrains to Scale Up Reinforcement Learning	24243 Mesh-as-a-Service: Automated 3D Modeling Fast as L-AI-ghtning
ROOM 320C	HPAE 3: XR: It's Not Just About Flapping Your Arms	24240 B-52 Pilots in Focus: Human Factors in Virtual Reality Research	24265 Integrating Cognitive and Skills Training in a Simulated UAS (Unmanned Aerial Systems) Pilot Training Course	24437 Spatial Accuracy Requirements for Visual Search Cues in Simulated Sparse and Dense Scenes
ROOM 320D	ED 1: BYTE Size Learning: AI in ED	24203 Artificial Intelligence Techniques and Best Practices to Improve Motivation and Learning	24436 Optimizing Readiness Through AI-Driven Analytics for Automated Training Insights	24458 Automated Radio Operator Utterance Recognition for U.S. Navy Training
ROOM 320E	ECIT 3: Data Driven Training: Because Guesswork is So Last Century!	24111 Revolutionizing Simulation: Pioneering a Data-Centric Future in Defense Training Environments	24325 Lessons Learned Supplementing Instructor-Led Training with AI	24470 Automated Event-Based Competency Analysis: Detecting Evidence from Training Data
ROOM 320F	ECIT 4: LLM Production and Threat Models	24169 Bridging the Interoperability Gap Using Large Language Models and STITCHES	24224 Evaluating the Trustworthiness of Large Language Models for Code Generation	24329 Predictive Threat Models for Real-Time Decision Support
ROOM 320G	PSMA 1: Streamlining Digital Asset Management	24172 Comparison of Intermittent Demand Forecasting Methods in Predicting the Repair of Simulators Based Upon System State	24359 Improving Training and Education Supply Chains by Harnessing Data Pipeline Observers	24418 When to Embrace Redundancy: Practical Guidance for Managing Digital Assets

ROOM	SESSION	1030	1100	1130
ROOM 320A	TR 3: Improve Combat Readiness through Digitalization	24148 Integration of First Person View Drones in Simulation	24334 A Statistical Method for Non-Laser-Based Force-on-Force Training Systems	24323 Future Combat Training System – Improved Live Fire Training by Digitalization
ROOM 320B	SIM 6: VR Good	24455 Soldier Centric Design of Mixed Reality Reconfigurable Virtual Collective Trainers	24141 Advanced Navigation Team Shipboard Simulation	24348 Training through Simulation of Border Patrol Incidents
ROOM 320C	HPAE 4: Data-Driven Initiatives for Training and Team Dynamics	24146 Data Collection, Reduction and Analysis Initiative for Integrating U.S. Army Data Plan into Warfighter Qualifications	24242 Taking a Data-Informed Approach to Squad Training Evaluations	24305 Studying Team Effectiveness via Dialogue Analysis
ROOM 320D	ED 2: Learning Engineering-Applied	24296 Enhancing Medical Performance Assessment Using Competency Frameworks	24404 Applying Learning Engineering Process to Existing Military Training Programs: F-35 Demonstration	24405 The Future of Training and How to Reach It
ROOM 320E	ECIT 5: It's All About the Data	24215 Metalog Synthetic Data Generation for Healthcare	24246 Development and Evaluation of Biosensing Apparel for Monitoring Fighter Pilot Physiological Episodes	24258 A Biosensor Solution for Real-time and Prognostic Health Monitoring
ROOM 320F	ECIT 6: Generative AI & Geospatial Intelligence	24106 Geomancer: Enhancing Geospatial Intelligence with a Natural Language-Assisted Mapping Interface	24171 Model-Based Systems Engineering Approach to Model & Simulate Space Experiments Using Teamwork Cloud	24227 Understanding Complex 4D Sonar Operating Conditions Using Virtual Environments
ROOM 320G	PSMA 2: AI: Fact or Science Fiction?	24109 Wargaming: Toward the Development of a Generative AI for Weather Simulation	24114 The Boyd Loop Explanation of Artificial Intelligence for Policy Makers	24331 Leveraging Science Fiction Case Studies to Specify Immersive Training System Requirements

ROOM	SESSION	1330	1400	1430
ROOM 320A	TR 4: Tailored Training Solutions for High-Risk Professions, Insight from Firefighting, Aviation and Parachuting	24162 Simulation Training for High Stress Environments in the Fire Service	24179 Optimizing Simulation Fidelity for Cost-Effective Aviation Training	24212 Investigating Field of Regard Implications in Simulated Parachute Descent Training
ROOM 320B	SIM 7: Conversation Starters: Let's Talk About It	24465 Developing a Novel UAS Flight Planning and Reconstruction Software Package	24298 Digital Caricature: Stochastic M&S of Complex System of Systems	24439 Top 10 DIS V8 Improvements
ROOM 320C	HPAE 5: Is HAL Your Pal?	24428 Multimodal Machine Learning Framework for Soldier Fatigue Prediction	24443 Training Individual ML Classification Models of Warfighter State with fNIRS	24268 Towards a Real-Time Model of Trust in Human-Machine Team Paradigms
ROOM 320D	ED 3: Extending Realities in Education	24103 Implementation of Game-based M&S Tools to Enhance K9-12 STEM Learning Effectiveness	24132 Enhancing Military Planning Through Virtual Reality: A Study on Spatial Skills and Map Interpretation	24373 Towards a Cognitive Framework for Assessing Students and Adapting Interventions in Extended Reality (XR)
ROOM 320E	ECIT 7: AI Agents & Training	24319 Digitally Designed – Applying AI Agents to Digital Twin Development	24407 Mastering Digital Twins: Introducing ABoT for Cross-Disciplinary Simulation and Model-Based System Engineering	24490 Binary Source of Truth: Leveraging Digital Twins to Enable Agile Systems Engineering
ROOM 320F	ECIT 8: AI for Synthetic Environment Generation	24102 Electro-optical Image Synthesis from SAR Imagery Using Generative Adversarial Networks	24186 Generative AI-powered 3D-Content Creation for Military Training	24210 More Than a Kid's Toy: Using NeRF to Create 3D Models
ROOM 320G	PSMA 3: Medical Learning: Standards Required?	24112 Data Analytic Considerations for Audio, Video, and Simulation Trace Data: Enabling Decisional Advantage	24200 Medical Modularity and Interoperability: How Will We Get There?	

ROOM	SESSION	1530	1600	1630
ROOM 320A	TR 5: Bridging the Gap in Training through Technology	24121 Training Effectiveness of a VR HMD-based Simulator in Air Force Pilots	24236 The Digital Divide: Implications for Training and Education	24430 Technological Fluency: A First Step in Rethinking Army Training
ROOM 320B	SIM 8: Building The Digital World — Part 1	24295 Novel Techniques for Processing Building Exteriors Captured from Photogrammetry	24317 Whole Earth Fraternal Twin Content for Flight Simulation	24199 Simulating the Weaponization of Public Opinion in Multi-Domain Scenarios
ROOM 320C	TR 6: How AI is Training Us!	24374 LLM-Enabled Real Time Training Content Curation to Enhance Performance	24377 Separating Myth from Method: The AI Revolution in Military Training	24414 A Deeper Dive into Using Machine Learning for Discovering the Root Causes for Student Failures Using Experience API (xAPI)
ROOM 320D	ED 4: Learning Leaders — Leaders Learning	24175 Filling the Gaps in the Johari Window through Simulation-based Learning: Perception vs Reality for Incident Commanders	24220 Breaking Silos to Build the Next Generation of Navy Leaders	
ROOM 320E	ECIT 9: Foundation Models and Human-AI Interaction	24304 From Fascinations with Foundation Models to a Useful Conversational AI Application	24315 SAR-AR: Adapting Human Vision to Complex Sensing Technologies with Adaptive Synthetic Aperture Radar Image Recognition Training	24366 A Human Digital Twin Architecture for Knowledge-based Interactions and Context-Aware Conversations
ROOM 320F	Zombies & AI	24194 TRAINING: Expanding Access to Learning Decision-Making and Teamwork Skills Using Low Fidelity, Tabletop Games: A Measurement Approach	24135 ECIT: Human-AI Common Ground for Training and Operations	24232 SIMULATION: Social Simulator Madness: Simulating Social Behavior in Dynamic Environments
ROOM 320G	PSMA 4: Data Distinction in Our Digital World	24204 An Open Standards Data Model and Taxonomy to Enable Digital Twins for Defense	24333 Policies Motivating the Data Mesh	

ROOM	SESSION	0830	0900	0930
ROOM 320B	SIM 10: M&S in Wargaming	24343 M&S as a Service Composability Lessons from NATO	24433 Leveraging MSaaS Concepts to Enable Mission Environments: Lessons Learned	24307 Development of Closed-Loop Wargaming Simulation Software: Challenges, Best Practices, and Lessons Learned
ROOM 320C	SIM 11: Digital Twins	24133 PINNball Wizard: Conjuring Digital Twins with Physics-Informed Neural Networks	24143 Warfighter Digital Twins for Simulating Mission Performance	24276 Digital Twins for Modeling Replacement Time for CAD/PAD
ROOM 320E	ECIT 10: AI Trust and Optimization	24264 Mapping Trust in AI: Right Tool, Right Task	24335 Compound AI Ecosystem: Agents and Tools to Improve Training and Learning	24344 AI-driven COA Generation Using Neuro-symbolic Methods
ROOM 320F	ECIT 11: Synthetic Data & AI Frameworks	24206 Next-Generation Training with Advanced Visualization and Digital Twins	24217 A Machine-readable Narratological Approach to the Design of Human Performance Descriptions for Synthetic Training Environments	24301 Modular Analytics Framework for Rapid AI/ML Training and Deployment
ROOM 320G	PSMA 5: The Human Element: Training, Policy and Standards	24256 What is an M&S Expert? Clarifying Competency Expectations in the DAF's Modeling and Simulations Workforce: A Case Study	24154 Generalizable Learning Engineering Adoption Maturity Model	24181 Automated Human Performance Measurement: Standardizing Lifelong Learning Training Data

ROOM	SESSION	1030	1100	1130
ROOM 320A	TR 7: DARTs, STICKs, and Digital Dominance	24150 Operation: D.A.R.T (Designing Augmented Reality for Transfer) Improving Preparedness for Basic Combat Training Candidates	24157 Surpass the Adversary: Enhanced Mission Training through Digital Engineering	24320 How to Make Military Training STICK (Superior Task Implementation of Core Knowledge)
ROOM 320B	SIM 12: Soaring with Flight Simulators	24155 Leveraging Data Center Architectures for Full Flight Simulators	24380 Analyzing Visual Fidelity in Flight Simulation Software Using Game Engine with Feature Mapping	24218 Optical See-Through Mixed Reality as a Cybersickness Mitigation Strategy in Extended Reality Helicopter Flight Simulation
ROOM 320C	TR 8: Cognitive Collaborators, Tasks and Teamwork	24238 Development and Testing of Extended Reality Input Modalities for a Virtual Learning/Training Task	24283 Enabling Effective Training with Mission Partners Using Resilient Multilevel Architectures	24324 Development of Team Dynamic Measurement Framework Using Hybrid Cognitive Task Analysis
ROOM 320D	ED 5: Implementation of Competency Based Education	24120 Learning Engineering Competency-Based Experiential Learning within Military Institutional Training and Education	24416 From Lab to Battlefield: Exploring the Relationship Between Military and Basic Science Tasks for Measuring Competencies	24424 Learning to Learn II: Evaluation of Learning Systems for Supporting Competency Based Education
ROOM 320E	ECIT 12: Advanced AI Techniques for Risk Aware Flight Control & Combat Optimization	24219 Mastering Air Combat, Using Neural Fields for AI Introspection	24255 Uncertainty Aware Distributional Ensemble Reinforcement Learning for Flight Control	24273 Optimization to Minimize Risks Using Continuous Asymmetric Risk Analysis
ROOM 320G	PSMA 6: Digital Engineering: Embrace the Change	24274 Implementing MBSE Organizational Change at the USAF Simulators Division	24275 Digital Sustainment, A Strategy For Success	24457 DoD Instruction 5000.97 – Digital Engineering: Assessing the Impact on the Department's M&S Enterprise

ROOM	SESSION	1330	1400	1430
ROOM 320A	TR 9: Tech Done Right	24365 A Suite of Devices: Applying Immersive Learning Taxonomy and Flow Theory to Military Training Program Device Acquisitions	24361 Behavior-based Performance Optimization In Emerging Training Environments	24262 Enhancing Air Force Training: A Data Integration Framework
ROOM 320C	TR 10: Future Frontlines: Enhancing Military Training and Healthcare with Digital Innovation	24288 Training Effectiveness for Mobile Extended Reality: a Case Study Using Tactical Combat Casualty Care Training and Readiness	24494 Evaluation of a Novel Team-Based VR Curriculum for Advanced Resuscitative Care	
ROOM 320E	ECIT 13: Training and Performance Assessment	24250 Use of Large Language Models in Assessing Training Performance	24254 From Innovation to Integration: Data-Driven Evaluation of Modernized Training	24471 Preparing for LSCO: M&S Approaches to Rapidly Improve Medical Training
ROOM 320G	PSMA 7: Managerial Challenges: The Good, the Bad and the Ugly!	24151 Exploiting Experimentation: A Managerial Challenge	24294 Achieving Accreditation Utilizing Model Development Indices and Model Description Reports	24422 Preventing and Handling Offensive Behavior in Military Training

BEST PAPER NOMINEE

BP 1 TUESDAY, 3 DECEMBER • 1400 – 1530 • ROOM 330EF

BEST PAPER NOMINEE SESSION 1

Session Chair: Toni Hawkins-Scribner, Ph.D., Air University

Session Deputy: Greg Ouellette, NAWCTSD

24165 Education: Context-Sensitive Attribute and Competency Assessment
Jayne Allen, Ph.D., U.S. Army Research Institute for the Behavioral and Social Sciences; Randy Brou, Ph.D., Army Research Institute; Frederick Diedrich, Ph.D., Independent Consultant; Scott Flanagan, Sophia Solutions, LLC; Krista Ratwani, Ph.D., Tatiana Toumbeva, Ph.D., Aptima, Inc.

24267 PSMA: Are LLMs Too Smart for Their Own Good?
Kyle Russell, Connor Green, Eric Ahmadi, Jason Smith, Michael Yohe, CAPT Tim Hill, USN (Ret.), William Marx, Ph.D., Dustin Easterling, Chanler Cantor, Intuitive Research and Technology Corporation

24136 ECIT: Converting 2D Images to Geospatial 3D Models Using Generative AI
Tim Woodard, Brent Bartlett, Ph.D., Zoë LaLena, Everett Spackman, Chris Holland, NVIDIA

BP 2 TUESDAY, 3 DECEMBER • 1600 – 1730 • ROOM 330EF

BEST PAPER NOMINEE SESSION 2

Session Chair: Benjamin Bell, Ph.D., Eduworks Corporation

Session Deputy: William "Bill" Gerber, Ph.D., WJGerberConsulting

24378 Simulation: Beyond Illusions: Navigating VR Fidelity in Undergraduate Pilot Training — A 3-Year Data Analysis
David Urban, Vertex Solutions; Ryan Pritchard, U.S. Air Force

24322 Training: Airway Skills Assessment with Spatio-Temporal Attention Mechanisms Using Human Gaze
Jean-Paul Ainam, Ph.D., Rahul Rahul, Ph.D., Rensselaer Polytechnic Institute; Lora Cavuoto, University at Buffalo; Matthew Hackett, Ph.D., U.S. Army DEVCOM SC; Jack Norfleet, Ph.D., U.S. Army DEVCOM SC STTC; Suvranu De, Ph.D.

24303 HPAE: Assessing Cognitive Workload in Mixed Reality Flight Simulators for Naval Aviation
Thomas Cecil, Charles Rowan, Ph.D., Perry McDowell, Naval Postgraduate School; Jon Vogl, U.S. Army Aeromedical Research Laboratory

EDUCATION

ED 1 WEDNESDAY, 4 DECEMBER • 0830 – 1000 • ROOM 320D

ED 1: BYTE SIZE LEARNING: AI IN ED

Session Chair: Erin McCormick, AFRL

Session Deputy: Carter Hoffman, U.S. Space Force

24203 Artificial Intelligence Techniques and Best Practices to Improve Motivation and Learning
Maggie Mosher, Ph.D., Amber Rowland, Ph.D., Bruce Frey, Ph.D., Sean Smith, Ph.D., University of Kansas; Adam Carreon, Ph.D., Georgia Southern University; Tolulope Sulaimon, University of Central Florida

24436 Optimizing Readiness Through AI-Driven Analytics for Automated Training Insights
Svtilana Volkova, Ph.D., Summer Rebensky, Ph.D., Isabel Erickson, Louis Penafiel, Hsien-Te Kao, Aptima, Inc.

24458 Automated Radio Operator Utterance Recognition for U.S. Navy Training
Morgan Ulinski, Ph.D., Ethan Medjuck, Kellen Bixler, Soar Technology, LLC; Henry Phillips, IV, Advanced Distributed Learning (ADL) Initiative

ED 2 WEDNESDAY, 4 DECEMBER • 1030 – 1200 • ROOM 320D

ED 2: LEARNING ENGINEERING – APPLIED

Session Chair: Thea Albertson, Serco North America

Session Deputy: Aaron Presnall, Jefferson Institute

24296 Enhancing Medical Performance Assessment Using Competency Frameworks
Matthew Hackett, Ph.D., Combat Capabilities Development Command - Soldier Center; Tim Welch, Eduworks Corporation

24404 Applying Learning Engineering Process to Existing Military Training Programs: F-35 Demonstration
Jennifer "JJ" Walcutt, Ph.D., Patricia Bockelman, Ph.D., Jay Spohn, SAIC

24405 The Future of Training and How to Reach It
Caroline Shawl, DSTL; Daran Crush, QinetiQ

ED 3 WEDNESDAY, 4 DECEMBER • 1330 – 1500 • ROOM 320D

ED 3: EXTENDING REALITIES IN EDUCATION

Session Chair: Frank Karluk, CMSP, DLH Corporation

Session Deputy: Stacie Henn, Prince William County, VA

24103 Implementation of Game-based M&S Tools to Enhance K9-12 STEM Learning Effectiveness
Kevin Hulme, Ph.D., CMSP, The Stephen Still Institute for Sustainable Transportation and Logistics (SSISTL); Qian Wang, Ph.D., Gongda Yu, Aaron Estes, Ph.D., Irina Benedyk, Ph.D., Presentacion Rivera-Reyes, Ph.D., Vidhi Solanki, Emeric Humbert, University at Buffalo

24132 Enhancing Military Planning Through Virtual Reality: A Study on Spatial Skills and Map Interpretation
Jerson Neto, Brazilian Army; Luciana Nedel, UFRGS; Anderson Maciel, U Lisboa

24373 Towards a Cognitive Framework for Assessing Students and Adapting Interventions in Extended Reality (XR)
Gregory McGowin, University of Central Florida; Stephen Fiore; Georges Potworowski, Tarah Daly, Jennifer Phillips, Cognitive Performance Group; Jeremiah Folsom-Kovarik, Ph.D., Soar Technology, LLC; Henry Phillips, IV, Advanced Distributed Learning (ADL) Initiative; Joseph Cohn, Ph.D., Soar Technology, LLC

ED 4 WEDNESDAY, 4 DECEMBER • 1530 – 1630 • ROOM 320D

ED 4: LEARNING LEADERS – LEADERS LEARNING

Session Chair: Don Lail, U.S. Army DEVCOM Chemical Biological Center

Session Deputy: David Stargel, AFAMS

24175 Filling the Gaps in the Johari Window through Simulation-based Learning: Perception vs Reality for Incident Commanders
Amanda Davies, Ph.D., Charles Sturt University

24220 Breaking Silos to Build the Next Generation of Navy Leaders
Holly Baxter, Ph.D., John Spinda, Ph.D., Bradley Celestin, Ph.D., Cognitive Performance Group; LCDR Michael Natali, Ph.D., USN, ONR

ED 5 THURSDAY, 5 DECEMBER • 1030 – 1200 • ROOM 320D

ED 5: IMPLEMENTATION OF COMPETENCY BASED EDUCATION

Session Chair: Lisa Jean Bair, SAIC
Session Deputy: Linda Bernard, Ultisim

24120 Learning Engineering Competency-Based Experiential Learning within Military Institutional Training and Education
Kevin Owens, Applied Research Laboratories: The University of Texas at Austin; Lisa Townsend, Benjamin Goldberg, Ph.D., U.S. Army DEVCOM SC STTC; Gordon Cooke, U.S. Military Academy; Jared Abrams, Applied Research Laboratories: The University of Texas at Austin

24416 From Lab to Battlefield: Exploring the Relationship Between Military and Basic Science Tasks for Measuring Competencies
William Stalker, Summer Rebensky, Ph.D., Ramisha Knight, Aptima, Inc.; Samantha Perry; Shawn Turk, Aptima; Quintin Oliver, AFRL; Wink Bennett, Ph.D., Bennett Research Consulting, LLC

24424 Learning to Learn II: Evaluation of Learning Systems for Supporting Competency Based Education
Nathan Jones, Nate Ferrara, Spinnaker Institute, Inc.

EMERGING CONCEPTS & INNOVATIVE TECHNOLOGIES

ECIT 1 TUESDAY, 3 DECEMBER • 1600 – 1730 • ROOM 320E

ECIT 1: AI UNLEASHED: MASTERING CLUSTERING, INTERFACES, AND AUTONOMOUS SYSTEMS

Session Chair: Kea Matory, Purdue Applied Research Institute (PARI)
Session Deputy: Crystal Maraj, Ph.D., UCF/IST

24257 An Enhanced Approach to Dynamic Unsupervised Clustering
Christopher Heinlen, Randal Allen, Ph.D., CMSP, Mark Volpi, Lone Star Analysis

24313 Adaptive Interfaces for Better Decision Making
David Nelson, USC Institute for Creative Technologies; Russell Cohen Hoffing, Army Research Lab West; Steven Thurman, U.S. Army DEVCOM Army Research Lab; Rhys Yahata, David Cobbins, Mark Core, Deniz Marti, Anthony DeCapite, Allison Aptaker, USC Institute for Creative Technologies; Rylan Pozniak Daniels, University of Southern California

24346 Unsupervised Testing for Software Systems of Autonomous Vehicles
Sean Hickey, University of Michigan; Geng Zhang, Michigan Engineering Services; Jonathon Smereka, Ph.D., ; Nickolas Vlahopoulos, University of Michigan

ECIT 2 TUESDAY, 3 DECEMBER • 1600 – 1730 • ROOM 320F

ECIT 2: INTERPRETABLE AI & DATA EVALUATION

Session Chair: Javier Garza, Lockheed Martin Corporation
Session Deputy: Adam Kohl, Iowa State University

24198 Interpretable Learning with Distance Aware Radial Basis Function Networks
Ethan Cramer, Randal Allen, Ph.D., CMSP, Lone Star Analysis

24251 Dual-Stream Semantic Segmentation Architecture for Point Cloud Data Analysis
Brendon Hales, Philly Tang, Troy Crawford, Marjaneh Safaei, Ph.D., Dignitas Technologies

24277 Evaluation of Historical Journalism Data for Decision-Support System Gray-Zone Models
Joseph McAlexander, IV, Robert Ducharme, Ph.D., Jay Freeman, CAE USA

ECIT 3 WEDNESDAY, 4 DECEMBER • 0830 – 1000 • ROOM 320E

ECIT 3: DATA DRIVEN TRAINING: BECAUSE GUESSWORK IS SO LAST CENTURY!

Session Chair: Christina Bouwens, Booz Allen Hamilton
Session Deputy: Angela Alban, SIMETRI, Inc.

24111 Revolutionizing Simulation: Pioneering a Data-Centric Future in Defense Training Environments
Sonia von der Lippe, James Torgler, FuturaSage, LLC; John Hutt, AFAMS

24325 Lessons Learned Supplementing Instructor-Led Training with AI
John Thornton, Integration Innovation Incorporated (i3)

24470 Automated Event-Based Competency Analysis: Detecting Evidence from Training Data
Cristina Boyer, Tess Olson, Nolen Yehlik, Boeing

ECIT 4 WEDNESDAY, 4 DECEMBER • 0830 – 1000 • ROOM 320F

ECIT 4: LLM PRODUCTION AND THREAT MODELS

Session Chair: Wesley Fine, Bohemia Interactive Simulations
Session Deputy: Eugene Pursel, USSTRATCOM

24169 Bridging the Interoperability Gap Using Large Language Models and STITCHES
Javier Garza, Lockheed Martin Corporation; Sekinat Quadri

24224 Evaluating the Trustworthiness of Large Language Models for Code Generation
E. Michael Bearss, Ph.D., CMSP, Trideum Corporation

24329 Predictive Threat Models for Real-Time Decision Support
Dejan Neskovic, Alec Gray, Jr., Jerry Sheehan, Booz Allen Hamilton

ECIT 5 WEDNESDAY, 4 DECEMBER • 1030 – 1200 • ROOM 320E

ECIT 5: IT'S ALL ABOUT THE DATA

Session Chair: M. Beth Pettitt, Ph.D., U.S. Army DEVCOM SC STTC
Session Deputy: Lexie Inman, U.S. Space Force

24215 Metalog Synthetic Data Generation for Healthcare
Raul Rios, Lone Star Aerospace; Eric Haney, Ph.D., Randal Allen, Ph.D., CMSP, Lone Star Analysis

24246 Development and Evaluation of Biosensing Apparel for Monitoring Fighter Pilot Physiological Episodes
Nichola Lubold, Ph.D., Tor Finseth, Honeywell Aerospace Technologies; Rinkel Bridget, Raisa Marshall, NAWCAD

24258 A Biosensor Solution for Real-time and Prognostic Health Monitoring
Paulien Roos, Ph.D., Nathan Pickle, Ph.D., Joshua Hogue, CFD Research Corporation; JoEllen Sefton, Ph.D., Auburn University; Phillip Whitley, CFD Research Corporation

ECIT 6 WEDNESDAY, 4 DECEMBER • 1030 – 1200 • ROOM 320F

ECIT 6: GENERATIVE AI & GEOSPATIAL INTELLIGENCE

Session Chair: Tyson Kackley, MCSC/PM Wargaming Capability

Session Deputy: Karen Fray, AFRL

24106 Geomancer: Enhancing Geospatial Intelligence with a Natural Language-Assisted Mapping Interface
David Noever, Ph.D., Joseph Regian, Ph.D., PeopleTec, Inc.

24171 Model-Based Systems Engineering Approach to Model & Simulate Space Experiments Using Teamwork Cloud
Christopher Reed, U.S. Air Force

24227 Understanding Complex 4D Sonar Operating Conditions Using Virtual Environments
Ross Young, Jay Cooper, Systems Engineering and Assessment Ltd.

ECIT 7 WEDNESDAY, 4 DECEMBER • 1330 – 1500 • ROOM 320E

ECIT 7: AI AGENTS & TRAINING

Session Chair: Perry McDowell, MOVES Institute

Session Deputy: Karen Fray, AFRL

24319 Digitally Designed — Applying AI Agents to Digital Twin Development
Graham Long, Thales

24407 Mastering Digital Twins: Introducing ABoT for Cross-Disciplinary Simulation and Model-Based System Engineering
Patrick Meharg, Scott James, Andrew Dudash, Noblis, Inc.

24490 Binary Source of Truth: Leveraging Digital Twins to Enable Agile Systems Engineering
Kyle Simmons, Cavrnus

ECIT 8 WEDNESDAY, 4 DECEMBER • 1330 – 1500 • ROOM 320F

ECIT 8: AI FOR SYNTHETIC ENVIRONMENT GENERATION

Session Chair: Rishabh Kaushik, Collins Aerospace, Inc.

Session Deputy: Matt Canonico, NVIDIA

24102 Electrooptical Image Synthesis from SAR Imagery Using Generative Adversarial Networks
Grant Rosario, David Noever, Ph.D., PeopleTec

24186 Generative AI-powered 3D-Content Creation for Military Training
Eduardo Barrera, Charles River Analytics; Deepak Haste, Michael Renda, Sudipto Ghoshal, Ph.D., Qualtech Systems, Inc.; Jason Wong, Ph.D., Naval Information Warfare Center Pacific

24210 More Than a Kid's Toy: Using NeRF to Create 3D Models
Graham Webster, Hunter Stinson, Integration Innovation Inc.

ECIT 9 WEDNESDAY, 4 DECEMBER • 1530 – 1700 • ROOM 320E

ECIT 9: FOUNDATION MODELS AND HUMAN-AI INTERACTION

Session Chair: COL Paul Kwon, M.D., USA, U.S. Army PEO STRI

Session Deputy: Erica Dretzka, OSD Chief Digital and AI Office

24304 From Fascinations with Foundation Models to a Useful Conversational AI Application
Cheong Ang, IBM

24315 SAR-AR: Adapting Human Vision to Complex Sensing Technologies with Adaptive Synthetic Aperture Radar Image Recognition Training
David Nelson, USC Institute for Creative Technologies; Kimberly Pollard, Ben Files, Brent Lance, U.S. Army DEVCOM Army Research Lab; Benjamin Nye, Rhys Yahata, Mark Core, Spencer Lin, USC Institute for Creative Technologies

24366 A Human Digital Twin Architecture for Knowledge-based Interactions and Context-Aware Conversations
Carolina Cruz-Neira, Ph.D., Grace Bochenek, Ph.D., Jason Ortiz, Ph.D., Abdul Mannan Mohammed, Azhar Ali Mohammad, Carsten Neumann, Dirk Reiners, University of Central Florida

ECIT 10 THURSDAY, 5 DECEMBER • 0830 – 1000 • ROOM 320E

ECIT 10: AI TRUST AND OPTIMIZATION

Session Chair: Matt Canonico, NVIDIA

Session Deputy: Lloyd Kleinman, Surface Combat Systems Training Command

24264 Mapping Trust in AI: Right Tool, Right Task
Connor Baugh, Kyle Camlic, Charles Etheredge, William Marx, Ph.D., CAPT Tim Hill, USN (Ret.), Chanler Cantor, Intuitive Research and Technology Corporation

24335 Compound AI Ecosystem: Agents and Tools to Improve Training and Learning
Svtilana Volkova, Ph.D., Summer Rebensky, Ph.D., Laura Cassani, Robert McCormack, Ph.D., Adam Fouse, Ph.D., Sylvain Bruni, Gabe Gangberg, Kara Orvis, Ph.D., Aptima, Inc.

24344 AI-driven COA Generation Using Neuro-symbolic Methods
Rob Hyland, Michael Harradon, Charles River Analytics

ECIT 11 THURSDAY, 5 DECEMBER • 0830 – 1000 • ROOM 320F

ECIT 11: SYNTHETIC DATA & AI FRAMEWORKS

Session Chair: Mike Lokuta, CAE

Session Deputy: Erica Dretzka, OSD Chief Digital and AI Office

24206 Next-Generation Training with Advanced Visualization and Digital Twins
Ashley Stowe, Ph.D., Oak Ridge Enhanced Technology and Training Center; David Metcalf, Ph.D., UCF Institute for Simulation & Training; Michael Eakins, UCF Institute of Simulation and Modeling

24217 A Machine-readable Narratological Approach to the Design of Human Performance Descriptions for Synthetic Training Environments
Shelly Blake-Plock, Yet Analytics, Inc.; Andy Johnson, Advanced Distributed Learning (SETA Contractor); Cliff Casey, Yet Analytics

24301 Modular Analytics Framework for Rapid AI/ML Training and Deployment
Ronald Deiotte, Lauren Britton, ISSAC, LLC

ECIT 12 THURSDAY, 5 DECEMBER • 1030 – 1200 • ROOM 320E

ECIT 12: ADVANCED AI TECHNIQUES FOR RISK AWARE FLIGHT CONTROL & COMBAT OPTIMIZATION

Session Chair: Keith Holt, Lockheed Martin Corporation

Session Deputy: Crysta Maraj, Ph.D., UCF/IST

24219 Mastering Air Combat, Using Neural Fields for AI Introspection
George Hellstern, Rachael Shudde, Lockheed Martin Corporation; Joaquin León, German Barreto, Orlando Avila-García, Javier Rodríguez Vázquez, ARQUIMEA

24255 Uncertainty Aware Distributional Ensemble Reinforcement Learning for Flight Control
Joseph Gleason, Ph.D., Anastacia MacAllister, Ph.D., Micah Bryant, General Atomics Aeronautical

24273 Optimization to Minimize Risks Using Continuous Asymmetric Risk Analysis
Rob Harrill, Randal Allen, Ph.D., CMSP, Nicolas Velez Camacho, Jacob Ediger, Nickalus Harrill, Lone Star Analysis

ECIT 13 THURSDAY, 5 DECEMBER • 1330 – 1500 • ROOM 320E

ECIT 13: TRAINING AND PERFORMANCE ASSESSMENT

Session Chair: Christine Plutta, NSWC PCD/PM TRASYS
Session Deputy: Sean Guarino, Charles River Analytics

24250 Use of Large Language Models in Assessing Training Performance
Brian VanVoorst, Raytheon BBN; Matthew Hackett, Ph.D., U.S. Army DEVCOM SC STTC; Nicholas Walczak, Raytheon BBN Technologies; Jack Norfleet, Ph.D., U.S. Army DEVCOM SC STTC; Charles Meissner, RTX BBN Technologies

24254 From Innovation to Integration: Data-Driven Evaluation of Modernized Training
Alexxa Bessey, Ph.D., Summer Rebensky, Ph.D., Brian Schreiber, Mark Schroeder-Strong, Ph.D., Aptima, Inc.; Steven Macut, BGI, LLC; Wink Bennett, Ph.D., Bennett Research Consulting, LLC

24471 Preparing for LSCO: M&S Approaches to Rapidly Improve Medical Training
Mark Mazzeo; Matthew Hackett, Ph.D., Bill Pike, Ph.D., U.S. Army DEVCOM SC STTC; Angela Alban, Darin Hughes, Ph.D., SIMETRI, Inc.

HUMAN PERFORMANCE, ANALYSIS AND ENGINEERING

HPAE 1 TUESDAY, 3 DECEMBER • 1400 – 1530 • ROOM 320C

HPAE 1: VIRTUAL FUSION: REAL-WORLD APPLICATIONS OF XR

Session Chair: LCDR Michael Natali, Ph.D., USN, ONR
Session Deputy: Raquel Duran, U.S. Army PEO STRI

24185 Utilizing Extended Reality Usability Heuristics to Drive Effective XR Training Applications
Jessyca Derby, Claire Hughes, JoAnn Archer, Design Interactive, Inc.

24161 Interaction Design for Binary Reverse Engineering in Virtual Reality
Dennis Brown, Julian Bauer, Kevan Baker, Luke Wittbrodt, Samuel Mulder, Ph.D., Auburn University

24187 Virtual Reality Cue Exposure Therapy System
Derek Chong, Saravana Kumar, Ph.D., Terence Teng, Meng Fai Ying, Home Team Science and Technology Agency; Eng Hao Loh, Renee Li, Singapore Prison Service; Xiang Long Cheng, Ministry of Home Affairs

HPAE 2 TUESDAY, 3 DECEMBER • 1600 – 1730 • ROOM 320C

HPAE 2: COGNITIVE CHAOS AND SKILLFUL SWAGGER

Session Chair: Paul Andrzejewski, HigherEchelon, Inc.
Session Deputy: Claire Hughes, Design Interactive, Inc.

24201 Assessing Cognitive Workload Prediction Models Using a Continuous Subjective Approach
Charles Rowan, Ph.D., The MOVES Institute, Naval Postgraduate School

24281 Enhancing a Piloting Task Simulator with Real-time Performance Feedback, Autopilot Disruption, Shock Punishment, and Adaptive Task Difficulty
Aaron Novstrup, Stottler Henke Associates, Inc.; Monica Tynan, Jonathan Lin, J.D., James Heaton, Massachusetts General Hospital

24164 Systematic Approach to Upskilling Learning Professionals for the Development of Modernized Training
LCDR Christie Smith, U.S. Coast Guard; Courtney Zollicoffer, CG Force Readiness Command, Training Division

HPAE 3 WEDNESDAY, 4 DECEMBER • 0830 – 1000 • ROOM 320C

HPAE 3: XR: IT'S NOT JUST ABOUT FLAPPING YOUR ARMS

Session Chair: Matthew Stone, NAWCAD
Session Deputy: Susan Harkrider, C5ISR RTI

24240 B-52 Pilots in Focus: Human Factors in Virtual Reality Research
Lindsay Gouedy, Mary Fendley, Ph.D., Louisiana Tech University; Lt Col Brandon Wolf, USAF, 93rd Bomb Squadron

24265 Integrating Cognitive and Skills Training in a Simulated UAS (Unmanned Aerial Systems) Pilot Training Course
Madison Clausen, Bailey Miller, Eric Bird, Tye Payne, Lone Star UAS Center of Excellence and Innovation

24437 Spatial Accuracy Requirements for Visual Search Cues in Simulated Sparse and Dense Scenes
John Graybeal, Ph.D., U.S. Army C5ISR Center; Colleen Gerrity, MAG Aerospace; William Sharp, Planned Systems International; Emily Lasko, Ph.D., CACI International, Inc.; Todd Du Bosq, Ph.D., U.S. Army C5ISR Center

HPAE 4 WEDNESDAY, 4 DECEMBER • 1030 – 1200 • ROOM 320C

HPAE 4: DATA-DRIVEN INITIATIVES FOR TRAINING AND TEAM DYNAMICS

Session Chair: Annie Robinson, Overmatch, Inc.
Session Deputy: Elizabeth Tygart, PM TRASYS

24146 Data Collection, Reduction and Analysis Initiative for Integrating U.S. Army Data Plan into Warfighter Qualifications
Kevin Owens, Kevin Gupton, Applied Research Laboratories: The University of Texas at Austin; Randall Spain, Ph.D., Benjamin Goldberg, Ph.D., U.S. Army DEVCOM SC STTC; Ross Brown, Applied Research Laboratories: The University of Texas at Austin

24242 Taking a Data-Informed Approach to Squad Training Evaluations
Michael King, Ph.D., Julian Abich, IV, Ph.D., Quantum Improvements Consulting; Clifford Hancock, Meghan O'Donovan, U.S. Army DEVCOM SC STTC; Gregory Goodwin, Ph.D., CCDC-SC

24305 Studying Team Effectiveness via Dialogue Analysis
Kallirroi Georgila, Ph.D., Carla Gordon, Anton Leuski, Ph.D., Ron Artstein, Ph.D., David Traum, Ph.D., USC Institute for Creative Technologies

HPAE 5 WEDNESDAY, 4 DECEMBER • 1330 – 1500 • ROOM 320C

HPAE 5: IS HAL YOUR PAL?

Session Chair: Sean Carey, USAF/AMC/A3TD

Session Deputy: Bethany Brant, USAF DoD, AFLCMC/WNSE

24428 Multimodal Machine Learning Framework for Soldier Fatigue Prediction
Louis Kim, Ryan Dougherty, Connor Diehl, Kelly Hale, Ph.D., Andrea Webb, Ph.D., Draper; Hope Mango, The Johns Hopkins University Applied Physics Laboratory; Victoria Bode, Seth Elkin-Frankston, Ph.D., U.S. Army DEVCOM SC STTC

24443 Training Individual ML Classification Models of Warfighter State with fNIRS
Olivia Fox Cotton, Justin Morgan, Lisa Lucia, Ph.D., William Dupree, Ph.D., Jordan Coker, Matthew Ewer Aptima, Inc.; LCDR Joseph Geeseman, Ph.D., USN, NAWCAD

24268 Towards a Real-Time Model of Trust in Human-Machine Team Paradigms
Sydney Gibbs, Veronica Tanner, Eric Larson, Ph.D., Southern Methodist University; Sandro Scielzo, Ph.D., Alvin Abraham, CAE USA

POLICY, STANDARDS, MANAGEMENT AND ACQUISITION

PSMA 1 WEDNESDAY, 4 DECEMBER • 0830 – 1000 • ROOM 320G

PSMA 1: STREAMLINING DIGITAL ASSET MANAGEMENT

Session Chair: Jeff Frost, EWA / S3 LLC

Session Deputy: Jong Lee, Yulista Tactical Services, LLC

24172 Comparison of Intermittent Demand Forecasting Methods in Predicting the Repair of Simulators Based Upon System State
Corey Hendricks, D.Eng., Leidos

24359 Improving Training and Education Supply Chains by Harnessing Data Pipeline Observers
Erica Dretzka, OSD Chief Digital and AI Office; Brent Smith, Advanced Distributed Learning Initiative; Jason Weiss, TestifySec, Inc.

24418 When to Embrace Redundancy: Practical Guidance for Managing Digital Assets
Rowland Darbin, Mike Tyler, Steve Harvey, General Dynamics Mission Systems; Marwane Bahbaz, U.S. Army PEO STRI

PSMA 2 WEDNESDAY, 4 DECEMBER • 1030 – 1200 • ROOM 320G

PSMA 2: AI: FACT OR SCIENCE FICTION?

Session Chair: Paul Butler, The MITRE Corporation

Session Deputy: Michael Aldinger, HII / LVC Solutions Group

24109 Wargaming: Toward the Development of a Generative AI for Weather Simulation
Hung Tran, Michael Tillett, Howard Cheung, CAE USA

24114 The Boyd Loop Explanation of Artificial Intelligence for Policy Makers
Thomas Yanoschik, CMSP, Peter Jones, SAIC

24331 Leveraging Science Fiction Case Studies to Specify Immersive Training System Requirements
Lee Lacy, Ph.D., CMSP, Soar Technology, LLC; Ron Sparks, Avanade

PSMA 3 WEDNESDAY, 4 DECEMBER • 1330 – 1500 • ROOM 320G

PSMA 3: MEDICAL LEARNING: STANDARDS REQUIRED?

Session Chair: Tim Cooley, Dynamx Consulting

Session Deputy: Rick Goree, Akima, LLC

24112 Data Analytic Considerations for Audio, Video, and Simulation Trace Data: Enabling Decisional Advantage
Jennifer Winner, 711th Human Performance Wing; Cameron Roudebush, Aptima, Inc.; Randall Spain, Ph.D., U.S. Army DEVCOM SC STTC; Ian Davis, BAE Systems; Katelyn Kay, Kent Etherton, Ph.D., 711th Human Performance Wing; Erin Baker, NAWCTSD; F. Erick Robinson, Ph.D., Naval Medical Research Unit – Dayton; Benjamin Goldberg, Ph.D. U.S. Army DEVCOM SC STTC

24200 Medical Modularity and Interoperability: How Will We Get There?
M. Beth Pettitt, Ph.D., Jack Norfleet, Ph.D., U.S. Army DEVCOM SC STTC

PSMA 4 WEDNESDAY, 4 DECEMBER • 1530 – 1630 • ROOM 320G

PSMA 4: DATA DISTINCTION IN OUR DIGITAL WORLD

Session Chair: Scott Schutzmeister, Institute for Defense Analyses

Session Deputy: Patrick Hart, U.S. Army DEVCOM SC STTC

24204 An Open Standards Data Model and Taxonomy to Enable Digital Twins for Defense
Patrick Buckley, Ph.D., Integration Innovation, Inc. (i3); Robert Proctor, Jr., Real-Time Innovations

24333 Policies Motivating the Data Mesh
Erica Dretzka, OSD Chief Digital and AI Office

PSMA 5 THURSDAY, 5 DECEMBER • 0830 – 1000 • ROOM 320G

PSMA 5: THE HUMAN ELEMENT: TRAINING, POLICY AND STANDARDS

Session Chair: Sean Osmond, CMSP, Soar Technology, LLC

Session Deputy: Jennifer "JJ" Walcutt, Ph.D., SAIC

24256 What is an M&S Expert? Clarifying Competency Expectations in the DAF's Modeling and Simulations Workforce: A Case Study
Patricia Bockelman, Ph.D., Anne Little, Ph.D., Lara Bove, SAIC

24154 Generalizable Learning Engineering Adoption Maturity Model
Jim Goodell, QIP; Shelly Blake-Plock, Yet Analytics, Inc.; Scotty Craig, Ph.D, Arizona State University; Erin Czerwinski, Carnegie Mellon University/Open Learning Initiative; Jodi Lis, Arizona State University/ Learning Engineering Institute; Katherine McEldoon, Ph.D., Federation of American Scientists; Kevin Owens, Applied Research Laboratories: The University of Texas at Austin; Julian Stodd, Sea Salt Learning Ltd.; Sae Schatz, Ph.D., Partnership for Peace Consortium; Wendy Walsh, Ed.D., USAF AETC

24181 Automated Human Performance Measurement: Standardizing Lifelong Learning Training Data
Mitchell Tindall, Ph.D., Beth Atkinson, NAWCTSD; Sarah Beadle, Ph.D., NAWCAD

PSMA 6 THURSDAY, 5 DECEMBER • 1030 – 1200 • ROOM 320G

PSMA 6: DIGITAL ENGINEERING: EMBRACE THE CHANGE

Session Chair: Jeremy Gneiting, U.S. Army DEVCOM-AvMC
Session Deputy: Brian Adkins, U.S. Army DEVCOM-AvMC

24274 Implementing MBSE Organizational Change at the USAF Simulators Division
Joseph Doak, Tangram Flex; Mohammed Khattab, SAIC; Andrew Frost, Tangram Flex; Sameep Singh, Plexsys; George Ayers, Jr., U.S. Air Force

24275 Digital Sustainment, A Strategy For Success
George Ayers, Jr., U.S. Air Force; Joseph Doak, Timothy Smith, Alexander Staton, Tangram Flex; Mohammed Khattab, SAIC

24457 DoD Instruction 5000.97 – Digital Engineering: Assessing the Impact on the Department's M&S Enterprise
Daniel Hettema, Jeff Nartatez, Keith Henry, OUSD R&E Digital Engineering Modeling & Simulation

PSMA 7 THURSDAY, 5 DECEMBER • 1330 – 1500 • ROOM 320G

PSMA 7: MANAGERIAL CHALLENGES: THE GOOD, THE BAD AND THE UGLY!

Session Chair: E. Michael Bearss, Ph.D., CMSP, Trideum Corporation
Session Deputy: Steven Godby, AFLCMC/WNS

24151 Exploiting Experimentation: A Managerial Challenge
S.K. "Sue" Numrich, Ph.D., CMSP, IDA

24294 Achieving Accreditation Utilizing Model Development Indices and Model Description Reports
Glenn Peterson, Ph.D., Branford McAllister, U.S. Air Force; Steve Butler, Kerry Neace, Applied Physics Lab; Jack Borah, Borah Enterprises, LLC

24422 Preventing and Handling Offensive Behavior in Military Training
Peter Sjoestedt, Ninette Fridahl, Danish Ministry of Defence, Acquisition and Logistics Organization (DALO)

SIMULATION

SIM 1 TUESDAY, 3 DECEMBER • 1400 – 1530 • ROOM 320B

SIM 1: THE FUTURE OF MODELING HUMAN ELEMENTS IN SIMULATION

Session Chair: Nathan Jones, Spinnaker Institute, Inc.
Session Deputy: Einav Kiperman, Self-Employed

24432 COMBAT-711: A Tool for Integrating Human Factors into Wargames
Megan Morris, Ph.D., Christopher Stevens, AFRL; Bella Veksler, Tier1 Performance Solutions; Emma Robin, Kevin Contreras, Booz Allen Hamilton

24339 MetaPOL: A Digital Twin for Human Patterns of Life in Indoor Secure Facilities
Chathika Gunaratne, Mason Stott, Debraj De, Ph.D., Gautam Thakur, Chris Young, Oak Ridge National Laboratory

24368 Behavior Envelopes for Defining Performance Metrics in Complex Scenarios
Henry Phillips, IV, Ph.D., Advanced Distributed Learning (ADL) Initiative; Randolph Jones, Ph.D., CMSP, Jeffrey Craighead, Ph.D., SoarTechnology, LLC; Michael Charlton, 2Circle Consulting; Joseph Geeseman, NAWCAD; Joseph Cohn, Ph.D., Soar Technology, LLC; Lorraine Borghetti, AFRL

SIM 2 TUESDAY, 3 DECEMBER • 1400 – 1530 • ROOM 320D

SIM 2: CYBER & SECURITY

Session Chair: Jonathan Rowe, North Carolina State University
Session Deputy: Thomas Kehr, Ph.D., Cole Engineering Services, Inc.

24208 Fortifying the Virtual Battlefield: Integrating Cyber Effects Using Simulation
Matthew Smith, DSTL

24269 Development of a Novel Architecture for Improving Cyber-Kinetic Training
Omar Hasan, Derek Crane, Jeffrey Welch, Dignitas Technologies; Jeff Truong, Mark Evans, The MITRE Corporation; James Geddes, Jason Strauss, U.S. Army DEVCOM SC STTC; William Bogler, Cyber Resiliency & Training (PdM CRT)

24189 Zero Trust Security in Cloud-based Simulation
Tom van den Berg, Patric Stout, Luca Morgese, TNO

SIM 3 TUESDAY, 3 DECEMBER • 1600 – 1730 • ROOM 320B

SIM 3: BUILDING THE DIGITAL WORLD – PART 2

Session Chair: Craig Unrath, CMSP, Trideum Corporation
Session Deputy: Tiffany Parrish, NAWCTSD

24464 Open-Source MARL for Autonomous Agent Research: A New Godot-based Environment for BVR Air Combat Simulation
Andre Kuroswiski, Brazilian Air Force; Annie Wu, Ph.D., University of Central Florida; Angelo Passaro, Instituto de Estudos Avançados

24460 Establishing Best Practices to Apply a Generic Point Cloud Model (GPM) Uncertainty to High Resolution Data
Amy Neuenschwander, Ph.D., Center for Space Research; Lori Magruder, Dept. of Aerospace Engineering; Donald Maze-England, Eric Guenther, Center for Space Research; Thomas Bakewell, University of Texas at Austin

24328 Computer-Generated Forces Team Behavior within Air Combat Simulations: Concept and Agent Structure
Fabian Reinisch, Philippe Ruther, Luca Winkler, Michael Strohal, Peter Stütz, University of the Bundeswehr Munich

SIM 4 TUESDAY, 3 DECEMBER • 1600 – 1730 • ROOM 320D

SIM 4: MULTI-DOMAIN SIMULATION

Session Chair: LtCol Matthew Morse, USMC, TECOM
Session Deputy: Kanit Dararutana, U.S. Army DEVCOM-AvMC

24139 Requirements for Simulation of the Future Operating Environment and Multi-Domain Operations
Per-Idar Evensen, Even Hvinden, Ph.D., Helene Holhjem, Daniel Tveit, Karolina Eikås, Norwegian Defence Research Establishment (FFI)

24158 Open-Vocabulary High-Resolution 3D (OVHR3D) Data Segmentation and Annotation Framework
Jiuyi Xu, Meida Chen, Andrew Feng, Ph.D., USC Institute for Creative Technologies; Yangming Shi, Colorado School of Mines; Zifan Yu, Arizona State University

24152 The Potential of LVC for Creating Air Power – Beyond Adversaries
Arjan Lemmers, Bastiaan Petermeijer, Zeeger Lubsen, Jelke van der Pal, Royal Netherlands Aerospace Centre

SIM 5 WEDNESDAY, 4 DECEMBER • 0830 – 1000 • ROOM 320B

SIM 5: MY 3D WORLD

Session Chair: Thomas Kehr, Ph.D., Cole Engineering Services, Inc.

Session Deputy: Miranda Bouldin, LogiCore Corporation

24326 Converting One World Terrain Geospatial Content to CDB
Jordan Dauble, SimBlocks.io; Thomas Kozma, Maxar; William Aycock, Joint Staff

24440 Abstracting Geo-specific Terrains to Scale Up Reinforcement Learning
Volkan Ustun, Soham Hans, Rajay Kumar, USC Institute for Creative Technologies; Yunzhe Wang, University of Southern California Department of Computer Science

24243 Mesh-as-a-Service: Automated 3D Modeling Fast as L-AI-ghtning
Mathijs Henquet, Thomas Bellucci, Chihab Amghane, Jasper Steringa, Lodewijck Foorthuis, Royal Netherlands Aerospace Centre

SIM 6 WEDNESDAY, 4 DECEMBER • 1030 – 1200 • ROOM 320B

SIM 6: VR GOOD

Session Chair: Colleen Matthews, U.S. Army PEO STRI

Session Deputy: Connie Perry, U.S. Army PEO STRI

24455 Soldier Centric Design of Mixed Reality Reconfigurable Virtual Collective Trainers
Dennis Joseph, Cole Engineering Services, Inc.

24141 Advanced Navigation Team Shipboard Simulation
Matthew Legg, Corey Guilbault, NSWC Dahlgren Dam Neck Activity

24348 Training through Simulation of Border Patrol Incidents
Geng Zhang, Michigan Engineering Services; Nathan Murray, Robert Montemayor, Booz Allen Hamilton; Syed Mohammad, DHS Science and Technology Directorate; Nickolas Vlahopoulos, University of Michigan

SIM 7 WEDNESDAY, 4 DECEMBER • 1330 – 1500 • ROOM 320B

SIM 7: CONVERSATION STARTERS: LET'S TALK ABOUT IT

Session Chair: Tammie Smiley, CMSP, Trideum Corporation/AMSO

Session Deputy: Margaret Nolan, NAWCTSD

24465 Developing a Novel UAS Flight Planning and Reconstruction Software Package
Mike Alonzo, Christine Simurda, Ph.D., Benjamin Helgeson, John Lesicko, Karl Muller, Alex De Sabatino, The Applied Research Laboratories at The University of Texas at Austin

24298 Digital Caricature: Stochastic M&S of Complex System of Systems
Ronald Deiotte, Jarrid Carroll-Frey, ISSAC LLC

24439 Top 10 DIS V8 Improvements
Lance Call, AFRL/CAE USA; Robert Murray, SimPhonics, Inc.

SIM 8 WEDNESDAY, 4 DECEMBER • 1530 – 1700 • ROOM 320B

SIM 8: BUILDING THE DIGITAL WORLD – PART 1

Session Chair: Nick Giannias, CAE

Session Deputy: Paul Bogard, AFLCMC, Simulators Division

24295 Novel Techniques for Processing Building Exteriors Captured from Photogrammetry
Scott Johnson, Scot Shiflett, Leidos; Clayton Burford, U.S. Army DEVCOM SC STTC

24317 Whole Earth Fraternal Twin Content for Flight Simulation
Daniel Lowe, Collins Aerospace

24199 Simulating the Weaponization of Public Opinion in Multi-Domain Scenarios
Jan Jaap Knobbout, Lodewijck Foorthuis, Royal Netherlands Aerospace Centre

WEDNESDAY, 4 DECEMBER • 1530 – 1700 • ROOM 320F

ZOMBIES & AI

Session Chair: Tammie Smiley, CMSP, Trideum Corporation/AMSO (Simulation)

Session Deputy: Duke Tucker, Akima, LLC (Training)

24194 TRAINING: **Expanding Access to Learning Decision-Making and Teamwork Skills Using Low Fidelity, Tabletop Games: A Measurement Approach**
Lisa Townsend, Tamara Griffith, Ph.D., Jerry Mize, U.S. Army DEVCOM SC STTC; Joan Johnston, Ph.D., Retired; Grant Johnston, Student; Jake Engel, Student

24135 ECIT: **Human-AI Common Ground for Training and Operations**
Spencer Lynn, Ph.D., Susan Latiff, Ph.D., William Norsworthy, Jr., Peter Weyhrauch, Ph.D., Charles River Analytics; Mark Turner, Ph.D., Case Western Reserve University

24232 SIMULATION: **Social Simulator Madness: Simulating Social Behavior in Dynamic Environments**
Pieter de Marez Oyens, Chihab Amghane, Royal Netherlands Aerospace Centre

SIM 10 THURSDAY, 5 DECEMBER • 0830 – 1000 • ROOM 320B

SIM 10: M&S IN WARGAMING

Session Chair: Thomas Kehr, Ph.D., Cole Engineering Services, Inc.

Session Deputy: Miranda Bouldin, LogiCore Corporation

24343 M&S as a Service Composability Lessons from NATO
Scott Gallant, Effective Applications; Robert Kewley, simlytics.cloud LLC; Tom van den Berg, TNO; Chris McGroarty, Jeremiah Long, Christopher Metevier, U.S. Army DEVCOM SC STTC

24433 Leveraging MSaaS Concepts to Enable Mission Environments: Lessons Learned
Jay Freeman, CAE USA; Mate Koch, Andreas Krupp, CAE GmbH; Sheldon Lettsome, Erik Bernheim, CAE USA

24307 Development of Closed-loop Wargaming Simulation Software: Challenges, Best Practices, and Lessons Learned
Erkin Çilden , Ismail Çetintaş, Denizcan Demirok, Büşra Toraman, Levent Şenyürek, Fatih Narman, Merve Erdemir, Ahmet Sezer, STM Defense Technologies Engineering and Trade Inc.; Halit Oguztuzun, Middle East Technical University, Department of Computer Engineering

SIM 11 THURSDAY, 5 DECEMBER • 0830 – 1000 • ROOM 320C

SIM 11: DIGITAL TWINS

Session Chair: Maj Michael Ashmore, USMC, PM TRASYS

Session Deputy: Michelle DiFalco, Tangram Flex

24133 PINNball Wizard: Conjuring Digital Twins with Physics-Informed Neural Networks
Thomas McRobie, Thales Training & Simulation

24143 Warfighter Digital Twins for Simulating Mission Performance
Paulien Roos, Ph.D., Nathan Pickle, Garrett Tuer, Ryan Middle, CFD Research Corporation; James Yang, Texas Tech University; Gary Zientara, USARIEM

24276 Digital Twins for Modeling Replacement Time for CAD/PAD
Kyle Probst, David Padula, Zachry Engel, Ph.D., Randal Allen, Ph.D., CMSP, Lone Star Analysis

SIM 12 THURSDAY, 5 DECEMBER • 1030 – 1200 • ROOM 320B

SIM 12: SOARING WITH FLIGHT SIMULATORS

Session Chair: Samuel Halverson, L3Harris Technologies

Session Deputy: Bruce Haycock, Ph.D., University Health Network – KITE

24155 Leveraging Data Center Architectures for Full Flight Simulators
Jean-Philippe Arbic, Ghislain Boivin, Nick Giannias, CAE

24380 Analyzing Visual Fidelity in Flight Simulation Software Using Game Engine with Feature Mapping
Rishabh Kaushik, Ankur Rathore, Collins Aerospace

24218 Optical See-Through Mixed Reality as a Cybersickness Mitigation Strategy in Extended Reality Helicopter Flight Simulation
Boris Englebert, Tobias Tanis, Roemer Bakker, Tanja Bos, Royal Netherlands Aerospace Centre

TRAINING

TR 1 TUESDAY, 3 DECEMBER • 1400 – 1530 • ROOM 320A

TR 1: NAVIGATING TECH HURDLES IN MILITARY TRAINING

Session Chair: Jennifer Serra, Collins Aerospace

Session Deputy: Chris Del Vecchio, U.S. Air Force

24235 Understanding Trainee Cognitive Processes in ATC Training
Thomas Bellucci, Petra Ten Hove, Maykel van Miltenburg, Emmy Gabriel, Steven Niedenzu, Thimo Willems, Ir., Daniela Pistone, Royal Netherlands Aerospace Centre

24229 A Review on Education and Training Needs for Military Space Operations
Simone Caso, Tobias Tanis, Arnaud van Kleef, Royal Netherlands Aerospace Centre

24163 A Method to Assess Barriers to Implementing Training Technologies
Blake Martin, Jerzy Jarmasz, Defence Research and Development Canada

TR 2 WEDNESDAY, 4 DECEMBER • 0830 – 1000 • ROOM 320A

TR 2: ENSURING VR TRAINING EFFECTIVENESS: APPROACHES AND EXAMPLES

Session Chair: Brett Ulander, Psy.D., Bluedrop USA, Inc.

Session Deputy: Ginger Watson, Ph.D., Old Dominion University

24188 VR Team Training for Military Special Forces
Frank Jaspers, Technical Test Center

24369 A Novel Immersive Approach for Spatial Disorientation Training
Maria Chaparro Osman, Ph.D., Aptima, Inc.; Cherrise Ficke, Florida Institute of Technology; Joseph Cohn, Ph.D., Lauren Glenister, Soar Technology, LLC; Shawn Weil, Ph.D., Aptima, Inc.; Beth Atkinson, NAWCTSD

24244 Virtual Reality Training for In-air Refueling
Lindsay Gouedy, Mary Fendley, Louisiana Tech University; Brandon Wolf, USAF/93rd Bomb Squadron

TR 3 WEDNESDAY, 4 DECEMBER • 1030 – 1200 • ROOM 320A

TR 3: IMPROVE COMBAT READINESS THROUGH DIGITALIZATION

Session Chair: Marwane Bahbaz, U.S. Army PEO STRI

Session Deputy: Eric Carrasco, PM TRASYS

24148 Integration of First Person View Drones in Simulation
Peter Hafeneder, Thales

24334 A Statistical Method for Non-Laser-Based Force-on-Force Training Systems
Travis Hillyer, U.S. Army DEVCOM SC STTC

24323 Future Combat Training System – Improved Live Fire Training by Digitalization
Sebastian Hess, Fraunhofer EMI; Frank Jaspers, Technical Test Center; Thierry Fredrich, Fraunhofer EMI

TR 4 WEDNESDAY, 4 DECEMBER • 1330 – 1500 • ROOM 320A

TR 4: TAILORED TRAINING SOLUTIONS FOR HIGH-RISK PROFESSIONS, INSIGHT FROM FIREFIGHTING, AVIATION AND PARACHUTING

Session Chair: James Pharmer, Ph.D., NAWCTSD

Session Deputy: Luis Velazquez, Marine Corps Systems Command

24162 Simulation Training for High Stress Environments in the Fire Service
Jonathan Boyd, Allen Fire Department

24179 Optimizing Simulation Fidelity for Cost-Effective Aviation Training
Mark Zais, Patricia Sowles, James Zepp, Frank Turinsky, Integration Innovation, Inc. (i3)

24212 Investigating Field of Regard Implications in Simulated Parachute Descent Training
Jenna Korentsides, Embry-Riddle Aeronautical University; Victoria Trabysh, AETC; Emily Rickel, Ph.D., Matthew Pierce, NAWCTSD; Barbara Chaparro, Ph.D., Joseph Keebler, Ph.D., Embry-Riddle Aeronatical University; Beth Atkinson, NAWCTSD

TR 5 WEDNESDAY, 4 DECEMBER • 1530 – 1700 • ROOM 320A

TR 5: BRIDGING THE GAP IN TRAINING THROUGH TECHNOLOGY

Session Chair: Julie Suereth, PM TRASYS

Session Deputy: Paul Horning, USSOCOM Directorate of Operations; Joint Training and Exercise Division (J37)

24121 Training Effectiveness of a VR HMD-based Simulator in Air Force Pilots
Ramy Kirollos, Wasim Merchant, DRDC Toronto

24236 The Digital Divide: Implications for Training and Education
Maureen Namukasa, Alita Regi, Weronika Dymanus, Isabella DeLoach, TJ OConnor, Meredith Carroll, Florida Institute of Technology

24430 Technological Fluency: A First Step in Rethinking Army Training
Julia Brown, Werner Born, Ph.D., Krista Ratwani, Aptima, Inc.; Michael Mackay, Nikki Stoneley, Evan Good, HumRRO; Andrew Naber, Margaret Toich, Kyle Benbow, Army Research Institute

TR 6 WEDNESDAY, 4 DECEMBER • 1530 – 1700 • ROOM 320C

TR 6: HOW AI IS TRAINING US!

Session Chair: Philippe Perey, CAE

Session Deputy: Tim Woodard, NVIDIA

24374 LLM-Enabled Real Time Training Content Curation to Enhance Performance
James King, John Carney, MARi, LLC; John Stamper, Christine Kwon, Carnegie Mellon University; Nancy Belmont, MARi, LLC

24377 Separating Myth from Method: The AI Revolution in Military Training
Jenna Tuck, Bohemia Interactive Simulations

24414 A Deeper Dive into Using Machine Learning for Discovering the Root Causes for Student Failures Using Experience API (xAPI)
Paul Jesukiewicz, PowerTrain; Jim Bilitski, Ph.D., University of PIttsburgh at Johnstown; Jonathan Poltrack, Veracity

TR 7 THURSDAY, 5 DECEMBER • 1030 – 1200 • ROOM 320A

TR 7: DARTS, STICKS, AND DIGITAL DOMINANCE

Session Chair: Hunter Stinson, Integration Innovation Inc.

Session Deputy: Mike Merritt, NAWCTSD

24150 Operation: D.A.R.T (Designing Augmented Reality for Transfer) Improving Preparedness for Basic Combat Training Candidates
Christopher Webb, U.S. Army; Maria Harrington, University of Central Florida

24157 Surpass the Adversary: Enhanced Mission Training through Digital Engineering
Viruben Watson, Thales

24320 How to Make Military Training STICK (Superior Task Implementation of Core Knowledge)
Richard Arnold, Arnold Performance Training Group, LLC

TR 8 THURSDAY, 5 DECEMBER • 1030 – 1200 • ROOM 320C

TR 8: COGNITIVE COLLABORATORS, TASKS AND TEAMWORK

Session Chair: Jonathan Schlueter, Prisms of Reality

Session Deputy: Alex Gray, NAWCAD

24238 Development and Testing of Extended Reality Input Modalities for a Virtual Learning/Training Task
Stephanie Fussell, Ph.D., Kent State University; Quintin Oliver, AFRL; Benjamin Kwasa, Kent State University

24283 Enabling Effective Training with Mission Partners Using Resilient Multilevel Architectures
Jennifer Lewis, CMSP, Diana Pineda, CMSP, Iain Ferguson, SAIC

24324 Development of Team Dynamic Measurement Framework Using Hybrid Cognitive Task Analysis
Kamala Avancha, Parkhi Malhotra, Jamie Gorman, Vipin Verma, Arizona State University; Randall Spain, Ph.D., Benjamin Goldberg, Ph.D., U.S. Army DEVCOM SC STTC; Scotty Craig, Arizona State University

TR 9 THURSDAY, 5 DECEMBER • 1330 – 1500 • ROOM 320A

TR 9: TECH DONE RIGHT

Session Chair: Wendy Johnson, U.S. Air Force

Session Deputy: Jason Echols, Lockheed Martin Corporation

24365 A Suite of Devices: Applying Immersive Learning Taxonomy and Flow Theory to Military Training Program Device Acquisitions
Victoria Snow, U.S. Air Force; Andrew Clayton, USAF Air University

24361 Behavior-based Performance Optimization in Emerging Training Environment
Peyton Bailey, Audrey Zlatkin, Ph.D., Costas Koufogazos, Gwen Campbell, William Rivera, Design Interactive. Inc.

24262 Enhancing Air Force Training: A Data Integration Framework
Eric Haney, Ph.D., Lone Star Analysis; Mark Schroeder-Strong, Ph.D., Samantha Emerson, Ph.D., Aptima, Inc.

TR 10 THURSDAY, 5 DECEMBER • 1330 – 1430 • ROOM 320C

TR 10: FUTURE FRONTLINES: ENHANCING MILITARY TRAINING AND HEALTHCARE WITH DIGITAL INNOVATION

Session Chair: Benjamin Goldberg, Ph.D., U.S. Army DEVCOM SC STTC

Session Deputy: Hung Tran, CAE USA

24288 Training Effectiveness for Mobile Extended Reality: A Case Study Using Tactical Combat Casualty Care Training and Readiness
Betsy Laxton, JoAnn Archer, Design Interactive, Inc.

24494 Evaluation of a Novel Team-Based VR Curriculum for Advanced Resuscitative Care
Jennifer Polson, Michael Barrie, M.D., Michael Poppe, John Dorsch, D.O., Karthik Sarma, M.D., Ph.D., SimX, Inc.

HAVE QUESTIONS? ASK BLU!
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OR
SCAN THE QR CODE! →

PROFESSIONAL DEVELOPMENT WORKSHOPS

FRIDAY, 6 DECEMBER 2024 — PROFESSIONAL DEVELOPMENT WORKSHOPS

LOCATION:	Orange County Convention Center, South Concourse, note room assignments below.
DATE:	Friday, 6 December
TIMES:	0700 – 0800 Continental Breakfast and Registration 0800 – 1200 All Sessions
WHO MAY ATTEND?	All registrants of I/ITSEC are welcome to attend – I/ITSEC badge is required for entry.
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 $50 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

WORKSHOP SCHEDULE:

0700 Continental Breakfast and Registration

0800 – 1200 All Sessions

- Beyond the Basics – An Interactive "Deep Dive" into Vehicle Modeling & Simulation (M&S) Fundamentals
- Year 2 – From the Last of Us to the First of Us: Rebuilding after a Zombie Crisis
- Fundamentals of Artificial Intelligence in Simulation-based Training
- Navigating the Evolving Landscape of Distributed Simulation: Strategies for Success Using DDS
- From Zero to Hero: VR Design and Assessment for Novice-to-Expert Progression
- Serious Game Design Workshop
- Human Centered Design for Learning-Performance Integration
- Certified Modeling and Simulation Professional 3.0 (CMSP)
- Starship Bridge Simulations as a Serious Game for Team Development

PDW 2 • ROOM 331D

BEYOND THE BASICS – AN INTERACTIVE "DEEP DIVE" INTO VEHICLE MODELING & SIMULATION (M&S) FUNDAMENTALS

24W2

Presenter: Kevin Hulme, Ph.D., CMSP, The Stephen Still Institute for Sustainable Transportation and Logistics (SSISTL)

A Model is a product (physical or digital) that represents a system of interest, often for decision-making, while Simulation is the application of the model to analyze the performance of that system over time and space. This "beyond the basics" Professional Development Workshop (PDW) offers a detailed, engaging, and hands-on overview of core Modeling & Simulation (M&S) methodologies and solution approaches. The presentation serves as a "deep dive" into common mathematical formulations and solution techniques intended for the broad I/ITSEC community. For context, the PDW will begin by expanding upon fundamental M&S technologies, terms, and historical concepts. A majority of the PDW will be consumed discussing contemporary M&S through hands-on, worked examples which will be verbalized and problem-formulated, with solution strategies demonstrated using diverse mathematical approaches. MS Powerpoint and MS Excel will be utilized interchangeably throughout the presentation. In this PDW, emphasis will be placed on applications related to vehicle (ground/flight/maritime) training applications, which have served as the cornerstone of I/ITSEC since its inception. As such, Physics-based modeling will be featured as the foundational M&S solution approach. The PDW will systematically present an overview of the primary developmental subcomponents of a vehicle simulator, including: haptics/inputs/controls, vehicle dynamics basics, essentials of motion simulation, virtual environments, image generation, sound simulation, and others. The PDW will also include related introductory discussion of more recent "emerging" I/ITSEC priority concepts in M&S, including AI, machine learning, game engines, immersive displays, and extended (e.g., virtual/augmented/mixed reality techniques). Interactive content – please bring a laptop to better participate.

PDW 3 • ROOM 330GH

YEAR 2 – FROM THE LAST OF US TO THE FIRST OF US: REBUILDING AFTER A ZOMBIE CRISIS

24W3

Presenters: Tamara Griffith, Ph.D., Lisa Townsend, U.S. Army DEVCOM SC STTC; Joan Johnston, Ph.D., Retired; Grant Johnston, Student; Jerry Mize, U.S. Army DEVCOM SC STTC; Jake Engel, Student; Joseph Nolan, Magic Leap, Inc.; Richard Campanale; Chuck Wainman, SAIC

Come for the fun, stay for the insights! While I/ITSEC is well known for showcasing technical advancement that immerse individuals into simulated spaces, this workshop demonstrates that high-cost, high-fidelity simulations are not necessary to engage participants, provide teachable moments or collect insightful data. This workshop makes use of aspects of fantasy tabletop role-playing games (RPG), escape rooms,

and the zombie horror genre to build a participatory story. The story plays out to provide insights into team dynamics, leadership, trust, decision making, and strategy.

Last year's workshop was fun, well-received, and insightful. The results are provided in multiple I/ITSEC papers that summarize the data collected and describe the process of creating such an event. The format continues this year, building on the decisions participants made last year as they dealt with events in the first month following the collapse. Anyone can participate! Participants will continue to fight for their survival while considering efforts to move toward a more civilized society and their choices will continue to influence the following year's workshop as the world tries to regain normalcy after the fall. The workshop itself functions as a research study that explores data collection strategies to provide feedback on team performance, leadership strategies and the results of training interventions. As such, video cameras will be used to collect interactional data, such as who spoke to whom, what was said and how was it said.

PDW 4 • ROOM 330EF

FUNDAMENTALS OF ARTIFICIAL INTELLIGENCE IN SIMULATION-BASED TRAINING

24W4

Presenters: Brice Colby, Ph.D., Randolph Jones, Ph.D., CMSP, Morgan Ulinski, Ph.D., Soar Technology, LLC; Elaine Choy, Embry-Riddle Aeronautical University; Robert Sottilare, Ph.D., Soar Technology, LLC

This workshop provides participant experiences to help novices understand and use of various types of AI methods, design training systems with integrated AI capabilities, and evaluate demonstrations of sample AI implementations in training solutions. The authors provide hands-on opportunities for participants to use AI tools (e.g., ChatGPT, TensorFlow, WEKA & MOA) and understand the mechanisms (e.g., transformers) that make AI-based tools and models work. Significant time is also spent discussing data science as an integral practice in developing AI-based models to classify trainee behaviors, predict future simulation states, and recognize/explain the cause of events. Data science in central to human understanding of AI methods, avoiding bias in assessments, and building trust in AI methods. Interactive content – please bring a laptop to better participate. Our workshop agenda follows:

0800-0820 Artificial Intelligence Overview – Dr. Jones
0820-0840 Modeling Tr(AI)ning – Dr. Colby
0840-0925 Practical Applications of AI and Examples – Ms. Choy, Dr. Colby, Dr. Ulinski
0925-1005 Applying AI Workshop – Team
1005-1035 30 min Break
1035-1105 Workshop Discussion and Debrief – Dr. Jones
1105-1120 Ethics in AI – Ms. Choy
1120-1135 Future Directions and Challenges of AI – Dr. Jones
1135-1150 Key Takeaways and Conclusions – Dr. Ulinski

PDW 5 • ROOM 320E

NAVIGATING THE EVOLVING LANDSCAPE OF DISTRIBUTED SIMULATION: STRATEGIES FOR SUCCESS USING DDS

24W5

Presenters: Robert Proctor, Jr., David Whitten, Akkshaj Singh, Real-Time Innovations (RTI)

In this PDW, participants will embark on a comprehensive journey into the development of distributed simulators using the Object Management Group's Data Distribution Service (OMG-DDS). As the premier middleware solution for data distribution, OMG-DDS plays a pivotal role in enabling seamless communication and collaboration across distributed simulation environments. This workshop offers a unique opportunity for attendees to gain hands-on experience and practical insights into leveraging OMG-DDS to develop robust and scalable distributed simulators.

Throughout the workshop, participants will be guided through a series of interactive sessions, presentations, and hands-on exercises designed to provide a deep understanding of OMG-DDS and its application in distributed simulation. Starting with an overview of OMG-DDS fundamentals, attendees will learn how to configure OMG-DDS for distributed simulation, design OMG-DDS entities and data models, and integrate OMG-DDS with existing simulation architectures and technlogies such as game engines.

A key focus of the workshop will be on teaching participants how to harness the security and interoperability features of OMG-DDS to develop secure and reliable distributed simulators. Through real-world examples and case studies, attendees will explore best practices for implementing authentication, access control, data encryption, and integrity verification in distributed simulation environments.

Moreover, participants will gain insights into optimizing performance and scalability in distributed simulators, leveraging OMG-DDS's advanced quality-of-service parameters and real-time WAN transport capabilities to overcome the challenges of diverse network conditions.

By the end of the workshop, attendees will have acquired the knowledge and skills needed to design, develop, and deploy distributed simulators using OMG-DDS, positioning them as leaders in the field of distributed simulation. Whether you're a novice seeking to expand your expertise or an experienced practitioner looking to stay ahead of emerging trends, this workshop promises to equip you with the tools and techniques needed to succeed in the dynamic world of distributed simulation. Interactive content – please bring a laptop to better participate.

PROFESSIONAL DEVELOPMENT WORKSHOPS

PDW 6 • ROOM 331C

FROM ZERO TO HERO: VR DESIGN AND ASSESSMENT FOR NOVICE-TO-EXPERT PROGRESSION

24W6

Presenters: Jeanine DeFalco, University of New Haven; Madeleine Keehner, Brighter Research, LLC; Kristin Torrence, IEEE ICICLE

While the ability to design an effective training simulation is still a challenging task, determining whether or not the simulation is effective from a learning perspective is arguably more difficult to both design for and ascertain. The majority of training simulations today appear to address the assessment and learning validity issue by designing simulations for the novice—arguably the easiest way to address the assessment issue of training. Meaning, if someone knows nothing about a task or process, then you can infer learning took place by merely introducing a novice to a simulation with basic information. However, deploying novices into complex or chaotic work environments and missions is not the end state we should be aiming for. Rather, training simulations should be designed to support knowledge and skill development that moves a trainee from a novice to a journeyman or expert status. Determining the proficiency of a trainee beyond a novice state requires benchmarks and assessments that can provide evidence of a range of competency levels, including mastery. In this workshop, we will facilitate a hands-on-design learning experience to have participants storyboard an initial training simulation incorporating an assessment design, using a learning engineering design approach.

PDW 7 • ROOM 331A

SERIOUS GAME DESIGN WORKSHOP

24W7

Presenters: Radhakishan Shetty, JANUS Research Group; Vance Souders, Plas.md; Seth Crofton, Pocketpinata Games/Moonrock

During this workshop, participants will be introduced to key concepts, steps, and processes involved in designing a game for learning. Through hands-on activities and working together in groups, participants will work through the initial phases of the design process. Participants will identify a topic, audience, training requirements and learning objectives, creating an effective narrative, determining instructional and gaming strategies, designing key game mechanics, and choosing the appropriate delivery technology. Presenters will facilitate the groups and give examples from past experiences and provide examples from the Serious Game Showcase and Challenge.

PDW 9 • ROOM 331B

HUMAN CENTERED DESIGN FOR LEARNING-PERFORMANCE INTEGRATION

24W9

Presenters: Sydney Heimbrock, Ryan Twedell, Cydney Miller, Qualtrics

Technology offers new opportunities to fully integrate training and readiness to assure deterrence. This is why the discipline of Learning Engineering has emerged as mission critical for enabling evidence-based designs to improve learning outcomes. Harvard University's Huntington Lambert defines Learning Engineers as understanding the "who" an organization is teaching, and the "what" the learning must deliver, in order to design the "how" of learning experiences. Because humans are at the center of this challenge, the methods and tools of human centered design are critical for effective learning design, development and delivery. This workshop – which attracted standing room only attendance and was highly rated at I/ITSEC 2023 – will give participants an immersive experience in Human Centered Design (HCD) for Learning and Development. The workshop will kick off with a brief presentation framing the value, history and outcomes of HCD as it relates to the future of learning. Participants will learn and practice HCD by applying the framework, methods and tools to a real government learning experience use case. Participants will learn the four key phases of the HCD process:

- Discover
- Reframe
- Prototype, Test, Iterate
- Implement, measure and continuously improve

For each phase of the HCD process, facilitators will present the principles, methods and tools, then support participant small groups to apply them in the room to design the future of learning in their organizations. Participants will then explore how to apply HCD to digital learning ecosystems through automated qualitative data collection and analysis. Participants will leave the workshop educated, inspired and equipped to apply a human centered approach to their learning design, delivery and evaluation strategies.

PDW 11 • ROOM 320F

CERTIFIED MODELING AND SIMULATION PROFESSIONAL 3.0 (CMSP)

24W11

Presenter: Ivar Oswalt, Ph.D., CMSP, The MIL Corporation

The Certified Modeling and Simulation Profession (CMSP) certification program has been reinvented and reintroduced to the M&S community as CMSP 3.0. The certification's application process has been streamlined, the examination updated, and an approach to ensure readily available reference material developed, amongst many other additional improvements. This proposal is to conduct a CMSP 3.0 Professional Development Workshop. This four-hour session will describe the requirements needed to achieve this valuable certification. It will cover the updated application and examination processes including education, work experience, and reference requirements for the Intern, Apprentice, Practitioner, and Master Levels; application processes; how the exam is administered and scored; and the role of continuing education in certificate renewal. It will also provide an overview of the fundamental M&S topics covered in the exams and include several relevant simulation videos.

Engaging Activities: This year's CMSP PDW will now include four game-show style exercises. The first, The Type is Right, modeled after CBS's

The Price is Right, displays to the audience a quick look at the picture of a type of M&S system, that needs to be identified, an answer is provided – and then the answer is discussed. The second is a Jeopardy style game, with categories and answers/questions on salient topics, and chocolate coin prizes. Third and finally, new in 2024, is an anagram acronym crossword puzzle, where a partially completed crossword puzzle of acronyms is displayed, and attendees work to fill in the blanks, with the prize of an M&S Monograph going to the most successful contestant.

Provided by: The PDW will be led by Ivar Oswalt – a Senior M&S Expert who is CMSP Certified and has been an integral part of its reinvention, and that has provided previous CMSP PDWs.

PDW 15 • ROOM 330ABCD

STARSHIP BRIDGE SIMULATIONS AS A SERIOUS GAME FOR TEAM DEVELOPMENT

24W15

Presenters: James Benslay, Jr., The MITRE Corporation; David Hernly, Mythric Studios

It is nearly an axiom that people learn best and retain lessons better when they are fully engaged in the learning environment. We believe that a Starship Bridge Simulation (SBS) is an excellent tool to use as a serious game in a creative, fun, and engaging leadership laboratory environment to encourage leadership and resilient team development.

This SBS workshop is explicitly designed as a follow-on to the Monday tutorial of the same title, "Starship Bridge Simulations as a Serious Game for Team Development." Whereas the tutorial provided the conceptual underpinnings of an SBS and taught the basic simulation and console mechanics, this workshop will conduct an actual multi-ship, multi-crew starship simulation scenario with a structured, facilitated, After-Action Review (AAR) of the participant's performance. The workshop presenters will provide an engaging environment with computer consoles, lights, sound effects, and other appropriate elements. The presenters will likely conduct at least two separate simulations: one as a practice/introductory scenario, and a second as a more challenging scenario. A third scenario will be prepared in the event there is time. Constructive dialog and examination of scenario execution will be encouraged from all participants during the AAR.

It is not necessary to have taken the associated Monday tutorial, but it will be very beneficial to providing participants the needed introduction to consoles and mechanics. Not all attendees to the workshop need to participate as a bridge crew member. Some attendees will be needed to serve as adjunct observer/evaluators and help with the AARs. Attendees could also choose to simply observe the event.

ANNUAL I/ITSEC 5K RUN/WALK/ROLL

WEDNESDAY, 4 DECEMBER 2024

OCCC, South Concourse

0530 Packet Pickup

0645 Start Time

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

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

REGISTER BY 1 OCTOBER TO GET A SHIRT

END OF AUGUST – 1 OCTOBER (Register by 1 October to secure your shirt & medal)	$50
2 OCTOBER – 22 NOVEMBER (Shirts & medals are not available)	$50
23 NOVEMBER – 4 DECEMBER (Shirts & medals are not available)	$65

We are excited to once again be holding the I/ITSEC 5K (3.1 miles) Run/Walk/Roll to benefit the Tunnels to Towers Foundation and the I/ITSEC STEM Initiative. Come out and have a great morning of fun while you support these two great organizations!

YOU HAVE FOUR GREAT OPTIONS TO PARTICIPATE:

1. **TRADITIONAL 5K PARTICIPATION –** Get out there, watch the sun rise, and put some pavement miles under your feet.
2. **SNOOZE BUTTON –** Don't do mornings (or running)? We have you covered with this option.
3. **Virtual 5K –** Want to participate on your own time and your own location? Here is your chance! Run a distance of 5k (3.1mi) the week of I/ITSEC with a GPS enabled app (Run Keeper, Map My Run, Zombies RUN!), like us on Facebook, and tag us with #IITSEC5K.
4. **NOT INTERESTED IN RUNNING?** Make a donation instead which will go miles in supporting our great charities.

Only in-person participants receive a shirt and medal. Shirt sizes are not guaranteed. Snooze and Virtual participants do not receive a shirt or medal.

Email Sean Osmond for Race Information at **iitsec5k@gmail.com**
or Shannon Burch for Sponsorship information at **sburch@NTSA.org**

CHARITIES THE 5K WILL SUPPORT

TUNNEL TO TOWERS: Tunnel to Towers helps America's heroes by providing mortgage-free homes to Gold Star and fallen first responder families with young children and by building custom-designed smart homes for catastrophically injured veterans and first responders. Tunnel to Towers is also committed to eradicating veteran homelessness and aiding the victims of major U.S. disasters.

I/ITSEC STEM: The I/ITSEC STEM Initiative is a non-profit, 501c3 organization founded and maintained by the National Training and Simulation Association to support and promote activities encouraging students interests and pursuits of Science, Technology, Engineering, and Mathematics. For more information on this ongoing program, please visit the Education / STEM section on the I/ITSEC home page.